

The Relationship between Drug Smuggling and Unemployment (Case Study: Iran)

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Abstract

Crime economy is one of the interdisciplinary subjects which intend to analyze crime economically. With regard to increasing trend of crime in our country, it is important to study different aspects especially economic aspect for some crimes such as drug smuggling which has direct relationship with economic affairs and accurate and scientific understanding of cause and effect relationships will give suitable method for better management of society to the policymakers. In the present article, analytic –descriptive method has been used and relationship between unemployment rate and drug smuggling is explained by reliance on statistics and information and on the basis of regression models in OLS method.

Research finding shows that positive relationship between unemployment rate and drug smuggling as well as positive relationship between monthly cost of families and ratio of city dwelling to drug smuggling offence and negative relationship between monthly income of the families and drug smuggling. The obtained results show that unemployment causes another cost i.e. some crimes such as drug smuggling which will have harmful effects for society in addition to some charges such as unemployment insurance cost and costs of reduction of skill and specialty of labor force and other direct and indirect charges which are imposed on economy of a society.

Keywords: Drug Smuggling, Unemployment, Divorce, Income

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Introduction

Iran has experienced very high unemployment rates after Islamic Revolution (diagram 2, table 1) so that unemployment rate reached its highest point i.e. 14.44% in 1989 and faced many fluctuations in years before and after that.

Unemployment means some of the active population of the country which seeks to find job but they don't find suitable job. Unemployment increases public expenses on unemployment insurance. High unemployment will cause to decrease skills and knowledge of

labor force if it is continual while it costs a lot for production labor force. With regard to economic theory of crime which has been used in the previous decades, unemployment causes another cost which is increase of crimes such as drug smuggling.

Different studies discussed effects of unemployment increase in three decades after Islamic Revolution but none of them have studied its effect on crime. An important question which has occupied mind of many policymakers of a country is that what factors can be effective on drug smuggling? Whether increase of disciplinary activities and struggling with traffickers can cause to decrease crime and especially drug smuggling? In fact, the most important question which should be answered in this research is that whether there is significant relationship between unemployment and drug smuggling? If yes, whether this relationship is negative or positive?

Different studies have been done on socioeconomic, cultural and disciplinary factors effective on crime. Major studies have been written with emphasis on sociocultural analyses and some of them have been done on job condition of the criminals as a secondary subject. For example, Poor Ahmad et al (2002-2003) in study on employment condition of the unemployed concluded that 83% of the criminals were employed before they were arrested and jailed and about 17% of the studied population was unemployed. In this research, jobs of the criminals have been classified. These results show that only about one fifth of the criminals were unemployed. On the other hand, unemployment has no direct relationship with crime but since statistical population of this research is only Tehran city some crimes have been compared in this research. Therefore, one can not obtain result about relationship between unemployment and drug smuggling.

In another research which has been done by Poor Ahmad and Kalantari in Tehran city, about 13% of the criminals earned living only through illegal and criminal acts. On the other hand, these persons were unemployed and about 87% of the criminals were employed. As observed, results of this research are contrary to the previous research results which were mentioned above. Since statistical population mentioned in both researches was a limited population and statistical information of this research was based on questionnaires which have been completed by the criminals and may be incorrect with regard to position of the criminals, therefore, results of this research don't have high reliability and can not be generalized to the entire country.

In a study which was done by Sadeghi et al, it was concluded with use of panel data relating to 26 provinces during 1997-2001 that 10% increase of unemployment rate increases crime rate including robbery by 1.8%. This study shows that there is direct relationship between unemployment and crime.

Which one of these results can be correct? It seems that because drug smuggling is one of the crimes which have high income, it is expected that probability of committing such crime be increased when a person is unemployed and as a result of low income level. On the other hand, the most important hypothesis of this research is significant positive relationship between unemployment rate and drug smuggling.

On this basis, relationship between unemployment and drug smuggling is studied with use of data of time series 1981-2006. Since economic theory of crime is the first and best economic theory which can be implemented on the crimes, this study emphasizes on such theory. Unemployment fluctuations during this period facilitate identification of assumed effects of unemployment on drug smuggling. Relationship between city dwelling, divorce, income and expenses of Iranian families and drug smuggling has been studied. City dwelling means total population of families residing in cities. Divorce is one of the factors of breaking

marriage. Divorce is an arbitrary mechanism which has been accepted in all societies and man and woman and both of them are allowed to separate from each other under some conditions and during stages of marital bonds and go on their own way. On the other hand, divorce means breaking marital relation. In this research, family income means all income which a family earns legally and family expenses means monetary value of the goods or services supplied by the family for consumption or granting reward to others in a month.

Theoretical framework:

Economic theory of crime studies crime as an activity which takes time and accompanies economic benefits on the basis of model presented by Garry Becker. On the basis of this theory, a person selects among legal and illegal activities by comparing benefits of these activities and on the basis of economic theory under uncertainty conditions. This theoretical model can be implemented on crimes and hereinafter, crime means drug smuggling. \

This model explains a personal selection between legal and illegal act as income during a defined period. Work and crime have been considered as two substitute activities which can not be combined with each other. In this model, W specifies personal wage resulting from legal work and W_b is benefits resulting from crime. A is unemployment insurance and u is unemployment rate. U should be interpreted as probability of unemployment during a specified period. If a person selects crime, p and S show probability of arrest and penalty. It has been assumed that all persons are neutral risk and are equal in ethical considerations which may have effect on tendency to committing crime. The person selects committing crime when expected benefits of that crime are higher than those of legal work. It means that if relation 1 is realized:

$$E(W_b) > E(W) \quad (1)$$

Relation 1 indicates that if expected benefits of crime are higher than those of legal work and person chooses to commit crime, it means that committing crime compensates failure to do legal work. An increase in the left side of this relation increases probability of committing crime. While an increase in the right side of this relation increases probability of doing legal work. In this article, we assume that the sample person prefers legality, honesty and honorable life given that other conditions are fixed and he selects legal work in case that equation $E(W_b) = E(W)$.

Left side of the equation i.e. expected benefits of crime which is expectation of benefits resulting from committing crime is obtained from weighted mean of benefits in two assumed cases that a person is arrested or not for committing crime, P is probability of arrest, and $1-P$ is probability of non arrest. If the person chooses to commit crime, benefits resulting from W_b is modified with penalty S . expected benefits of crime can be written as follows:

$$E(W_b) = (1-p)W_b + p(W_b - S) \quad (2)$$

Expected benefits of legal work are affected by unemployment rate and unemployment insurance. Expected benefits of legal activities are obtained with the same expectation of benefits resulting from honorable life, weighted mean of wage and unemployment insurance. On this basis, unemployment rate u indicates probability of receiving unemployment insurance by the person and employment rate, $1-u$ indicates probability of employing person and receiving legal wage. Expected benefits resulting from legal work are obtained as follows:

$$(3) \quad E(W) = (1-u)W + uA$$

Now, one can write the first relation for the person who chooses to commit crime:

$$(1-p)W_b + p(W_b - S) > (1-u)W + uA \quad (4)$$

Relation (4) shows that how different variables have effect on relationship between expected benefits and choosing legal work. It has been assumed that risk of not being employed during the period is less than risk of being arrested due to committing crime i.e. $u < p$. In addition, it has been assumed that average penalty S is higher than cost of unemployment i.e. $W > A$. In spite of these hypotheses, committing crime is more dangerous than choosing a legal work and honorable life. For compensating higher risk relating to criminal acts, expected benefits of crime W_b should be higher than expected benefits of legal work W . A person who chooses to commit crime, relation 4 conditions that if risk of being arrested or penalty increases, the expected benefits of crime will increase as well. In contrary, difference in benefits which causes the persons is willing to commit crime instead of work i.e. $W_b - W$, $W - A$ decreases with increase in unemployment rate and cost of unemployment. Higher levels of W_b and u allow the person to commit crime while higher levels of p , A and W increases probability of choosing legal work.

Review of literature

In each country, few studies have been done on effects of economic factors on crime. In this field, one can name a research which has been done by Sadeghi et al. In this research, Sadeghi studies economic reasons and committing murder and robbery with use of panel data relating to 26 provinces during years 1997-2001. Results of this research are direct relationship between income inequality and unemployment rate and murder and robbery rate. On the basis of this research, robbery rate is inversely related with industrialization rate. In another research which was done by Hosseini Nejad, Hosseini Nejad studied economic reasons for all types of robbery in Iran with use of combined data model. Its results show positive relationship between income inequality and disciplinary costs and robbery.

On the other hand, one can refer to the articles which they studied in economic view of drug smuggling. Fariborz Raees Dana in an article called drugs market in Iran studied structures of political economy and social economy relating to smuggling and drugs. Of results of this research, one can refer to positive relationship between increase of poverty and traffickers especially in eastern borders.

In another research, Sharzad Broomand studied retailing and wholesale price of drugs, export and income obtained from it. This article is only a statistical analysis of all economic statistics relating to drug smuggling and no conclusion has been made at the end of the article.

Akbar Aliverdi Nia in another article explained social factors effective on crimes of drug in the country. On the basis of results of this research, industrialization, unemployment, individualism, social disorganization and anomic status have direct and indirect effect on drugs crimes.

None of these articles have emphasis on effects of unemployment rate on drug smuggling. Many articles which have been written on crime economics have paid attention to relationship between unemployment and crime. Many articles used combined data. For example, one can refer to Raphael et al, Doyle et al, Levitt & Steven and Gould, E.D et al who studied the combined data for different years and in different states of America and all of these four American studies confirmed this theory that worse conditions in labor market accompany higher rates of crime against property and ownership.

Entorf, H. & Spengler, H, 2000 performed the same work for states of Germany and Papps and Winkelmann performed study with use of data obtained districts of New Zealand. The results presented by these studies have significantly weak significance and imply that

unemployment rates have effect on some kinds of damage crime and the results presented by Entorf & Spengler regarding Bundeslander state of former West Germany are weak and ambiguous (even negative estimates have been presented for some types of drug smuggling) but when they studied allied Germany, they obtained stronger and positive results for all of the crimes. Scorcu A.E.&Cellini, R,1998 studied time series data of Italy and found that unemployment was a significant descriptive variable for robbery. Schuller, B-J confirmed positive relationship between unemployment and crime with use of time series data of Switzerland. On the other hand, studies on persons emphasize mostly on the young because younger persons especially young men had more tendency to crime on the basis of different reports. For example, Witte, A.D.&Tauchen, H., used sectional data relating to American young men and found that the employed persons have lower tendency to crime than those who are unemployed. Besides these studies, one can refer to other researches which have studied relationship between crimes against property and ownership and other economic variables other than unemployment. For example, Machin, S and C Meghir, 2000 obtained effect of semiskilled workers' wages in England on crimes against property and ownership with use of police force in different districts for period 1975-1996. Bourguignon 2002 showed that the criminals in Colombia are found among the people who live in family with income below 80% of average income of society.

In another article, Macdonald and Pudney, 2000 study effects of use of illegal drugs on labor market with use of data of British Crime Organization. In this research, there are weak evidences confirming relationship between use of drugs and job acquisitions. In this research, there are persuading evidences that use of drugs increases risk of losing job or not finding job irrespective of age and gender.

Review of literature shows relationship between crime and unemployment in most cases such as studies performed in America and in some cases; the obtained results are weak and ambiguous.

Research Methodology

Type of research

This study is of analytic –descriptive type. In order to adjust economic theories with facts of society, causal relationships between variables are studied with use of statistics and figures and after adjustment to theories, the related hypotheses are tested with use of inferential statistics and econometric methods in order to judge about rejection and proof of the presented hypotheses.

Statistical population and sampling method

In the present research, library method has been used for gathering statistics and figures and historical documents and the used statistics includes set of time series data from 1980 to 2008 which has been taken from statistical calendars of Statistics Center of Iran. In addition to statistical calendars of different years, time series information bank located in Central Bank of Iran web site (Cbi.ir), Statistics Center of Iran (Sci.org.ir) and statistics inserted in website of State Organization for Registration of Civil Status (Sabteahval.ir) have been used.

Data analysis method

Starting point of our econometric model which was formed on the theoretical and experimental fundamentals is the following model:

$$Drug_t = c_t + \theta U_t + \beta X_t \quad (6)$$

Where the variables used include:

Drug_t, quantity of the detected drug for each 100000 citizens

C_t is perturbation sentence

U_t unemployment rate

X_t is vector of other control variables

Estimated coefficients can be interpreted as elasticity that is these coefficients can show change coefficients of drug smuggling crime rate due to unity of change in each one of the explained variables.

Diagram 1. Drug smuggling crime

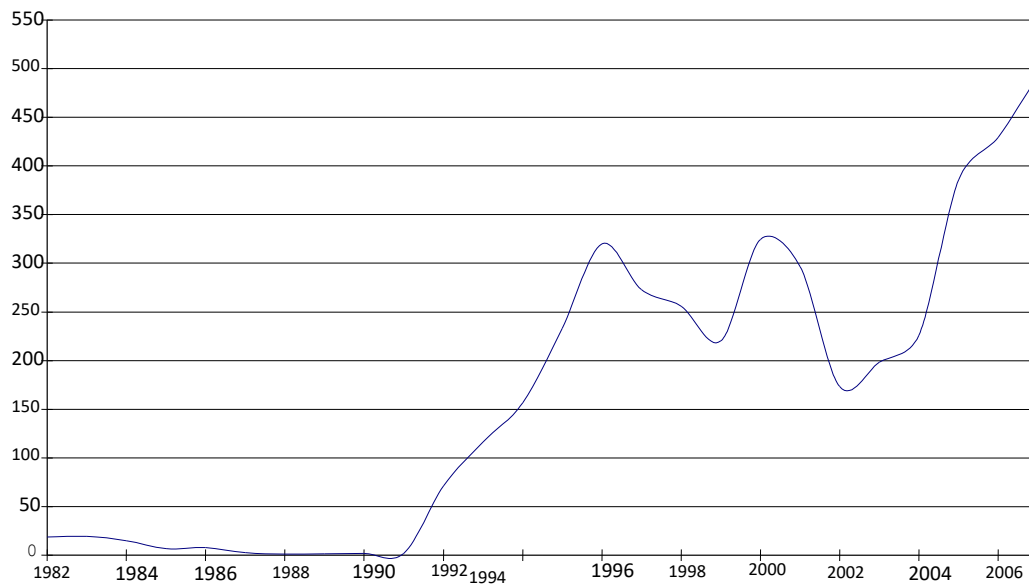


Diagram 2: Unemployment rate in Iran(%)

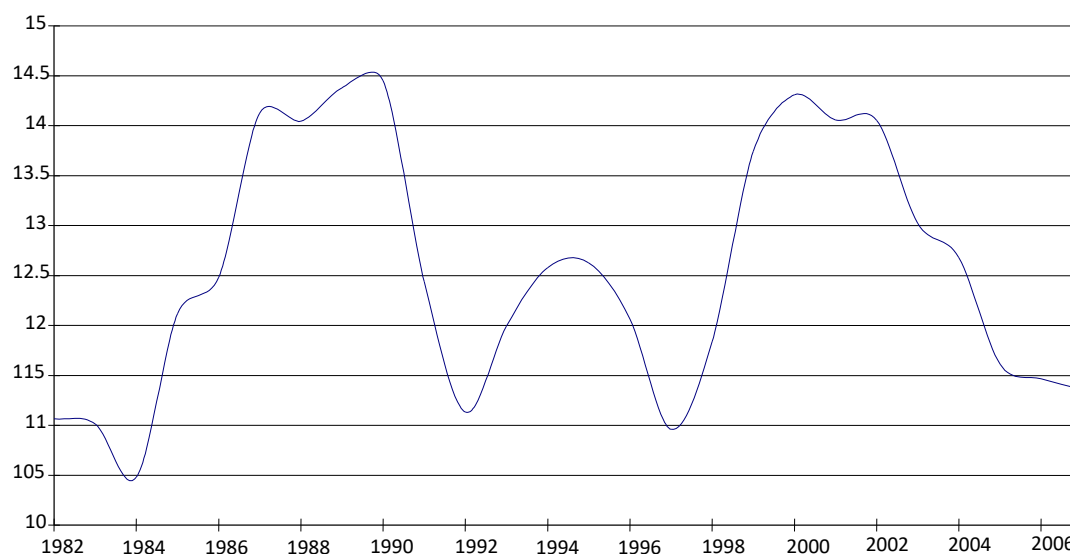


Diagram 1 of Dr indicates quantity of the detected drug in each 100000 persons for the related years. As this diagram shows and table 1 shows, quantity of drug detected during years 1982-1991 i.e. the first decade of victory of Islamic Revolution and holy defense years has been decreasing which is indicative of spiritual conditions and stronger beliefs in society. But from 1991, it was increasing trend in spite of fluctuations.

Diagram 2 shows unemployment changes trend in period 1982-2006. As table 2 shows, the minimum level of unemployment during this period relates to 1983 with 10.42 % and the maximum level relates to 1989 with 14.44%. in other years , these two numbers were fluctuating . Fluctuation in unemployment rate causes their effect on drug smuggling rate.

On the basis of definition of unemployed person and unemployment rate by International Labor Organization, ILO, criterion for unemployment or employment has changed since early 2005 in our country. On the basis of the previous definition, unemployed person means some active population which is not regarded employed and has three characteristics of lacking job, being ready for work and seeking for job within 7 days before statistics official refers to him.

Those who have been unemployed due to season and they seek for jobs are regarded as unemployed. On the basis of this definition, if a person has no continual job but has worked at least for two days in a week, he will be regarded as the employed. But in the new definition which has been applied on the basis of standard of International Labor Organization and since early 2005, an employed person means some part of the active population who has worked at least for one hour in a week. As specified, new definition has effect on decrease of unemployment rate but to what extent this decrease is requires a separate research but with regard to the fact that there is decreasing trend of unemployment rate (diagram 2) before 2005 and this trend has continued in 2006 and with new definition, one can ensure that new definition of unemployment has no considerable effect on decrease of this rate in 2005 in comparison to the previous year and general trend of unemployment rate decrease is correct.

Other control variables which have been used include city dwelling rate T , divorce rate V , average monthly income of Iranian families I and monthly expenses of Iranian families E . In variable I , family income means funds and monetary value of goods and services which have been provided in return for work or the applied capital or other sources (pension, asset income, transferred receivables and the like) to each member of family and average monthly expenses of Iranian families E means monetary value of goods and services which have been provided by the family for consumption or grant to other in a month and the information relating to these two variables has been obtained from statistics plan of Statistics Center of Iran and expense and income of the family.

As specified in table 1, average monthly income of Iranian families as well as average expense of Iranian families during the related period have had uniformly increasing trend. This table shows city dwelling rate. City dwelling ratio in this article means ratio of total population of urban families to total population in the country. Due to immigration of the villagers to cities, city dwelling ratio has been increasing during these years that is ratio of urban population to total population has increased for different reasons such as immigration of the villagers to cities and divorce rate which is defined as number of divorce registered in Divorce Registry for each 1000 persons has been decreasing till 1993 and increasing since 1993 later on.

Table 1

Statistics of Independent and Dependent Variables

V	I	T	E	U	Dr	YEAR
59.822	8.1667	50.532	9.6295	11.064	18.4914	1981
73.6	9.1786	51.264	11.574	11.013	19.2742	1982
81.374	11.586	52.004	14.373	10.476	14.7669	1983
76.81	12.99	52.76	15.927	12.116	6.71143	1984
81.9	13.068	53.52	16.313	12.482	7.78028	1985
71.21	14.127	54.29	17.301	14.126	2.69127	1986
65.99	15.604	54.83	19.977	14.044	1.30098	1987
63.77	18.738	55.37	23.823	14.379	1.5583	1988
63.82	20.664	55.91	28.278	14.448	1.80194	1989
69.41	27.18	55.46	32.675	12.437	1.73407	1990
71.46	36.7	57.02	41.583	11.131	71.2108	1991
59.98	45.959	57.85	50.88	11.993	116.392	1992
50.99	55.878	58.7	61.202	12.577	156.782	1993
56.07	75.194	59.55	84.438	12.628	232.991	1994
58.69	99.413	60.42	123.62	12.065	319.778	1995
62.97	131.2	61.31	150.4	10.959	272.842	1996
68.56	163	61.8	182.09	11.837	255.897	1997
68.55	204.33	62.43	228.95	13.741	220.316	1998
80.27	251.05	63.32	286.17	14.311	324.334	1999
84.7	295.29	63.96	332.07	14.057	296.582	2000
93.68	341.93	64.6	377.11	14.054	173.321	2001
102.44	434.23	65.24	469.71	13.023	198.203	2002
108.52	527.02	65.84	555.54	12.677	225.796	2003
109.2	626.26	66.41	708.52	11.61	385.497	2004
123.04	734.61	66.68	806.21	11.466	429.233	2005
133.44	871.98	68.46	907.13	11.358	492.407	2006

Finding

The used model for study on effect of unemployment rate and other economic and demographic variables on drug smuggling was expressed and estimated as follows:

$$(7) Dr_t = C + \beta_1 U + \beta_2 E + \beta_3 T + \beta_4 I + \beta_5 V$$

Dr is drug smuggling rate and indicates quantity of the detected drug in each 100000 persons which has been considered as index for drug smuggling.

U is unemployment rate.

E indicates average monthly expense of Iranian families in Tomans 1000.

T is city dwelling ratio and equals to ratio of urban population to total population.

I is average monthly income of Iranian families in Tomans 1000.

V is divorce rate and indicates the number of divorces in each 100000 persons.

The results obtained from estimation of the model are as follows:

$$Dr_t = 15/96 + 0/44U + 1/12E + 5/30T - 0/64I - 3/23V \quad (8)$$

Interpretation of estimated coefficients which are shown in equation 8 is as follows:

There is direct relationship between unemployment rate and drug smuggling that is increase of unemployment rate increases the quantity of drug detected in each 100000 persons. The

estimated coefficient I is a negative number which indicates negative relationship between average monthly income of Iranian families and drug smuggling rate. It means that with increase in average monthly income, quantity of the drug detected decreases. The estimated coefficient T indicates direct relationship between city dwelling and drug smuggling rate. It means that increase in immigration of villagers to the cities and other reasons which increase urban population relative to total population increases quantity of the detected drug. This result is logical with regard to the fact that it is difficult to control mass and centralized population. Estimated coefficient of average monthly expense of Iranian families is positive that is increase in monthly expense of families increases quantity of the detected drugs and finally, there is negative relationship between divorce rate and smuggling rate. It means that with increase in number of the registered divorces in each 100000 persons, quantity of the detected drug decreases.

F test (general regression significance test) indicates general significance of the model in 95% level. R^2 coefficient level equals to 80%. This coefficients level indicates that about 80% of drug smuggling changes can be explained with the variables introduced in the model.

Table 2

Estimated coefficients

Estimated coefficients	Independent variables
15.966	C
0.441	U
1.120	E
5.301	T
-0.644	I
-3.230	V
0.801	R^2
16.16	F

Discussion and Conclusion

In this article, we seek to find relationship between unemployment and rate of drug smuggling in Iran. Other control variables were studied in this research including monthly expense of families, divorce rate, ratio of city dwelling and monthly income of Iranian families. The obtained results show that there is significant relationship between unemployment rate and drug smuggling and with increase in unemployment rate, drug smuggling which has been shown on the basis of drug quantity detected in each 100000 persons. For each 1% increase in unemployment rate, the detected drug in each 100000 persons increases by 0.44 kg. On the other hand, given 70 million population, one can say that 1% increase in unemployment rate increases about 308 kg of drug in the country. The obtained results show that increase in city dwelling rate and increase in monthly expense of Iranian families will increase quantity of the detected drug. For 1% increase in city dwelling ratio, the detected drug in each 100000 persons increases by 5.30 kg. Each 1000 Toman increase in monthly expenses of the families causes to increase the drug detected by 1.2 kg in each 100000 persons. On the other hand, increase in monthly income of the Iranian families and increase in number of the registered divorces will decrease the quantity of detected drug. Each 1000 Toman increase in monthly income of the families causes to decrease the drug detected by 0.64 kg in each 100000 persons. Increase in the registered divorces in each 1000 persons will decrease the quantity of detected drug by 3.2 kg in each 100000 persons. Coefficient level R^2 equals to 80%. This

coefficient level indicates that about 80% of changes in drug smuggling can be explained with the model introduced variables.

Results of this research are similar to those of most studies which have been done abroad and mentioned in literature in terms of positive significant relationship between unemployment rate and crime rate i.e. drug smuggling and confirm the theoretical fundamentals which have been used in this research. In comparison to the local studies, one can say that results of this study are similar to results of the research which has been done by Sadeghi et al but this research uses stronger theoretical model which studies relationship between unemployment and drug smuggling and emphasizes on drug smuggling and studies 23-year statistics of the country. On the other hand, results of this study are different from those of Pour Ahmad et al because in their study, 83% of the criminals were employed before they were arrested and jailed and about 17% of the studied population was unemployed. On the other hand, unemployment has no direct relationship with crime but since statistical population of this research is only Tehran city, some crimes have been compared in this research. More importantly, statistical information of this research was based on questionnaires which have been completed by the criminals and may be incorrect with regard to position of the criminals; therefore, results of this research don't have high reliability.

On the other hand, this research faces some limitations and one of the internal validity limitations is change in religious attitude of the people during the studied period. Since early years which are studied in this research relate to the first decade of Islamic Revolution, the people had strong religious morale with regard to war conditions and revolution governing society and this factor can be effective on committing crime, religious and cultural beliefs. But because there was no specified criterion and variable for measuring such morale, it was not possible to study this variable in this research. In the next researches, one can use sectional data such as province statistics for a given year and include effect of religious and cultural beliefs with use of indices such as social capital which is estimated in all provinces. One of other validity limitations of this research is not considering intensity and weakness of disciplinary and judicial conduct toward the criminals and their arrest which can be effective in statistics relating to drug traffickers. Statistics of the drug smuggling recorded by the judicial authorities increases, otherwise, statistics of drug smuggling decreases. Due to lack of suitable criterion which can show judicial and police conduct during these years, it is not possible to enter the variable which represents this subject in the model but if data used in the next researches is sectional, one can show effect of this variable on drug smuggling with use of some indices such as budgets allocated to Disciplinary forces of each province which is not easily accessible. In any way, it is assumed in this research that religious and cultural beliefs and performance of Disciplinary and Judicial forces have been fixed during the studied years.

One of the validity limitations of this research is change of unemployment definition which has been imposed by Statistics Center of Iran since early 2005 and the number of the unemployed has decreased to some extent in accordance with the new definition. However, because unemployment rate has not decreased considerably in 2005 compared to the previous year and there was decreasing trend of unemployment rate in 2006 and on the basis of new definition compared to 2005, change of unemployment definition is not considerable limitation for this research in addition that new definition includes only the last two years. In any case, use of sectional data can remove this limitation and it is suggested to compare between provinces of the country in one year in the next researches.

Research results show that policymakers of the country should pay more attention to factors of crime increase in order to decrease crimes of drug smuggling than disciplinary and

judicial issues. Economic promotion and development for decreasing unemployment rate and increase of income can be one of the solutions.

More attention to villagers and increase of equipment's and job opportunities for them can decrease their tendency to immigration to the cities and decreases city dwelling ratio and it is necessary to increase necessary cultural and religious educations. By promoting religious issues, one can clarify drug smuggling for the public as bad deed so that a person can not commit drug smuggling due to high income of drug smuggling and low income of legal activities.

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