



The Relationship between Violent Crime and Misery Index: A Specific Case in Iran

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Abstract

The economic status of society does affect both kinds and amounts of violent crimes. This paper is going to analyze the relationships between some economic variables in Iran, on one hand, and violent crimes on the other: Economic growth, misery index, and female employment rate are the main economic variables in this research. Proxies of violent crimes in this paper include the number of intentional murders, number of unintentional murders, number of maiming, number of beating documents, and poisoning documents. Some findings of this paper indicate a positive and significant relationship between economic variables and violent crimes in question in Iran in both the short run and long run. The periods of study are 1981-2016. One policy implication for this work is that increasing the cost of committing the crime, decreasing the misery index, and progress in economic growth, all can decrease violent crimes in Iran.

Keywords: Violent Crimes, Female Employment, Misery Index, Iranian Economy.

JEL Classification: D01, K13, K14.

Introduction

Crime is a multidimensional phenomenon and therefore is studied by several experts and different scientific disciplines. We can mention lawyers, biologists, sociologists, psychologists, historians, managers, philosophers, politicians, and economists typically (Hernandez, 2018; Beakers, 1968; Mehta and Preston, 2016). Not surprisingly, criminology which investigates crime, itself is an interdisciplinary field of study. Criminology is related to both behavioral and social sciences. The impact criminal behavior is imposing on the whole society: from individualistic through the societal level. Criminology studies the nature of crime management of crime, causes, and effects of crime, how to control crime so on and so forth. After the establishment of a new sub-discipline, so-called economic analysis of law (1960s) and especially following the publication of the seminal work of Gary Beaker "crime and punishment: an economic approach", we face with a considerable scientific product, analyzing the relationship of law and economics including crime and economic. Different economic schools each with a different approach are competing with each other in this regard. One can mention the Chicago approach, neo-institutionalist approach, and Austrian approach typically. Economics of crime deals with the application of economic models (and theories) and other economic methods to investigate and analyze the structure, (framework, performance of criminal justice on one hand) and their impact on the economic subsystem on

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the other. Economics of crime may answer some questions like this: Is the criminal law efficient, rational, sustainable, optimum, or not? In the economic analysis of criminal law, one can consider crimes as variables within the formwork of economic studies. Thus it is the domain of the interaction of crimes on one hand and economic variables on the other. Economic variables including unemployment, inflation rate, economic growth, and so on. This paper as a preliminary step is adapting the relationships between economic variables and violent crimes. Economic generally, and as a living condition is concerned, is intermingled with all aspects of good and bad dimensions of life. For instance, social well-being is a result of a good product of optimum management and economic performance. Poverty, unemployment, and high crimes are, however, the outcome of bad governance of the economic system. A sudden economic shock may change the circumstances of society crucially. Raising inflation, unemployment, inequality and other negative impacts of bad economic status may compel even ordinary and non-criminal Persons to commit different crimes including murder, theft, Robbery, etc. (Dadgar and Nazari, 2015).

Committing crimes imposes both direct and indirect impacts on society. For instance, rising in a society increases the health care costs resulting from nervous pressure and other types of stress. It also destroys the doing business environment, decreases productive activities and ultimately declines productivity. These outcomes lead to reduce economic investment and finally diminish economic growth (Demombynes and Özler, 2005; Cook et al., 2013). Considerable numbers of studies have indicated the economic impacts of financial crimes including theft, robbery, and so on, both in Iran and elsewhere.

Hence this research is concentrating on the relationship between violent crimes and economic variables in the Iranian economy. Violent crimes include international and non-international murder, beating and fighting, threatening to poise, and so on. One question of this research is that: whether committing violent crimes influences the economic variables in Iran?

To establish a sound and conclusive model, we added the misery index to our model as well. The misery index is the combination of inflation and unemployment rates. Not surprisingly, rising both inflation and unemployment rate in society do impose a disastrous status on any society including Iran. So it deserves to call the combination of inflation and unemployment rate, misery index. This article indicates the positive relationship between the misery index in Iran and the number of committed crimes in Iran.

Statistical Trend and Scientific Background

Unfortunately, the statistical data about the crime is not accurate in most countries generally and in Iran particularly. The official centers in Iran, which are responsible to report the number of crimes, murders, etc. underestimate the actual considerably the crimes in this country. One reason that proves the underestimation in question is that official and statistical centers report the number of court documentation for crimes as the amount of crime. But all of the crimes in Iran are not officially reported to be documented in court (Hoseinynejad, 2015). Hence relying on statistical data for crimes in Iran as a sole indicator for committing exact is deceptive. Committing the crime in Iran has had an increasing trend in recent years. Figure 1 indicates the trend in question.

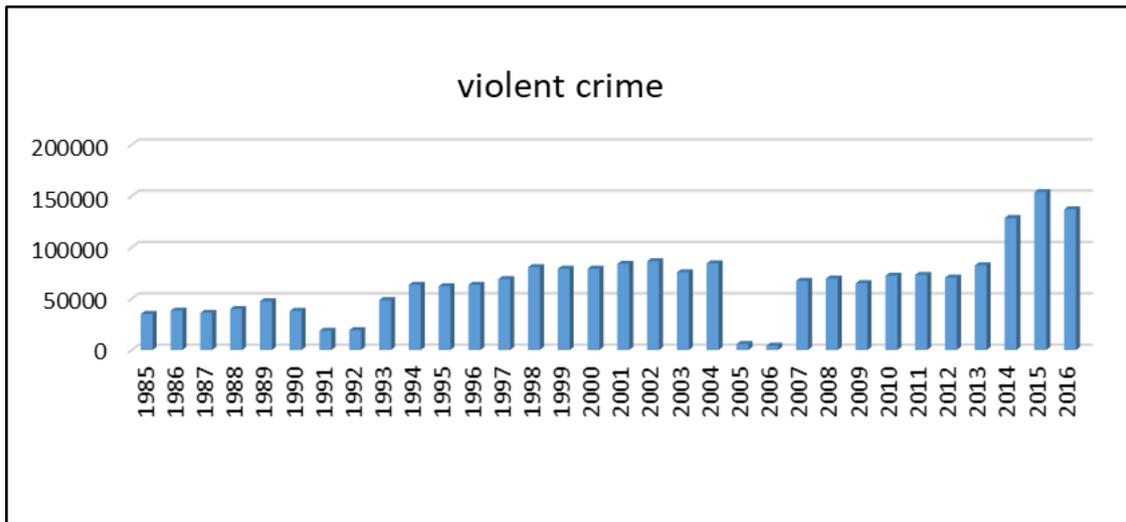
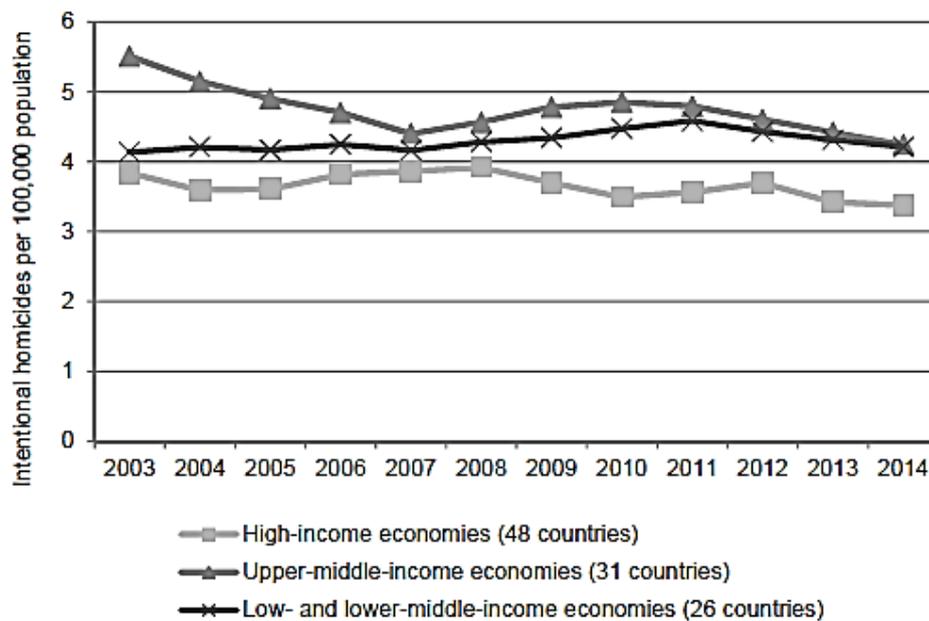


Figure 1. The trend of Amount of Violent Crimes in Iran
Source: Statistical Office of Police.

The world annual average of intention murder in 2014 is 5.3 person per 100,000 persons. Figure2 indicated the trend of intention murder per 100,000 persons for low and lower-middle countries, upper-middle-income countries, and high-income countries. As the figure shows the amount of crimes for low-income countries goes up increasingly, that of high-income countries, however go down slowly.

(a) *Intentional homicides per 100,000 population, by level of income, 2003-2014*



(b) *Intentional homicides per 100,000 population, by level of income inequality, 2003-2014*

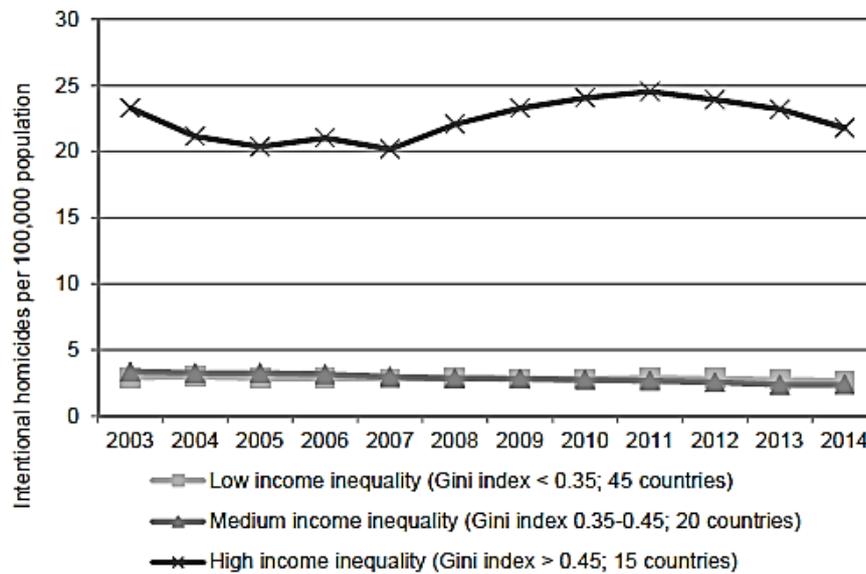


Figure 2. The Trend in Intentional Homicide, by Level of Income and Income Equality
Source: UNODC_Homicide Statistics (2016).

Mentioning some background for the relationship between crime and economic variables in Iran could be helpful and illustrate in turn the contribution of our research. By using econometric methods Dadgar and Nazari (2015) investigated the crime states in Iran. They used Kuznets curve and misery index for analyzing the case in question. The authors have used data for 30 years and tested the relationship between misery index and economic growth on one hand and amount of crime in Iran on the other. This research proved that there is a positive and significant relationship between misery index and amount of crime in Iran. Makipour and Rabani (2013) evaluated the relationship between crime and inflation great in Iran. The results indicated that inflation and unemployment rates do have positive impact on amount of crimes another research by Dadgar and Nazari (2013) indicated that misery index influences on robbery and murder in Iran significantly.

Mehrgan and Garshasby (2011) analyzed the relationship between robbery and income distribution in Iran. The result showed that there is a significant relationship between income distribution and Robbery in Iran. They also showed a significant and negative relationship between the monthly income of Iranian households and the amount of crime in Iranian. Asghar et al. (2016) investigated the impact of economic, social, and political factors on the crime rate in Pakistan. They indicated that there is a positive and significant relationship between poverty and inequality on one hand and the amount of crime in Pakistan on the other. Flallahi and Rodriguez (2014) studied the relationship between the unemployment rate and crime in the USA. The results showed that there is a positive relationship between the unemployment rate and amount of crimes in the USA. Chintarkarn and Herzer (2012) proved a sustainable relationship between income equality and crime. Also, Detotto and Manuelal (2010) indicated the positive and significant relationship between GDP inflation and import on one hand and crime in Italy on the other.

Theoretical Foundation and Introduction of the Model

Historically speaking, the first research on the economics of crime was launched by Beccaria

and Bentham in 1764 (Klevorik, 1985), although some classic criminologist believes in the helpfulness of crime studies, due to lack of empirical data, the majority of criminal studies are developed on theoretical analysis. Becker (1968) and (1973) developed the crime issue and completed the works of Beccaria in principle. Thus Becker entered the criminology and criminal studies subject into economics (Edmark, 2005). Becker defined the social loss function of crime as:

$$L = D(C) + TC(\pi, C) + bFC\pi \quad (1)$$

where D is the loss of crime, TC , cost of seeking arresting and detention, and $bFC\pi$, as social loss of punishment. F and π are policy-making variables. According to Becker these variables indicate the efficiency of the security system and the amount of punishment of society. By minimizing the social loss function concerning F and π , one can realize the propensity of people regarding committing a crime. If the benefit of committing a crime is declining as a result of rising arresting costs (empowering the police), the number of crimes will decline too. Becker also showed that the committing crime decline as the income of people increases. By adding income distribution variables, Ehrlich (1973) developed and augmented the work of Becker. One finding of Becker and Ehrlich is a negative relationship between income and committing a crime (Kelly, 2000; Hadad and Moghadam, 2011; UNODC, 2018).

Data and Model

In this article the data of the world bank (WB2018), the statistical center of Iran (SCI 2018) and the central bank of Iran, and (CBI 2018) for the 1981-2017 period. We estimated the behavior of economic variables and proxies for crime by econometric models (Pesaran 1997, Pesaran et al 2001). In addition and for deeper investigation the relevant articles if Iranian law of crime and punishment are too (IPL 2017). The general format of our mode is shown in equation 2:

$$\log(v\text{-crime}) = f \log(\text{wo-rate}), \log(\text{mis2}), \log(\text{GDP}) \quad (2)$$

where $\log(v\text{-crime})$ is the natural logarithm of crime based on police documents for crime in Iran. $\log(\text{wo-rate})$, natural logarithm for women employment rate above 10 years old. $\log(\text{mis2})$ as natural logarithm for misery index. $\log(\text{GDP})$ for the gross national product (according to 2011 base year). For confirming all econometric rules including stationary status and so, the one we used augmented dicky fuller test. Its result is shown in table (1):

Table 1. The Result of Stationary Status Test

Variables	ADF test statistic	Test critical values: 5% level	Probe	Result
Log(v_crime)	-3.722092	-3.568379	0.0362	stationary
Log(wo_rate)	-3.090481	-3.544284	0.1242	Non-stationary
Dlog(wo_rate)	-5.394840	-3.552973	0.0006	stationary
Log(mis2)	-4.208097	-3.548490	0.0111	stationary
Log(gdp)	0.071736	-3.548490	0.9956	Non-stationary
Dlog(gdp)	-3.708225	-3.574244	0.0378	stationary

Source: Research finding.

Model Estimation

We used the autoregression model with extended lags. The optimum model is related according to the Akaike info criterion (AIC) in Table 2.

Table 2. Akaike Info Criterion

Variables	Coefficient	Std.Error	t-statistics	probe
<i>Log(c_crime(-1))</i>	0.884711	0.149375	5.922766	0.0004
<i>LOG(WO_RATE(-1))</i>	2.814769	0.764546	3.681622	0.0062
<i>LOG(MIS2(-1))</i>	0.925666	0.304426	3.040694	0.0160
<i>LOG(GDP(-3))</i>	-2.919664	0.921166	-3.169530	0.0132
<i>C</i>	-2.348735	2.629323	-0.893285	0.3978
<i>@TREND</i>	0.323663	0.103793	3.118340	0.0143
<i>R2= 0.944309</i>				
<i>DW= 1.932432</i>				

Source: Research finding.

The output of the estimated model indicated that all coefficients are significant on a %5 level. This shows that all variables have been influencing crime in Iran in the short run. Women's employment rate and misery index do indicate a positive and significant relationship with the amount of crime in Iran. When misery index and women employment raise the amount of crimes rises too. Also, the relationship between GDP growth and the amount of crime is significantly negative: the higher the GDP growth is the lower the amount of crime would be. Before estimation the long-run coefficients and validating the model we applied diagnostic tests, the results of which are shown in Table 3.

Table 3. The Result of Diagnostic Test

TESTS	Statistical Quantity	probe
Normality Test	J-B= 0.087802	0.957049
Correlation LM Test	F= 2.97E-06	0.9987
Heteroskedasticity Test white	F= 0.501042	0.8967

Source: Research finding.

For confirming and determining existing long-run relations in the model we have applied Pesaran et al test (2001). The results of the question test are shown in Table 4.

Table 4. The Result of Growth Pesaran et al. (2001) Test

F-statistic	F-Bounds Test, K=3	
	5%	
	I(0)	I(1)
8.198018		
probe	3.38	4.23

Source: Research finding.

According to the result of Table4 equilibrium, a relationship is accepted at %5 levels. Table 5 indicated the long-run result.

Table 5. The Long-run Results

Variables	Coefficient	Std. Error	t-Statistic	Probe
LOG(WO_RATE)	7.991131	1.903440	4.198257	0.0030
LOG(MIS2)	2.331027	0.528571	4.410057	0.0023
LOG(GDP)	-1.573746	0.489584	-3.214458	0.0123
@TREND	0.311989	0.114031	2.735999	0.0256

Source: Research finding.

As Table 5 shows: firstly, there is a positive relationship between the amount of crime on

one hand and misery index and women employment rate on the other in Iran. Secondly, there is a negative and significant relationship between the amount of crime and gross national product in Iran for the period of 1981-2016. Thirdly the most influencing variables have been women's employment rate and misery index. One percent increase in women employment rate raises the number of crime increases by 3.4 percent. The result of the error estimation of the correlation model is shown in Table 6:

Table 6. The Result of Error Correction

Variables	Coefficient	Std. Error	t-Statistic	probe
C	-2.348735	2.629323	-0.893285	0.3978
@TREND	0.323663	0.103793	3.118340	0.0143
DLOG(V_CRIME(-1))	0.922126	0.186591	4.941954	0.0011
DLOG(WO_RATE)	1.391221	0.861120	1.615594	0.1448
DLOG(MIS2)	-0.177369	0.284428	-0.623599	0.5503
DLOG(GDP(-1))	2.369302	0.877532	2.699960	0.0271

$$EC = \text{LOG}(V_CRIME) - (7.9911 * \text{LOG}(WO_RATE) + 2.3310 * \text{LOG}(MIS2) - 1.5737 * \text{LOG}(GDP) + 0.3120 * @TREND)$$

Source: Research finding.

Estimation of coefficient of error correction model indicates that logarithm coefficient of all variables in the model including misery index, GDP, women employment, and crime are significant with one lag. Finley and due to investigating the structure stability of coefficients of the model we used the cumulative sum of recursive residual CUSUM and also sum squared of recursive residuals, CUSUMSQ. As figure 4 shows, the stability of coefficients is significant at a %5 level.

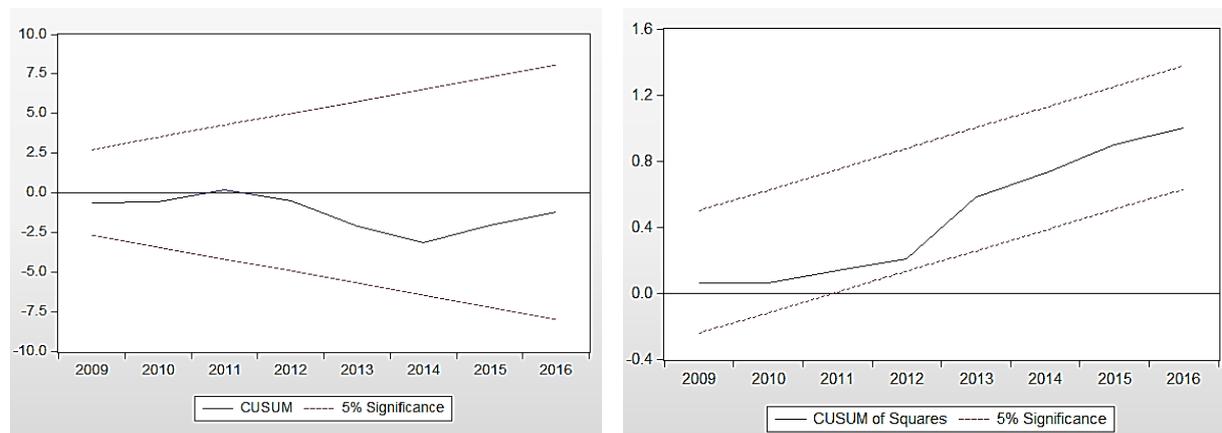


Figure 3. Stability of Coefficient

Source: Research finding.

Consequently, and as econometrical methodology is concerned, everything is in its standardized framework. Hence we can rely on the outcomes of the model regarding the behavior of main variables. These are the relationship between economic variables (including misery index and women employment rate) on one hand and the amount of crime in Iran. In the other case of the misery index, the result is straight. The positive relationship between misery index and crimes is expectable one. One case of violent crime is poverty and low welfare. The poorer people are, the more crime may they commit. In the case of women's employment, the result is complicated.

Conclusion

1. Increasing the amount of violent crime for any society is a problematic and warning element. This problem is much more crucial for less developed and developing countries including Iran. Deep investigating the real roots of violent crimes and combating with original sources of those crimes are paramount policies for all policymakers including Iranian ones.
2. Taking a scientific look into the process of committing violent crimes illustrates that there are some economic social, political, psychological, and legal factors behind committing crimes in question. The economic circumstance in any society including Iran is a brilliant factor influencing the amount of violent crime this article is investigating committing a violent crime in Iran and its relationship with some economic variables for 1981-2016 period.
3. The relationship between misery index and women employment rate on one hand and the amount of violent crime are analyzed in this research. The main index for analyzing this case is the number of documentation for violence in Iran. These include intentional and non-intentional murder, beating and fighting, threatening and poisoning.
4. Findings of the article indicate that: firstly, the amount of committing violent crime follows economic theories. Secondly, there are significant relationships between economic variables on one hand and the number of violent crimes on the other hand in both the short run and long run. For instance, there is a negative and significant relationship between the national income growth of Iran and the amount of violent crime. When GDP (as a proxy for national income) goes up the violent crimes go down.
5. There is a significant and positive relationship between the Misery Index in Iran, on one hand, the number of violent crimes on the other. Thus, a higher inflation rate and higher unemployment will indicate higher violent crime in Iran.
6. There is also a positive and significant relationship between women's employment rate and committing violent crimes too.
7. According to do results of this article one can maintain some policy implications: firstly, increasing the cost of committing a crime by officials and government could be an influencing factor in diminishing the violent crimes. Secondly, planning to simmer down the misery index (to have low inflation and low unemployment rate) could be a promising factor in the declining amount of violent crime in Iran.

References

- [1] Asghar, N., Qureshi, S., & Nadeem, M. (2016). Effects of Socioeconomic and Political Factors on the Crime Rate in Pakistan. *Journal of Political Studies*, 23(1), 183-206.
- [2] Becker, G. S. (1968). Crime and Punishment: An Economic Approach (13-68). In *The Economic Dimensions of Crime*. London: Palgrave Macmillan.
- [3] CBI. (2018). *Time Series Data*. Tehran: Central Bank of Iran Press.
- [4] Cook, P. J., Machin, S. J., Marie, O., & Mastrobuoni, G. (2013). Lessons from the Economics of Crime. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2119606
- [5] Chintrakarn, P., & Herzer, D. (2012). More Inequality, More Crime? A Panel Cointegration Analysis for the United States. *Economics Letters*, 116(3), 389-391.
- [6] Dadgar, Y., & Nazari, R. (2015). Analysis of Crime in Iran by Helping Economic Models. *Journal of Legal Studies*, 19(1), 63-86.
- [7] ----- (2013). Analysis of the Impact of Misery Index on Crime in Iran. *Journal of Economic Studies and Policies*, 9(2), 63-86.
- [8] Detotto, C., & Manuela, P. (2010). Testing the Effects of Crime on the Italian Economy. *Economics Bulletin*, 30(3), 2063-2074.
- [9] Demombynes, G., & Özler, B. (2005). Crime and Local Inequality in South Africa. *Journal of Development Economics*, 76(2), 265-292.

- [10] Edmark, K. (2005). Unemployment and Crime: Is There a Connection? *Scandinavian Journal of Economics*, 107(2), 353-373.
- [11] Ehrlich, I. (1973). Participation in Illegitimate Activities: A Theoretical and Empirical Investigation. *Journal of Political Economy*, 81(3), 521-565.
- [12] Fallahi, F., & Rodriguez, G. (2014). The link between Unemployment and Crime in the US. *Social Science Research*, 45, 33-45.
- [13] Haddad, G. K., & Moghadam, H. M. (2011). The Socioeconomic and Demographic Determinants of Crime in Iran (a Regional Panel Study). *European Journal of Law and Economics*, 32(1), 99-114.
- [14] Hernandez, J. (2018). *The Truth about Aaron*. New York: HarperCollins Publishers.
- [15] IPL. (2017). Law of Punishment in Iran, 2. Tehran: Iranian Judicial Center.
- [16] Kelly, M. (2000). Inequality and Crime. *Review of Economics and Statistics*, 82(4), 530-539.
- [17] Makipour, Z., & Rabani, A. (2013). Investigating Economic Causes of Social Trauma. *Strategic Research on Security and Social Order*, 6(2), 79-98 (In Persian).
- [18] Mehrgan, N., & Garshasby, S. (2011). Income Equality and Crime in Iran. *Journal of Economic Research*, 11(4), 109-125.
- [19] OECD. (2018). Annual Reports in under Economy Activities. Retrieved from https://issuu.com/oecd.publishing/docs/eo_and_ps_part
- [20] Mehta, N., & Preston, S. (2018). Are Major Behavioral and Sociodemographic Risk Factors for Mortality Additive or Multiplicative in their Effects? *Social Science & Medicine*, 154, 93-99.
- [21] Pesaran, M. H. (1997). The Role of Economic Theory in Modelling the Long-run. *The Economic Journal*, 107(440), 178-191.
- [22] Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- [23] UNODC. (2018). *Homicide Statistics*. Vienna: UNIDC Publishers.
- [24] WB. (2018). Reports in Crimes and Criminal Activities. Retrieved from <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/630671538158537244/the-world-bank-annual-report-2018>
- [25] SCI. (2018). *Economic Indexes*. Tehran: Statistical Center Publisher.

