






“The causal effect of divorce and income inequality on crime: Evidence from Azerbaijan”

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THE CAUSAL EFFECT OF DIVORCE AND INCOME INEQUALITY ON CRIME: EVIDENCE FROM AZERBAIJAN

Abstract

Crime remains a significant socio-economic issue, shaped by social instability and economic inequality, and poses critical challenges for public administration and policymaking. In Azerbaijan, rising divorce rates and persistent income disparities have become prominent social concerns, with the former reflecting shifts in family structure and the latter captured by the Gini index as a measure of income inequality. This study explores the causal relationships between crime, income inequality, and divorce rates in Azerbaijan from 2000 to 2021, utilizing econometric methodologies. From a public administration perspective, the study provides empirical insights to support more effective and targeted interventions in crime prevention, social protection, and family policy. Methodologically, the Johansen cointegration test is applied to identify long-term equilibrium relationships among the variables, while the Toda-Yamamoto Granger causality test is employed to examine the directional causality. The cointegration analysis reveals stable long-term associations between crime, income inequality, and divorce, with trace statistics (32.172, 16.067, and 4.052) exceeding their respective critical values at the 5% significance level. Additionally, the Toda-Yamamoto test shows that income inequality significantly influences crime ($\chi^2 = 5.145$, $p = 0.023$), with divorce exhibiting a stronger predictive relationship with crime ($\chi^2 = 7.071$, $p = 0.007$). These findings underscore the necessity for integrated crime prevention strategies, emphasizing the role of public administration in designing and implementing coherent socio-economic policies.

Keywords

crime, divorce, income inequality, Gini index,
econometrics, Azerbaijan

JEL Classification

I31, D63, K42, C32

INTRODUCTION

Crime is a complex socio-economic phenomenon that significantly impacts societal stability and development. Crime is defined as the intentional commission of an act considered socially harmful or dangerous, which is specifically defined, prohibited, and punishable under criminal law, with the definitions of particular crimes in a code requiring interpretation in light of various principles, some of which may not be explicitly expressed within the code itself (Thomas et al., 2025). The analysis of fault-based crimes suggests that strict liability plays a role in regulating actions that, while not significantly blameworthy, contribute to an increased risk of harm to protected values (Lamond, 2007). A thorough examination of its underlying determinants is essential for formulating evidence-based policies aimed at mitigating criminal activity. Among the various socio-economic factors associated with crime, divorce rates and income inequality have been the focus of extensive academic inquiry. Divorce is a multifaceted issue in modern social science, carrying substantial consequences for societal stability. It has the potential to influence various types of criminal behavior, especially within the realm of domestic offenses, as

the breakdown of family structures can heighten interpersonal conflicts and contribute to a rise in violence and other related crimes (Stolzenberg & D'Alessio, 2007).

Divorce and income inequality are significant social factors influencing crime, particularly in transition economies like Azerbaijan. Divorce can disrupt family structures and weaken social cohesion, especially in societies with strong traditional values, thereby increasing vulnerability to crime. Similarly, income inequality exacerbates social disparities and economic marginalization, contributing to criminal behavior. Understanding the interaction between these factors is essential in contexts undergoing rapid social and economic transformation. Azerbaijan's family policy, rooted in national values and historical traditions, focuses on reinforcing the family institution and ensuring the healthy development of young people. The government implements various programs designed to protect family values and improve the well-being of women and children. Furthermore, the policy aims to safeguard the social functions of the family by addressing and mitigating modern social issues (SCFWCIRA, n.d.). The preservation of family values is a key aspect of the cultural identity and longstanding traditions of the Azerbaijani people. A strong and healthy family is regarded as the foundation of Azerbaijani society, with family breakdown being seen as a primary driver of many social issues. Consequently, the family institution is highly valued by both the state and society as an essential factor in maintaining social stability. In particular, the recent rapid rise in divorce rates in Azerbaijan has intensified the urgency of addressing this issue (Nigar, 2013; Report, 2022).

The increasing crime rates in Azerbaijan, alongside rising divorce rates and persistent income inequality, raise important questions about the socio-economic drivers of criminal behavior. Given the cultural significance of the family institution and the growing concern over social cohesion, examining these dynamics within the national context becomes both timely and policy-relevant.

1. LITERATURE REVIEW

As an oil-producing country, Azerbaijan's socio-economic conditions have been heavily influenced by variations in oil prices and global inflation (Hasanov et al., 2025). Over the past two decades, the rise in divorce rates in Azerbaijan can be attributed to a combination of social, economic, and cultural factors. Notable influences include shifts in gender roles, the limited development of the non-oil sector due to growing oil revenues, an increase in labor migration, and the simplification of divorce procedures, among other contributing elements (Gulaliyev et al., 2024).

The impact of economic challenges on social life is reflected in several key factors, with income inequality, as measured by the Gini index, being one of the most significant. Numerous studies in economics and criminology have explored how income inequality contributes to higher crime rates, suggesting that wealth disparities lead to social unrest and diminished social cohesion (Fajnzylber et al., 2002; De Courson & Nettle, 2021). Higher levels of inequality foster frustration and resentment,

particularly among disadvantaged groups, which can increase the likelihood of criminal behavior. As such, addressing income inequality is essential for mitigating its negative effects on crime and overall social stability. Economic factors, such as financial stress and income inequality, have been shown to significantly impact divorce rates, as they often exacerbate marital tensions. These economic pressures can lead to dissatisfaction within relationships, increasing the likelihood of divorce (Mortelmans, 2020).

Extensive empirical evidence suggests that elevated income inequality is correlated with negative health and social outcomes, and recent research strengthens the argument for a causal connection. This association is consistent with key epidemiological standards, indicating that reducing income inequality may lead to significant improvements in public health and overall well-being (Pickett & Wilkinson, 2015). The scholarly literature examines the interplay between socio-economic factors, such as divorce, paternal criminality, and income inequality, and their influence on crime rates. The essay written by Coccia (2017) argued

that although the heat hypothesis accounts for part of the cause of violent crime, socio-economic inequality plays a more fundamental role by negatively impacting mental health and increasing aggression, even when climate factors are controlled for. Statistical evidence supported the idea that high income inequality is a significant driver of intentional homicides in both tropical and temperate regions. The findings suggested the necessity of integrating psychological and sociological approaches to inform crime prevention policies. Van De Weijer et al. (2015) investigated the impact of parental divorce and paternal criminality on offspring offending, revealing that parental divorce was associated with an increased likelihood of non-violent crime. However, the study found no significant effect on violent crime once parental violence was controlled for. Additionally, the research demonstrated that parental divorce moderated the intergenerational transmission of violence, with such transmission being evident only among children who had not experienced parental divorce. Similarly, Khamis (2016) explored the bidirectional relationship between divorce and crime in Jordan, using cross-sectional time-series data from 12 governorates over 14 years. The study found a reciprocal relationship between divorce and crime, with crime rates exerting a stronger predictive effect on divorce rates within governorates. Furthermore, divorce rates contributed to fluctuations in crime over time across different governorates, emphasizing the dynamic and interdependent nature of these phenomena.

Huhta (2012) investigated the relationship between income inequality and property crime rates across 337 Finnish municipalities from 1995 to 2009, using OLS, fixed effects, and dynamic GMM models. The findings showed a significant positive association between income inequality and theft, weaker evidence for other types of property crime, and no observed link with violent crime. The study highlighted the importance of analyzing different categories of crime separately and accounting for lagged effects through dynamic modeling.

Yob et al. (2022) extended this analysis by examining the relationships between divorce, unemployment, poverty, inflation, economic growth, and child abuse in Malaysia. The study found that while divorce and poverty did not have a signifi-

cant long-term effect on child abuse, short-term positive associations were observed between divorce, economic growth, and unemployment with child abuse. These findings underscore the importance of social support systems in mitigating family stress and reducing the risks of child abuse in the short term. Cáceres-Delpiano and Giolito (2012) focused on the effects of unilateral divorce laws on violent crime, particularly among young adults who had experienced parental divorce during childhood. Their analysis, covering the period between 1965 and 1996, found a 9% increase in violent crime following the implementation of these laws. The authors attributed this rise to heightened poverty and income inequality among single mothers, highlighting socio-economic factors as significant contributors to increased crime rates. Some other researchers have examined the impact of marital conflict, misconduct, and economic hardship on divorce rates and the propensity for criminal behavior. Studies focusing on marital conflict emphasize the role of economic strain, infidelity, and communication breakdowns in driving both divorce rates and the likelihood of criminal behavior, especially among vulnerable populations such as the elderly (Kang & Lim, 2013; Khajakini et al., 2024).

In the context of income inequality, Choe (2008) investigated the relationship between relative income inequality and crime in the United States, finding a strong and consistent association between income inequality and burglary and robbery rates. Scorzafave and Soares (2009) corroborated these findings, demonstrating a significant elasticity of 1.46 between income inequality and pecuniary crimes. Their study highlighted the importance of expanding job opportunities and enhancing the legal system as key measures to mitigate criminal behavior. In contrast, Pare and Felson (2014) found that when poverty was controlled for, income inequality had no significant impact on crime rates, including homicide, assault, robbery, burglary, and theft. These findings challenge the assumption that income inequality is a primary driver of crime, suggesting that poverty may be a more influential determinant in explaining criminal behavior. Atems (2020) utilized panel structural vector autoregressions (SVAR) to analyze U.S. state-level data from 1960 to 2015, investigating the effect of income inequality on

crime. The study found that structural shocks to income inequality resulted in increases in both violent and property crime. However, variance decomposition analysis indicated that income inequality accounted for only a limited portion of crime fluctuations, suggesting that other factors may play a more substantial role in influencing crime dynamics.

This paper aims to examine the long-term and causal relationships between crime rates, income inequality, and divorce rates in Azerbaijan from 2000 to 2021. It is hypothesized that:

H1: Income inequality and divorce rates both have a positive and statistically significant effect on crime rates.

H2: A long-term equilibrium relationship exists among crime rates, income inequality, and divorce rates, reflecting the interconnected nature of economic disparities, social dynamics, and criminal behavior in Azerbaijan.

2. METHOD

This study investigates the influence of divorce rates and income inequality, measured by the Gini index, on crime rates in Azerbaijan using data from 2000 to 2021. The selected timeframe reflects the most recent and complete data available from national statistical sources and international databases. In the absence of consistent and officially released data beyond 2021, this period offers the most reliable basis for empirical analysis. The key variables used in this analysis are detailed as follows.

The divorce and crime variables correspond to the annual number of divorces and criminal incidents reported in Azerbaijan. Data for these variables were sourced from the State Statistical Committee of the Republic of Azerbaijan (SSCRA, n.d.a, n.d.b), reflecting the yearly figures for legal marital dissolutions and criminal activities.

The Gini index serves as a measure of income inequality in Azerbaijan, although official data on the Gini index were not available for the study period. Gulaliyev et al. (2020) calculated the in-

dex based on their analysis of income inequality in Azerbaijan over the past twenty years. The subsequent study on income inequality involved an extended examination of the issue, with the scientific analysis of the data being further developed (Gulaliyev et al., 2023). The Gini index values derived from his work are used as the source for this variable in the current study.

Table 1 presents a summary of the key statistical characteristics of the crime, divorce, and Gini index variables, including measures such as the mean, variability, and distribution shape over the 20-year period in Azerbaijan. These statistics offer a concise comparison of the central tendency, dispersion, and symmetry of the variables. Importantly, the results of the Jarque-Bera test suggest that the distributions of crime, divorce, and the Gini index do not significantly deviate from a normal distribution.

Table 1. Data description

Statistic	Crime	Divorce	Gini index
Mean	22,305.33	10,685.86	0.461
Median	22,830.00	10,747.00	0.542
Maximum	31,131.00	17,191.00	0.743
Minimum	14,607.00	5,382.000	0.162
Std. Dev.	4,581.949	3,630.724	0.198
Skewness	-0.165	0.301	-0.381
Kurtosis	2.101	1.948	1.605
Jarque-Bera	0.801	1.28	2.209
Probability	0.669	0.525	0.331

Figure 1 illustrates the relationship between crime rates and key socio-economic indicators, namely divorce rates and the Gini index, over the period 2000–2021. The trend indicates a positive correlation, suggesting that rising divorce rates and increasing income inequality are associated with higher crime rates. This observed pattern highlights the potential influence of social fragmentation and economic disparities on the prevalence of criminal activity.

Figure 2 displays scatter plots that depict the relationship between the logarithm of crime rates (LCRIME) and the logarithm of divorce rates (LDIVORCE) in the left panel, and the logarithm of crime rates (LCRIME) and the logarithm of the Gini index (LGINI) in the right panel. The left panel shows a positive correlation between LCRIME and LDIVORCE, suggesting that regions with

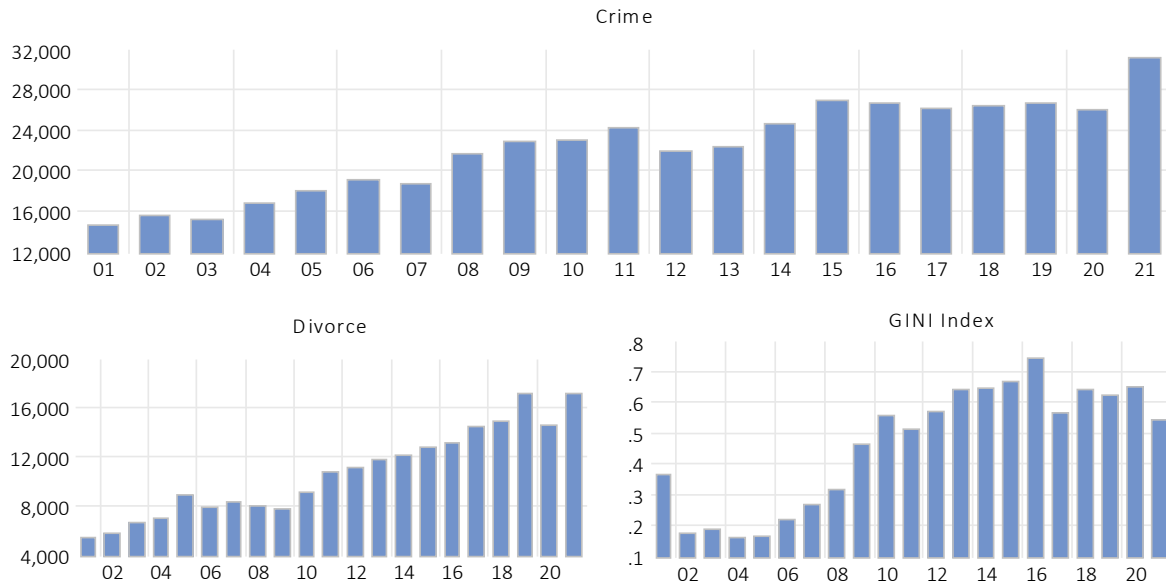


Figure 1. Trends in crime rates, divorce rates, and Gini index in Azerbaijan (2000–2021)

higher crime rates tend to have higher divorce rates. In contrast, the right panel reveals a relatively weaker relationship between LCRIME and LGINI, indicating a more nuanced and complex connection between crime rates and income inequality.

To assess the impact of divorce rates and income inequality, as measured by the Gini index, on crime rates in Azerbaijan, this study utilizes a vector autoregressive (VAR) model. The VAR framework enables the estimation of Granger (1969) causality between the variables, facilitating the identification of causal relationships over time. Granger causality tests are conducted under the

assumption that the data series are stationary at levels, which is confirmed through a unit root test.

When the variables are found to be non-stationary in levels, the Toda-Yamamoto (Toda & Yamamoto, 1995) approach is employed, which accounts for the integration of the variables and provides more reliable results in such cases. For the application of this approach, the optimal lag length (K) and maximum order of integration (D_{max}) are first determined. Afterward, the model is specified by using $K + D_{max}$ lags. The equations of the Toda-Yamamoto model, adapted for the dataset utilized in this study, are expressed as follows:

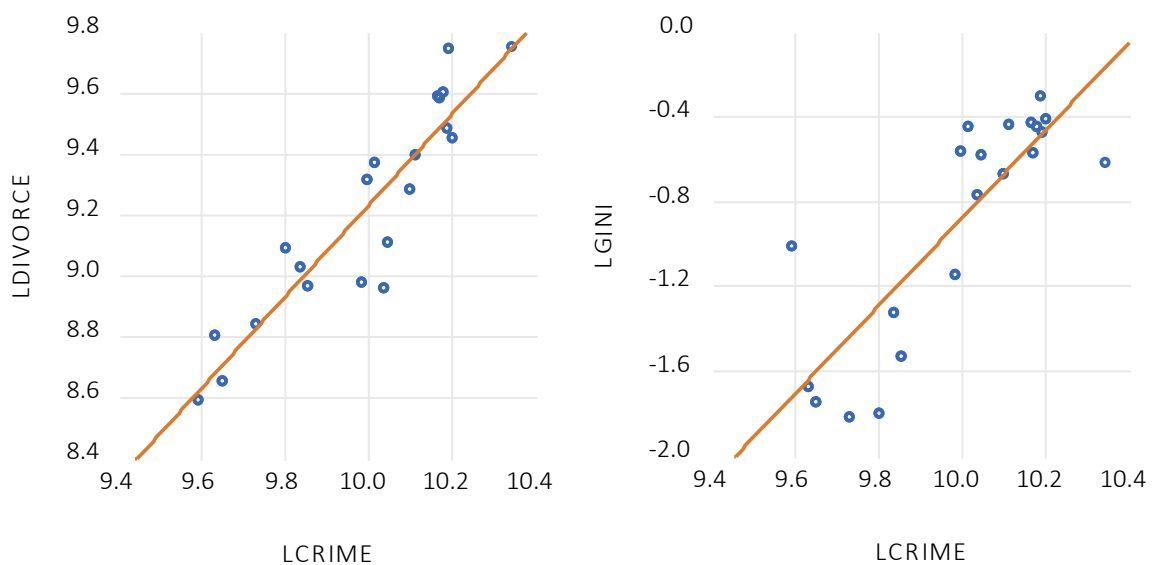


Figure 2. Scatter plots of crime rates, divorce rates, and the Gini index

$$\begin{aligned}
 Crime_t &= \alpha_0 + \sum_{i=1}^k \alpha_i Crime_{t-i} \\
 &+ \sum_{j=k+1}^{k+d_{max}} \alpha_j Crime_{t-j} + \sum_{i=1}^k \phi_i Divorce_{t-i} \quad (1) \\
 &+ \sum_{j=k+1}^{k+d_{max}} \phi_j Divorce_{t-j} + v_{1t},
 \end{aligned}$$

$$\begin{aligned}
 Crime_t &= \alpha_0 + \sum_{i=1}^k \alpha_i Crime_{t-i} \\
 &+ \sum_{j=k+1}^{k+d_{max}} \alpha_j Crime_{t-j} + \sum_{i=1}^k \phi_i Gini index_{t-i} \quad (2) \\
 &+ \sum_{j=k+1}^{k+d_{max}} \phi_j Gini index_{t-j} + v_{1t}.
 \end{aligned}$$

Furthermore, the study includes the Johansen cointegration test to examine the long-term equilibrium relationships among the variables. This test is essential for assessing whether a stable, long-run relationship exists between divorce rates, income inequality, and crime rates, providing deeper insights into their interconnected dynamics.

3. RESULTS

As presented in Table 2, the results of both the Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979) and Phillips-Perron (PP) (Phillips & Perron, 1988) tests indicate that all variables are non-stationary at their level form but achieve stationarity after first differencing, confirming their integration of order one (I(1)). Consequently, the maximum order of integration (*Dmax*) is identified as 1, a critical consideration for implementing the Toda-Yamamoto causality approach.

Table 2. Unit root test

Variables	Test Type	Level	1 st Difference
lcrime	ADF Test	-1.018 (0.725)	-4.312 (0.004*)
	PP Test	-0.976 (0.740)	-4.308 (0.004*)
lgini	ADF Test	-0.879 (0.773)	-5.919 (0.000*)
	PP Test	-1.007 (0.729)	-5.819 (0.000*)
ldivorce	ADF Test	-1.271 (0.620)	-6.484 (0.000*)
	PP Test	-1.022 (0.724)	-6.844 (0.000*)

Note: * Significant at 1% level.

Table 3. Optimal lag order selection

Lag	Log Likelihood (LogL)	Likelihood Ratio (LR)	Final Prediction Error (FPE)	Akaike Information Criterion (AIC)	Schwarz Criterion (SC)	Hannan-Quinn Criterion (HQ)
0	16.334	NA	4.93e-05	-1.403	-1.254	-1.378
1	63.136	73.898*	9.40e-07*	-5.382*	-4.786*	-5.281*
2	70.670	9.516	1.20e-06	-5.228	-4.184	-5.051

Table 3 reports the results of the optimal lag length selection using various information criteria, including the Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Hannan-Quinn Criterion (HQIC), among others. The optimal lag structure is determined by selecting the model that minimizes these criteria.

The determination of an appropriate lag length is essential for maintaining the validity of the Toda-Yamamoto causality approach, as it directly influences the stability and efficiency of the Vector Autoregression (VAR) model. The results indicate that the optimal lag order (*K*) is 1, which, when combined with the maximum order of integration (*Dmax* = 1), leads to an augmented VAR model with (*K* + *Dmax*) = 2 lags. This methodological framework ensures statistically robust inference in assessing the causal relationships between the Gini Index, divorce rates, and crime rates in Azerbaijan.

Figure 3 displays the inverse roots of the autoregressive (AR) characteristic polynomial, serving as a key diagnostic for assessing the stability of the estimated VAR model. For the VAR model to be considered stable, all inverse roots must lie within the unit circle, meaning their modulus should be less than one. The plotted points in the figure show that all inverse roots are located inside the unit circle, thereby confirming the stability of the VAR model. This stability is essential for ensuring that the model is dynamically consistent and appropriate for conducting inference, especially in the context of the Toda-Yamamoto causality analysis between the Gini Index, divorce rates, and crime rates in Azerbaijan.

The VAR serial correlation LM test results in Table 4 show *p*-values that are above the significance level for lags 1, 2, and 3, indicating no significant serial correlation in the residuals. This implies that the VAR model has successfully accounted for the temporal dependencies in the data.

Inverse Roots of AR Characteristic Polynomial

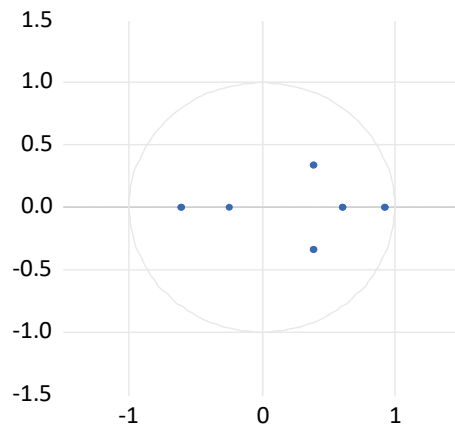


Figure 3. Inverse roots of AR characteristic polynomial

Table 4. VAR serial correlation LM test

Lag	LRE Stat	Degrees of Freedom (df)	P-Value	Rao F-stat	Degrees of Freedom (df)	P-Value
1	9.397	9	0.401	1.098	(9, 17.2)	0.413
2	12.303	9	0.196	1.551	(9, 17.2)	0.207
3	6.629	9	0.675	0.721	(9, 17.2)	0.683

Table 5 presents the results of the VAR residual normality test, where the high *p*-values for both individual components and the joint test (all exceeding 0.45) suggest that the residuals do not significantly deviate from a normal distribution. This outcome supports the validity of standard statistical inference for the VAR model. In Table 6, the VAR residual heteroskedasticity test yields a *p*-value of 0.308, indicating that the residuals exhibit constant variance over time. This homoskedasticity is favorable for ensuring efficient parameter estimation.

Table 5. VAR diagnostics

VAR residual normality test			
Component	Jarque-Bera	Df	p-value
1	0.127571	2	0.9382
2	0.456986	2	0.7957
3	1.592566	2	0.4510
Joint	2.177123	6	0.9027
VAR residual heteroskedasticity test			
Joint Test			
Chi-Square	df	p-value	
77.462	72	0.308	

Consequently, the model is regarded as well-specified and suitable for further analysis, with the residuals demonstrating the characteristics of white noise. In aggregate, these tests validate that the residuals of the VAR model comply with

fundamental assumptions, thereby reinforcing the model's reliability for subsequent analysis and interpretation.

The Johansen (1988) cointegration test results presented in Table 6 are designed to detect the presence and number of stable, long-term relationships within a multivariate time series system. The trace statistic, compared to critical values, evaluates whether the data provide evidence of cointegration, implying that although individual series may be non-stationary, specific linear combinations exhibit stationary behavior, suggesting a tendency toward a long-run equilibrium. The asterisks indicate the rejection of the null hypothesis at the 0.05 significance level, thereby supporting the existence of at least the hypothesized number of cointegrating relationships for each row marked.

Table 7 reveals the outcomes of the Toda-Yamamoto Granger causality test, investigating whether LGINI and LDIVORCE Granger cause LCRIME. The significant *p*-value for *H1* (0.023) indicates that LGINI has a predictive influence on LCRIME, while the highly significant *p*-value for *H2* (0.007) suggests a stronger predictive association between LDIVORCE and LCRIME. These findings imply that historical values of income inequality and divorce rates may provide valu-

Table 6. Johansen cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	p-value
None	0.591	32.172	29.797	0.026
At most 1	0.486	16.067	15.494	0.041
At most 2	0.201	4.052	3.841	0.044

Table 7. Granger causality test with the Toda-Yamamoto approach

Hypothesis	Variables	K	K + D _{max}	Chi-Square (χ^2)	P-Value
H1	LGINI – LCRIME	1	2	5.145	0.023*
H2	LDIVORCE – LCRIME	1	2	7.071	0.007**

Note: *significant at 5%, **significant at 1%.

able insights into forecasting current crime rates. Although Granger causality does not confirm direct causality, it highlights potential dynamic relationships that warrant further analysis, particularly in terms of policy implications.

4. DISCUSSION

This study provides empirical evidence on the socio-economic determinants of crime in Azerbaijan, emphasizing the roles of income inequality and divorce. These results are consistent with criminological and economic theories that associate social instability and economic inequality with fluctuations in crime rates. From a methodological perspective, the Toda-Yamamoto approach strengthens causal inference by accounting for nonstationarity, while the Johansen cointegration test identifies long-term equilibrium relationships among the variables. The findings highlight the necessity of comprehensive crime prevention strategies that incorporate both social and economic dimensions.

The empirical findings align with the broader literature, particularly the studies of Raja and Ullah (2013) and Zaman and Khan (2021), which emphasize the relationship between divorce, income inequality (as measured by the Gini index), and crime. Theoretical frameworks suggest that marriage serves as a stabilizing social institution that reduces criminal tendencies, particularly among men, by fostering social bonds and increasing economic security. However, while numerous empirical studies support this argument, highlighting the inverse correlation between stable marriages and criminal behavior, the causal mechanism remains a subject of debate. Skardhamar et al. (2015) caution against overgeneralized conclusions, as selection bias, inadequate consideration of

temporal sequencing, and inconsistent findings on the theoretical underpinnings challenge the robustness of the marriage-crime relationship.

Policy initiatives focused on enhancing family stability and addressing income inequality may serve as effective measures for crime reduction. Moreover, future research should investigate potential nonlinear dynamics, threshold effects, and cross-country variations to provide a more nuanced understanding of these interconnections.

The analysis presents significant insights into the socio-economic factors influencing crime in Azerbaijan. The findings indicate that both income inequality and divorce have a substantial impact on crime levels, with divorce exerting a stronger influence. These empirical results align with established theoretical perspectives on the relationship between social fragmentation, economic disparity, and crime (Krammer et al., 2022; Samat et al., 2024). The results of the Johansen cointegration test indicate the existence of a stable long-run equilibrium relationship between crime levels, divorce rates, and income inequality in Azerbaijan. This finding suggests that future increases in divorce rates and income inequality may lead to long-term shifts in crime dynamics. Furthermore, the Toda-Yamamoto causality test reinforces this conclusion. Notably, the stronger impact of divorce rates on crime aligns with sociological theories emphasizing the protective role of family stability in society (Gakuru & Yang, 2024; Mahadea & Kaseeram, 2018). Collectively, the findings highlight the importance of implementing comprehensive socio-economic policies that simultaneously target structural income disparities and strengthen family cohesion as a means to effectively reduce crime.

CONCLUSION

The primary objective of this study was to investigate the dynamic and long-term relationships between crime rates, income inequality, and divorce rates in Azerbaijan using advanced econometric techniques. The analysis revealed that both income inequality and divorce exert a statistically significant influence on crime levels, with evidence of a stable long-term equilibrium among the variables. These findings suggest that crime is not merely a result of individual behavior or law; it is also embedded in broader socio-economic structures. The implications of these results extend beyond academic inquiry, underscoring the need for integrated policy interventions that simultaneously address economic disparities and social fragmentation. Policies aimed at reducing inequality, promoting inclusive economic development, and strengthening familial and community support systems may prove effective in mitigating crime over the long term. Future research could build on these findings by incorporating additional explanatory variables such as education levels, urbanization, or employment trends, and by exploring potential regional disparities within the country. Comparative studies with other countries may also yield valuable insights into the generalizability of the observed relationships and inform more context-sensitive policy responses.

AUTHOR CONTRIBUTIONS

Conceptualization: Mayis Gulaliyev, Shahla Huseynova.

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Writing – original draft: Mayis Gulaliyev.

Writing – review & editing: Shahla Huseynova, Gunay Hasanova, Reyhan Azizova, Elmira Gojaeva.

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