

AN EMPIRICAL STUDY OF SOCIO-ECONOMIC DETERMINANTS OF
CRIME

744748

The Institute of Economics and Social Sciences
of
Bilkent University

by

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In Partial Fulfillment of the Requirements for the Degree
of
MASTER OF ARTS

In

144748

THE DEPARTMENT OF MANAGEMENT
BILKENT UNIVERSITY
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August 2004

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ABSTRACT

AN EMPIRICAL STUDY OF SOCIO-ECONOMIC DETERMINANTS OF CRIME

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Crimes lower the quality of life for many people in all societies. The concept of crime prevention is directly related to the studies about causation and prevention methods. State statistics institutes and law enforcement agencies store various kinds and quantities of data. Law enforcement agencies can use these data to take some measures to eliminate and minimize the crime rates. Temporal and spatial variations in crime rates have been studied extensively in the literature. A variety of demographic factors including unemployment rate, education level, age composition of the population, and average income level have been suggested by different researchers as explanatory variables for observed variations in crime rates. Variables such as number of police per capita, crime clear-up rates, and incarceration population have been considered as deterrents of crime. In this thesis, using cross-sectional data associated with 81 cities in Turkey, selected types of crime (murder, theft, crimes against persons and property) are empirically analyzed. The multiple regression results indicate that crime rates in general are negatively related to clear up rates and average income level in a region seems to be positively related to crimes against property. For short term forecasting of crime rates, a trend and seasonality adjusted exponential smoothing scheme is applied to the time series data for theft rates in three major cities. The highest mean absolute percentage error computed based on one-period-ahead forecast errors is less than 15 % in all cases.

Keywords: Crime analysis, law enforcement, criminality in Turkey, short-term forecasts of crime.

ÖZET

SUÇA ETKİYEN SOSYO-EKONOMİK FAKTÖRLER ÜZERİNE AMPİRİK ÇALIŞMA

Dursun ARSLAN
YÜKSEK LİSANS TEZİ, İŞLETME FAKÜLTESİ
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Ağustos 2004

Her toplumda suçlar bireylerin yaşam kalitesini azaltmaktadır. Suç önleme kavramı, suçların nedenlerinin ve önleme yöntemlerinin incelenmesi ile yakından ilişkilidir. Devlet istatistik kurumları ve kolluk kuvvetleri çok çeşitli ve nicelikte suç verileri depolar. Güvenlik ile ilgili kurumlar, bu verileri suç oranlarını en alt seviyelere indirmek amacıyla kullanabilirler. Suç oranlarındaki zamansal ve mekansal değişimler üzerine literatürde bir çok çalışma mevcuttur. İşsizlik, eğitim seviyesi, nüfusun yaş dağılımı ve kişi başı gelir bir çok araştırmacı tarafından suç oranlarındaki farklılaşmaları açıklayan sosyo-ekonomik ve demografik faktörler olarak önerilmiştir. Kişi başına polis oranı, suçların aydınlatılma oranları ve hapisanedeki tutuklu sayıları ise caydırıcı faktörler olarak incelenmiştir. Tezde Türkiye'nin 81 ilinde işlenen hırsızlık, cinayet, şahsa ve mala karşı suçlar ampirik olarak analiz edilmiştir. Çoklu regresyon sonuçları, gözlemlenen suçların aydınlatılma oranları ile ters, kişi başına düşen gelir ile doğru orantılı olarak değiştiğini göstermektedir. Üç büyük ildeki hırsızlık oranlarının kısa dönemli tahmini için, 53 aylık zaman serisi verilerine, eğitim ve mevsimsellikte ayarlanmış üssel düzeltme tekniği uygulanmıştır. Bütün uygulamalarda en yüksek ortalama mutlak hata oranı 15 % olarak gözlemlenmiştir.

Anahtar Kelimeler: Suç analizi, kolluk kuvveti, Türkiye'de suçluluk, kısa-dönemli suç tahmini.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to Assistant Professor Doğan SEREL for his continuous support, guidance, patience throughout this study, and supervision he provided during the entire course of this study. I wish to thank Assistant Professor Yavuz Günalay and Associate Professor Faruk Selçuk for their helpful comments.

I would also thank my beloved wife, Berrin Gölcük Arslan.

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CHAPTER I

INTRODUCTION

1.1 Why Crime?

Crime is as old as human being. Communities suffer from the negative effects of crime and disorder. The illegal activities threaten lives and properties. Crime has social and economic costs. It costs very huge amount of money to the taxpayers and even greater loss to the quality of their lives. Turkey spent a considerable amount of its total GDP (1.634.793 million TL and 2.051.782 million TL) as direct expenditures of law enforcement agencies in 2000 and 2001 respectively (EGM, 2000:101 and 2001:116) (See Appendix A). Indirect costs include medical, insurance and criminal justice system costs. Cost studies indicated that a homicide (including prosecution, surveillance, and execution) costs to the state and society up to 1 million dollars in U.S. (Bran and Price, 1999) and 1.1 million pounds in England (Demirtaş, 2001:84). States aim at the peace of mind and security of the citizens. In democratic societies, constant attention is paid to the effective prevention, control of crime and the safeguarding of individual and public security (Sakalauskas, 1999).

The incidence of crime is very important for all societies. Public concern in all countries is rising about the security issues day by day. Society's most serious problem is high crime rates in most western countries. In Buenos Aires, the capital of Argentina, thousands of people walked to demonstrate their discomfort from the insecure environment in the country.¹

Crime prevention and crime control matters, which are directly related to personal and property security, will never lose its importance according to the theory of Abraham Maslow's Needs Hierarchy as far as human beings exist. The Caracas Declaration, approved by United Nations General Assembly Resolution 35/171 of 15 December 1980, pointed out the sharp increase of crime in various parts of the world and called attention to the negative impact of such trend on "the global development of nations on human dignity, on the property and spiritual quality of life." The declaration concluded that it is urgent to unite efforts to "intensify technical and scientific co-operation directed towards crime prevention and criminal justice in the political, economic, social and cultural aspects" (Buendia, 1989:10).

The number of crimes in Turkey has a rising trend as in other countries. The number of recorded crimes doubled in four-year period between 1999 and 2002. Table 1 displays public order crimes (crimes except traffic, terror, crimes against society and organized crimes) in police and gendarmerie area in Turkey.

¹ www.ntvmsnbc.com/news/264154.asp and Turkish newspapers retrieved at 02.04.2004

Table 1.Public Order Crimes in Turkey

	1999	2000	2001	2002
POLICE	208.554	259.868	299.589	296.119
GENDARMERIE	36.859	61.670	151.282	226.454
TOTAL	245.413	321.538	450.871	522.573

Source: General Directorate of Security

1.2 Objectives of the Thesis

In this thesis determinants of crime are analyzed using crime and demographic data sourced from governmental institutions in Turkey. Crime related issues, such as crime prevention, and the factors that distort official crime statistics are reviewed. In the first part of empirical study crime analyses are conducted to examine socioeconomic and demographic factors that may contribute to the crime problems so that remedies can be prescribed to reduce or remove them. In the second part, Holt-Winter’s method, which is a short-term quantitative forecasting method, is applied for monthly thefts in three biggest cities of Turkey and Yenimahalle neighborhood of Ankara. One of the main objectives of the thesis is to enhance our knowledge about the cause-effect relations of crimes by examining its variances in cities. It is important to produce information on the factors that affect crime rate, because that information will influence decisions made by government institutions about crime protection. Second objective is to construct models that can be used to forecast the number of thefts in short term by using time series analysis methods. Accurate estimates of crime seasonality and detection of changes in trends are valuable for crime prevention.

1.3 Scope of the Thesis

Due to the limited data available, the factors that affect crime rate in each cities of Turkey in the period of years from 2000 to 2002 are examined. Selected types of crimes, such as murder, theft, and total public order crimes are studied. In all analytical models, I used the official statistics. The theft data covering 53-month period of the three biggest cities of Turkey (Istanbul, Izmir and Ankara), and 24-month period theft statistics of Yenimahalle neighborhood of Ankara are used in time series analyses.

1.4 Thesis Outline

The remainder of the thesis is organized as follows. Crime issues, which cover the definition, causes, and theories, are discussed in Chapter II. Literature survey takes place in Chapter III. Crime prevention, the concept of crime analysis, and necessities of precise measurement of crimes are explained in Chapter IV. Empirical analysis and findings of crime causations are presented in Chapter V. Application of a short-term forecasting tool is discussed in Chapter VI. Conclusion is covered Chapter VII.

CHAPTER II

THEORIES OF CRIME

Crime is an intriguing and complex subject. Virtually everyone has a chance to be victimized. People are concerned for the safety of their families and possessions. Crimes are unpredictable, uncontrollable, and life-threatening events. People react to crime in different ways; anger, fear, and disgust are some common emotional responses.

Crime and criminal news, subjects of great interest, receive a big coverage by televisions, radio, newspapers and books. Mass media rapidly disperse crime news throughout the nation and inform every citizen. Crime news attracts attention and seems to be reported more as for entertainment purpose than as information purpose. Since crime stories sell, the press and their readers are interested in crimes, which are visible and spectacular, have sexual and political implications. They are presented in usually violent terms, and portrayed as the result of individual deviations rather than social conditions (Chibnal, 1977). However sociologists think that criminality is not an individualistic phenomenon and should be considered as sociologic event (Demirtaş, 2001:141).

The extent to which people perceive crime as a problem depends on what kind of crime is being referred to. Using unregistered software or parking in a prohibited area are also crimes. So everyone can commit crime and be a victim. For most people, their first thought about crime would relate to images of burglary, rape and murder. Crime has an evolutionary path. According to May (1994), the definition of criminal is not static, but will change over time. Some of the crimes have not changed at all like theft and murder. On the other hand some of them changed. Until recently, it was impossible to prosecute a husband for raping his wife in England (Mason, 1992). This act was added as *crime* to the criminal code of most developed countries. Both formal and informal definitions can change over time.

In recent years, new types of crime, some of which are related to new technologies, for example computer technology, have emerged and are changing the ways the traditional law enforcement agencies perceive and handle crimes (Eskridge, 2004:1). New departments are being founded for new types of crimes in law enforcement institutions such as department of computer crimes, which will investigate and prevent the cases of hacking, publication of obscene materials, damaging databases of banks etc.

2.1 Crime Definition

At every stage of history societies forbid some acts and develop various punishments to these certain acts (Dönmezer, 1994:45). There are a lot of possible wrongs and the definition of crime varies from time to time and from society to

society and there is no consensus on what should or should not be called *CRIME*. Although most societies define theft of property as crime, there are significant differences in the way this behavior is treated from country to country. In Norway, petty theft from a relative with whom the thief lives is not treated as a crime. It is also same in Turkey. In Columbia, thieves are exempted from criminal sanctions if they can show that they or their families had a pressing need for food and clothing, that there was no legal way to meet those needs, that no violence was used to penetrate the theft, and that no more was taken than was necessary (Radzinowicz and King , 1977). To understand why one society permits such behavior while another forbids as *CRIME*, requires study of culture, values, and level of socio-economic development.

Crime has both social and legal definitions. Sociologically certain forms of deviances have been defined as crime. Some argue that deviant behavior should be considered as *CRIME*, even if no government has prohibited it by law. Crime is one of the words used to describe *the wrongs* we do others and ourselves. *Wrong* is a moral term. It represents an evaluation of acts or conditions. In this definition, in which crime becomes any behavior of which some people might disapprove. The standard is relative and gives no apparent response as to what is forbidden or permitted. In legal sense, crime refers to the acts defined by the criminal code, and prosecuted by a state. A good legal definition of crime: “ It is an intentional act or omission in violation of the criminal code, committed without defense or justification and sanctioned by the government as a felony and misdemeanor ” (Paul, 1960:10).

According to first title of Turkish Penal Code's (Act No: 765) crimes are felonies and misdemeanors and no one can be punished for the reason of an act which law doesn't regard as a crime. This concept originates from old Latin phrase, *Nullum Crimen, Nullum Poena, Sans Lege*, which means "no crime, no punishment without legislation " (Anderson and Newman, 1998:5). Felony is a serious crime with correspondingly harsh penalty. Misdemeanor is a minor offense, less serious than a felony. These definitions have a number of important consequences. First an act has to be committed before a crime can be said to have occurred; thought without some action is not a crime. Further the act must be legally forbidden; this is the unique sense in which the term *crime* is used in this thesis. Anti-social behavior in itself is not a crime unless specifically and explicitly prohibited by law.

2.2 Types of Crimes

Every country has its own criminal code system. There is a parallelism between the states' development level and the variety of crimes defined in their system. Turkish Penal Code (Act No: 765) defines 77 different types of crime. Law enforcement authorities in Turkey classify crimes in five groups. They are;

- Traffic Crimes
- Smuggling and Organized Crimes
- Crimes Against Authority
- Terror Crimes
- Public Order Crimes

The public order crimes are examined into two parts. One of them is crime against persons and the other is crime against property (property crimes). For example murder, rape, insult crimes are classified as crimes against persons. Property crimes include robbery, theft, and vehicle theft.

2.3 The Causes of Crimes

The causes and origins of crime have been a debate subject throughout history by sociologists and psychologists. As Sykes and Drabek (1969) wrote “ the cause of crime is still an intricate puzzle in social behavior, and no easy explanation will fit the observed facts. ” One of the aims of the most recent science, criminology, is to determine the grounds of crime and criminality. In most universities only social science faculties have criminology departments. Until so far crime and criminal issues have been considered as related to sociology more than any other disciplines. Recently scientists from different fields have brought different points of views to the crime, because its understanding demands knowledge across a wide range of disciplines (Clive, 1989:1). Writers and researchers from anthropology, economics, jurisprudence, medicine, philosophy and sociology have all contributed to the study of crime from different perspectives. Cullen and Agnew’s observation on the understanding of crime is supportive the multi-disciplinary characteristics of crime; “ Like much social behavior, crime is multifaceted and potentially shaped by a range of factors that operate inside and outside individuals that exist on the macro level and micro level and that have effects across various points in the life cycle ” (Cullen and Agnew, 2002:1).

Although there are no clear-cut answers, some issues known to affect crime rates are administrative and investigative strength of law enforcement agency, effectiveness of law enforcement agencies, citizen's attitudes toward crime, their reporting practices, climate, geography, cultural factors, housing level, immigration, education, recreational and religious characteristics, abandonment of religion and other traditional moral codes drug and alcohol use, economic conditions, income level, poverty level, and job availability, family conditions with respect to divorce and family cohesiveness, gang activity, more mobility commuting patterns, transportation and highway system, government policies (free market, withdrawal of public service subsidies), policies of the criminal justice system (i.e., prosecutorial, judicial, correctional), population, population density and degree of urbanization, variations in composition of the population, youth concentration, prosperity - more things to steal, relative poverty/ inequality, ethnic minorities, mass media.

2.4 Crime Theory

A theory is a systematic and logical collection of concepts and propositions, which explain events or behavior. There is a difference between research and theory. The purpose of theory is to summarize and organize knowledge and guide research. Research's purpose is to refine that knowledge (Binder and Geis, 1983:3). In other words, theories are attempts to explain events. They have two main functions: Organizing existing knowledge about a subject into a logical frame, and providing direction for future research on the topic (Vito and Holmes, 1994:5). The effectiveness or practicability of any theory lies in its validity. Theories are analyzed

and verified in a variety of ways. One method, mostly used, is to collect data in order to test the validity of the propositions (Donald, 1990:10). Some of the theories are so conceptual that it is difficult to test them experimentally with survey data. For these kinds of theories, another method is to examine their rational consistency and clarity. Without theories, scientists will be restricted in their ability to forecast the future (Adler et al., 1991:25).

Crime prevention programs should have a theoretical starting point. Since to take action without a guidance is “to take a shot in the dark”. There is no logical basis to assume that a particular crime prevention program will work. Theory obviously should provide the basic framework before action for guidance and direction. Good theory should be linked to reality through research. If the theory is combined with research, it can be a very beneficial tool for guiding policymaking. Explanations and findings from the scientific studies, guided by appropriate theory and research, can improve the ability to forecast events more precisely than through common sense (Nettler, 1984:161).

Criminality theories differ in focus. Some theories highlight the criminal; others consider social background and relationships. But there is a consensus that there is need for theories that explain particular forms of crime. Different types of crimes may be related to different social and environmental factors. Thus, different perspectives should be developed for each crime type. A theory about a rising theft rate in a particular region cannot match with the white-collar crime rate in the same region. Prevention suggestions for each case will obviously differ.

People have searched for the causes of crime. There are many theories about causes. The earliest explanations of crime heavily relied on supernaturalism. These theories were pre-scientific and depend on religious faith and belief. Causes of crime have been the subject of speculation for centuries; on the other hand systematic studies appeared only recently (Phulia, 1992:2). Criminal behavior is dynamic behavior and cannot therefore be adequately explained by the static theories. No single theory can provide all the literal explanations for the core of problem in criminology (Kelly, 2000). On the other hand, a set of theories can enlighten the most important parts of crime phenomenon. Present day theories of crime are a mixture of major currents of thought. None of the theories is considered the best one. There are four major theories, which perceive crime as a sociologic, economic and motivational phenomenon. Each of the four theories emphasizes a different side of crime. Their common feature is to take in the consideration of demographic, socioeconomic, and psychical environment characteristics. They are:

1. Strain theory
2. Social disorganization theory
3. Rational Choice Theory
4. Routine Activities Theory

3.4.1 Strain Theory

Strain theory is one of the sociological theories. This theory postulates that one of the main causes of crime is social structure. When people fail to achieve positively valued goals they become frustrated and turn to delinquency as a result

(Agnew, 1985) For example in a society in which monetary success is more appreciated than human values, high property crime rates are expected. When the gap between poor and rich increases, the poor react to the inequality. The strain theory suggests that people are encouraged to be successful especially in monetary sense and at the same time their possibility of success is restricted, this situation creates a dilemma that causes the society being exposed to more crimes. This tension is much more on unemployed people and, it is why lower classes of people (uneducated, unemployed) commit more crimes.

2.4.2 Social Disorganization Theory

Social disorganization theory was developed in the studies of urban crime by sociologists. According to social disorganization theory, the more people live in large cities, the higher country rates of theft, violence and car vandalism will be. The increase of social decay, unemployment, and illegitimate births are major reasons of crime (Akers and Sellers, 2004:160). The theory was tested in Chicago by plotting the spatial distribution of criminals and observing correlations between neighborhood characteristics and crime rates (Kubrin and Weitzer, 2003). From the perspective of social disorganization theory, Sampson and Groves (1989) concluded that five factors cause variations in the crime rates (Figure 2. 1):

1. Low economic status (unemployment, poverty)
2. Ethnic heterogeneity (minorities)
3. Residential mobility (transportation)
4. Family disruptions (broken families)
5. Urbanization (total population and population density)

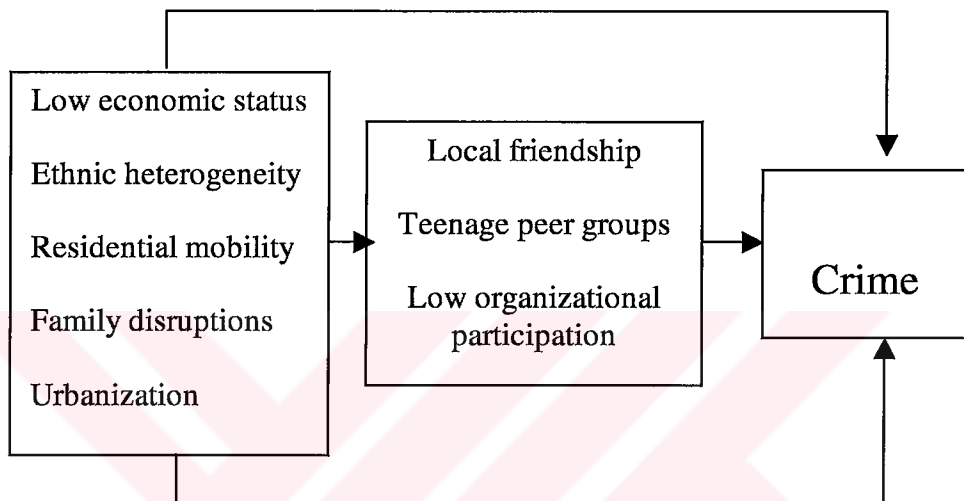


Figure 2. 1 Social Disorganization Theory of Crime

2.4.3 Rational Choice Theory

The idea of treating human beings as economic agents, who have the motive of profit maximization, is a longstanding tradition in economics. This idea presumes that individuals make rational decisions on the basis of the costs and benefits. Walklate (1998:39) notes:

Offenders seek to benefit themselves by their criminal behavior that this involves the making of decisions and choices, however rudimentary on occasion these processes might be; and that these processes exhibit a measure of rationality, albeit constrained by the limits of time and the availability of information.

In the second half of the twentieth century, economists began to devote extensive efforts to the study of crime. Sociologists mostly have assumed crimes as the acts of irrational human beings. Economists think that crimes are chosen and voluntary human behaviors. People do many of the wrongs to serve their purposes. Rationality is not a special skill; it is inherent in human nature. Everyday decisions are made based on information gathered. This theory states that rational act is a purposive act, which is done consciously. In criminology this assumption was considered radical and liberating.

Cornish and Clarke (1986) explain a criminal's decision-making process for selecting targets (Figure 2.2). Criminal's rationality may be limited by time, intelligence, and accuracy of information. Because the reasoning criminal is logical, his or her behavior can be explained, predicted and controlled. Rather than the conventional deterrent of punishment, this perspective advocates blocking criminal opportunities, or target hardening, as the primary deterrent to crime.

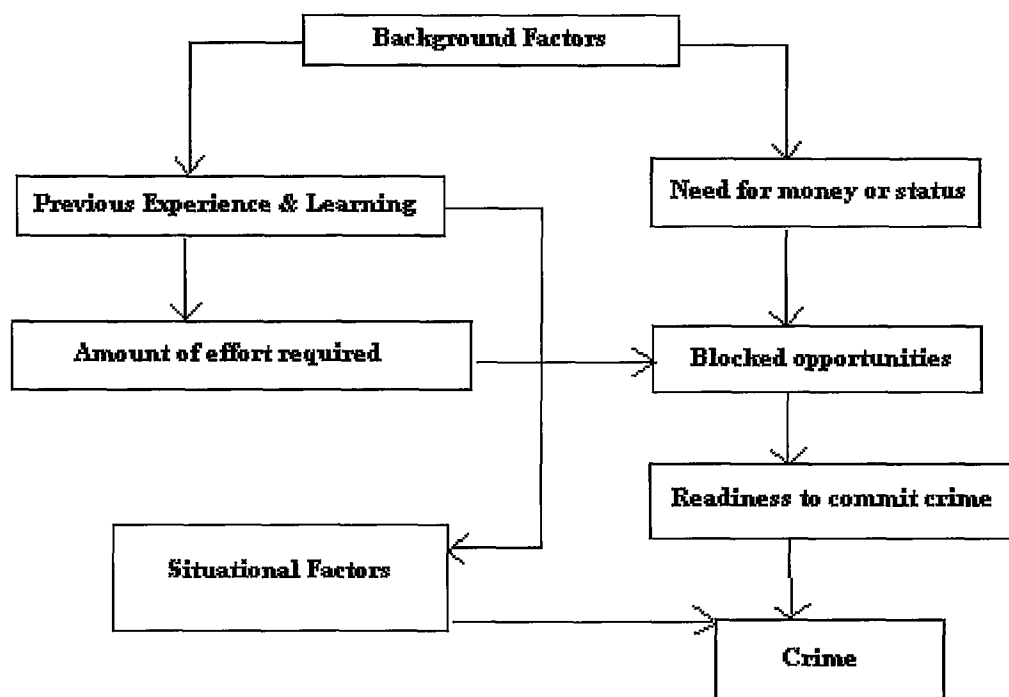


Figure 2.2 Decision For Committing a Crime

Background factors, including intelligence, social factors family background, and demographic factors.

Situational factors, including the use of drug or alcohol, the need for money, status or excitement.

Previous learning and experience, including past experiences of the criminal, comparing the past targets, criminal's self-perception of his skills.

Blocked opportunities, including the criminal's judgment of what legal ways existing for satisfying the needs.

Readiness to commit crime, including mental preparedness for action.

Table 2. Possible Costs and Benefits of Crime

Possible Costs	Possible Benefits
Probability of getting caught; probability of being punished if caught times dollar value of punishment; lost earnings.	Market value of stolen property when fenced plus money stolen.
Loss of legal income; time out from lawful occupation.	Use value of stolen property retained by thief; accumulation capital for investment in legal enterprise.
Loss of peripheral benefits of lawful occupation; paid vacation, medical insurance.	Freedom from taxes.
Job costs; learning skills and acquiring tools; payoffs to inside confederates and others; fencing.	Job satisfaction; pleasure in one's work, satisfaction of self-employment; excitement; Pleasure in being a skillful thief, heavy muscle, or racket boss.
Job risks; accident, being wounded or killed.	Security; freedom from risk of unemployment.
Work involved in loan sharking or smuggling; bird-dogging, enforcing	Leisure time; a burglar's work week versus work week of legal job available to thief
Subjective costs; anxiety about getting caught and punished, shame, guilt. How much does imprisonment and specific fine hurt? How much are time and freedom worth subjectively?	Security; free room and board, free health care, aid to dependents
Damaged repute; as thief or as unsuccessful thief if caught	Repute; as successful thief, smuggler, loan shark, heavy muscle, Mafioso

Many economists constructed econometric models to weigh costs and benefits of criminal act. All costs and benefits cannot be expressed in monetary term only. Subjective costs and benefits are also important. Inability to assign measurable values to some of the costs and benefits makes econometrists' models of crime causation more suggestive than definitive. Some of the possible costs and benefits are listed in table 2 (Nettler, 1984:178).

2.4.4 Routine Activities Approach

This theory considers crime as a function of people's everyday behavior. It is one of the place-based theories of crime, which is closely linked to the rational choice theory (Adler, 1991:205). It includes three elements; motivated offender, target suitability, and absence of capable guardian (Felson and Clarke, 1998) as illustrated in figure 3.

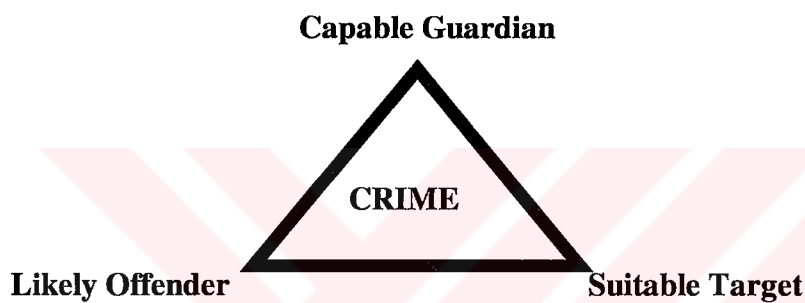


Figure 2. 3 The Basic Crime Triangle in Routine Activities Approach

These three factors can be identified in people's daily, routine behaviors and their patterning may alter the times and places in which crime occurs. Target suitability includes the form, value, visibility, accessibility, vulnerability of property and people. Small, valuable properties are more likely to be stolen than the heavy and cheap ones. The third element is guardianship effect, the presence of security personnel who can protect targets.

This theory proposes that crime occurs when motivated offenders are present near suitable targets that are not adequately protected (Cohen and Felson, 1979: 589). For example, citizens who have watch dogs, extra locks and security cameras and live in near areas to police posts are significantly less likely to be the victims of a theft. On the other hand people who live in noisy regions are more likely to be victimized (Mustaine and Tewksbury, 1998). “ The crime rates near taverns, bars, liquor stores, and bus depots are higher than those in areas farther away ” (Sherman et al., 1991). This approach can be used to understand the changes in crime rates over time and space, forecast trends, and plan future needs for personnel.

The routine activities approach suggests that the presence of valuable possessions can be associated with a high rate of property crime. In fact, rich countries encounter rapidly rising rates of property crimes (Clinard and Daniel, 1973). From 1950 to 1979 Sweden’s crime rates have increased especially in property crimes as more goods became available (Stack, 1984).

Situational crime prevention is currently very popular all around the world and takes its theoretical basis from routine activity perspective. It consists of changing the conditions and circumstances under which crime is committed.

CHAPTER III

LITERATURE REVIEW

Nobel laureate Gary S. Becker is a pioneer economist who developed a seminal model of crime (Becker, 1968). His model was based on rationality approach, which is different than the sociologists' and psychologists', who had viewed crime as irrational for centuries. From the perspective of rationality theory people generally think rational at every step they take. There are legal and illegal opportunities and people are free to choose. That is, the criminal does a cost-benefit analysis. Becker claims that before committing a crime, especially property crime, rational individuals balance the advantages of opportunity with the costs of effort, detection and punishment possibilities. The utility expected from committing a crime for an individual j defined as (Becker, 1968):

$$EU_j = p_j U_j (Y_j - f_j) + (1 - p_j) U_j (Y_j) \quad (1)$$

where,

EU_j : Expected utility from the crime,

U_j : Utility function,

p_j : The probability of arrest,

$(1-p_j)$: The probability of no arrest,

Y_j : Income, monetary and psychic, from an offense,

f_j : monetary equivalent of the punishment.

This theory postulates that as the probability of arrest rises, rational criminals will prefer legal jobs to illegal activities. On the other hand, an increase in the expected gain from illegal behavior will increase the number of crimes.

Deadman's (2001) multivariate regression models involved economic, demographic and criminal justice variables. In his empirical study he forecasted trends in some types of property crimes such as theft, burglary and vehicle theft crimes in England.

Alison (2002) used regression analysis involving deterrence, economic and demographic variables in his study of crime rates in America. He concluded that more police should be employed, and young people should be oriented towards legal activities.

3.1 Economic Factors

3.1.1 Unemployment

The relationship between crime rate and unemployment rate is intuitively assumed to be positive. On the other hand, so far studies have showed that there is no clear-cut answer for the correlation between crime and unemployment. Box identified negative relationship in 19 studies and positive correlation in 33 studies (Box, 1987). Aggregate data showed that fluctuations in the unemployment rate are no more than weakly related to the rate of crimes. A review of ten studies, done before 1975, found that seven of them revealed no significant relationship between unemployment rate and crime rate (Gillespie, 1975).

Some people consider crime as a source of income. They are professional criminals. They would not work even if jobs were available, and so a higher unemployment rate would not affect their criminal activity (Sviridoff and Thompson, 1983).

The unemployed suffer poverty and they have more time in criminal activities (Dnes, 1999:74). The local unemployment rate describes individuals' opportunities to get a job (Eide, 1999). People, who are unemployed are much more likely to be arrested for or convicted of crime than employed people (Belknap, 1989).

Reilly and Witt (1996) found some significant positive correlations between crime and unemployment rates in England. Raphael and Rudolph (2001) found an important positive effect of unemployment rate on crime rate. Thornberry and Christenson (1984) agreed with the conclusion that unemployment induces crime.

Fleisher (1966) and Ehrlich (1973) found a significant crime-inducing impact of income inequality. In their empirical studies they found that the effects of both unemployment and income inequality are positive and significant; on the other hand unemployment rates are less important than income levels and distribution.

Farrington (1986) showed that property crime rates were higher when offenders were unemployed. Criminals tend to have poorer work records and higher rates of unemployment than non-offenders (Freeman, 1983: 106). A more recent study has contradictory findings. The study made by Imrohoglu, Merlo and Rupert (2001) predicts that 79 % of the people engaging in criminal activities are employed and 21 % are unemployed.

Some researchers like Cohen and Felson (1979) surprisingly claim that unemployment rate reduces crime rate. Because of the guardianship effect unemployed people who do not go to work prevent property crimes and diminish regional crime rates. Criminals will not break into houses in which people are present.

As reviewed by Freeman (1994), time series studies have failed to uncover a positive and significant relationship between unemployment and crime. Chamlin and Cochran (2000) proposed that unemployment is mis-measured. This is the main reason for not observing a meaningful correlation between unemployment and crime. They used duration of unemployment in their empirical analysis to correct the mistake. They found a very strong positive relationship between criminal activity and the long-term unemployment.

3.1.2 Income level

As the citizen's average income increases the net gain from property crimes are expected to be greater and crime rates increase. On the other hand better income will increase the cost of crime. That is, people who have sufficient level of quality of life, will pay great attention not to go into the jail.

Fleisher (1966) and Ehrlich (1973) were pioneers in studying the effects of income levels and income disparities on the incidence of crime. As argued by Fleisher, the theoretical effect on crime of higher levels of average income is unclear, because both the opportunity cost and the expected payoff from crime are correlated with income. Fleisher's and Ehrlich's empirical findings about the effects of income levels are mutually contradictory. Fleisher found a negative relationship between city average family income and young males arrest rates, while Ehrlich found that higher state median family incomes were associated with larger rates of violent and property crimes.

There is some evidence of a positive relation of income inequality and crime (Long and Witte, 1981; Orsagh and Witte, 1981). Gould, Weinberg and Mustard (1998) and May (1999) agreed that very low wages are likely to increase crime rates.

3.1.3 Education

Another important factor related to the effect of economic conditions on crime is the level of education of the population, which can determine the expected rewards from both legal and illegal activities.

There is a huge literature about the education level of offenders. Wilson and Hernstein (1985) concluded that criminals are less educated than non-criminals. Witte (1997) reviewed the literature on education and crime and discussed some models that suggest possible crime reducing impacts of education. After examining past two decade's studies on education and crime, she concluded that the empirical evidence regarding the effects of education on crime was limited.

In a recent work, Lochner (1999) developed and estimated a dynamic model in which he covers three activities; work, investment in human capital, and crime. He found that education, training, and work subsidies could reduce criminal activity.

According to Freeman (1991), criminals are from poorer families than others. Thus, one could expect that areas with higher average educational levels should have a lower incidence of crime. Ehrlich (1975), however, found that property crime rates were positively and significantly related to the average years of schooling of the population aged 25 and over, even after controlling for income inequality and median

income. The writer explained his empirical finding as; education may raise productivity in illegal activities to a greater extent than in legal ones; higher average levels of education may be associated with less underreporting of crimes and with wealthier potential victims, and finally, higher average levels of education may go hand-in-hand with more pronounced educational inequities.

Some researches viewed education from a different perspective, which is time allocation. Tauchen and Witte (1994), for example, found that for a sample of young men, the act of going to school and/or work reduces the probability of committing criminal acts, even if a high school degree does not have a significant effect on that probability. The same finding is reported by Tauchen et al. (1994), who find a negative relationship between crime and variables for the time at work and at school, but no significant effect of educational attainment on arrest rates. According to Gottfredson (1985) and Farrington (1986)'s studies, time spent in schools significantly reduces criminal activity. Grogger (1998) found no relationship between crime rates and education level.

Education can make people less impatient and less risk averse and reduces propensity to commit crime. According to an empirical study, high school graduation reduces crime (Lochner and Moretti, 2001). Usher (1997) found that education can create more civilized people which causes reduction in crime rates. According to him students are taught to be beneficial people to society .

3.2 Deterrence Factors

3.2.1 Police Workforce

It is generally supposed that an increase in the officers' number will cause the crime rates decline. Erlich (1973; 1996) concluded that the police presence has negative effect on crime rate. Levitt (1998) agreed with him that all deterrence variables including police per capita have a significant impact on crime rate. Grogger (1991) found that in order to reduce crime rate, the probability of arrest (police per capita) is more effective than the length of the punishment.

On the other hand Niskanen (1994) found that there is strong positive relation between the reported crime rates and the number of police per capita. More police would probably increase the reported crime rate, even if they reduced the actual crime rate. Police workforce positively correlates with crime, since it is an endogenous variable. In most of the empirical studies, this is a common finding (Becsi, 1999).

Anderson and Joaquin (1996) tried to determine the change in eight different types of crime rates by employing 655 new police officers in the city of Houston. They concluded that the rate of murder and rape remained the same; on the other hand, there were considerable decline in robbery, burglary, theft, and motor vehicle theft rates.

3.2.2 Clear Up Rates

One of the deterrence factors is *clear up rate*, which is a measurement of law enforcement agency's effectiveness. A crime is categorized as a cleared up event when satisfactory data is produced about the offender's identity. Identifying offender is considered as important as catching them.

When the clear up rates increase, the offenders' perceived probability of arrest also increase. Crime rates are expected to go down since the criminals' expected gain from crimes will decline. Drake and Simper (2002) found a negative non-linear relationship between the crime rates and clear-ups.

Ehrlich (1973) tried to test the deterrence hypotheses and found that, like (Grogger, 1991) the probability of conviction has more deterrence effect than the severity of the punishment on criminals. Kenneth Wolpin (1978) also concluded that crime rates were negatively correlated with the probability of conviction.

3.3 Demographic Factors

3.3.1 Urbanization

Crime is considered by many researches as an urbanization phenomenon. According to a regression model made by Glaeser (1999) connection between crime and city size is very strong. Some reasons of higher crime rates in highly urbanized cities are lower probabilities of arrest and recognition, and lower underreporting

habits of citizens. There is a strong correlation between crime and urbanization. (Becsi, 1999)

3.3.2 Population Density

Crime rates are expected to be high where population density is high. O'Brien et al. (1980) classified property crimes and non-property crimes into two categories from the victimization perspective; crimes with contact and crimes without contact. They defined the crimes as *crimes with contact* when the victim was present at the time of crime occurrence such as theft by snatching or battering. *Crimes without contacts* are the crimes when the victims are not at the scene of crime such as automobile theft. They found that population density is positively related to property crimes with contact and negatively related to non-property crimes and property crimes without contact.

3.3.3 Age

Young men commit crime more than women and old people (İçli,1993:62). Recent papers have argued that some trends in criminal rates can be explained by the age-structure of the population, particularly the proportion of young males who are purported to be prone to violence (Blumstein and Rosenfeld, 1998). Age structure, which is measured as the proportion of age of 15 - 29 years old men in population, may affect positively the crime rate. (Cooter and Ulen, 2000:457).

As Moffit observed "Actual rates of illegal behavior soar so high during adolescence that participation in delinquency appears to be a normal part of teen life"

(Moffit, 1993:675). Some findings from the study of Witte are surprising. His study indicated that 90 percent of young males and 60 percent of young females have participated in criminal acts by the time they are 18 in U.S.A. (Witte, 1997).

3.4 Time Series Models

Various types of time series models have been developed to forecast crime rates in short-term horizon. These models attempt to predict future crime levels based on historical data available. Time series data consist of observations taken regularly over time. Time series models are different than casual models; they use data for only the variable, which is to be forecasted. On the other hand the behavior of the forecast variable is explained to some degree by one or more predictor variables in a casual model (Cavanos and Miller, 1993:686).

Seasonality of crime is not a new concept in literature. Over 150 years ago in 1842, The Belgian mathematician Adolphe Quetelet formulated his *Thermic Law of Criminality* by claiming that “crimes against the person increase, and crimes against property decrease, with seasonal and geographic increases in temperature” (Cheatwood, 1988). Since then, many researchers and academicians have studied the seasonality of crime. Seasonality studies often indicated that property crimes peak in the fall and winter and crimes against persons peak in the summer months (Baumer and Wright, 1996). Most of these studies are at national levels. According to Sherman et al. (1989) at this level, variations of crimes will be smaller, for that reason they concluded that the smaller regions` studies would be more useful in forecasting crimes.

McPheters and Stronge (1974) found seasonal variations in crime data in Miami. They recommended that police operations and planning implications should be adjusted for the seasonal variations in crime data. Monthly data were used in their study. Farrell and Pease (1994) examined seasonality of residential burglary in Merseyside, England from 1988 to 1990.

Cohn and James (2000) examined the seasonality of three property offences; burglary, robbery, and larceny-theft. They hypothesized that temperature and time of day could be used to predict these offences. The hypothesis was tested by a time-series analysis. The official crime data of Minneapolis police for a 2-year period are used. They found that temperature as a significant predictor of property offences. In more Minneapolis crimes were reported during summer than other months.

Hakko (2000) studied the suicides and homicides in Finland. She found that the seasonality of homicides in the country indicated statistically significant peak in summer and a trough in winter.

The population of tourist resorts such as Bodrum and Marmaris may change significantly in different times of the year, which may cause seasonality in crime numbers.

CHAPTER IV

CRIME PREVENTION

Although there exist international variations on crime rates, most western societies perceive crime as an important social problem (Hough and Mayhew, 1985). Almost there is no crime-free area in any part of the world. Common belief is that crime must be eliminated totally from society, on the other hand, French socialist Emile Durkheim wrote about the normality of crime (Vito and Holmes, 1994:10):

Crime is present not only in most societies of one particular species but also in societies of all types. There is no society that is not confronted with the problem of criminality. What is normal is the existence of crime.... crime is normal because a society exempt from it is utterly impossible. Even a community of saints will create sinners.

Obviously Durkheim didn't mean that it was desirable and acceptable to commit crimes. Rather he was pointing out that if there is conformity, there will be also deviance, even if it is impossible to stop crimes to the zero level, the government should take measures to minimize it for the welfare of the society.

It has become a common idea in regard to health that it is better and easy to prevent disease than to cure it. From this perspective crime prevention should be given the top priority. According to Schwabe et al. (2001:14):

The most valuable activity that institutions (governmental or non-governmental) carry out, is crime prevention for the welfare of society as a whole. If crimes are successfully prevented before they occur, the societal costs and suffering associated with the effects of crime are completely avoided.

Law enforcement agencies carry the most visible part of the crime prevention concept. The law enforcement authorities of Western countries realized the importance of crime prevention units in 1960s. Community policing units are at the preparation stage in Turkey and expected to be commenced in near future. The reasons for the superiority of prevention are evident. In the first place, prevention is easier than reformation.

The main objectives of criminal justice fall into two key purposes in both short range or long range; first one is to control crimes by solving crimes, arresting suspects and processing and imprisoning offenders and second one is to prevent crimes before occurring. The crime control objective deals with the immediate situation and attempts to discovery of past criminal behavior, whereas crime prevention is forward-looking, forecasting and forestalling future crimes by present interventions (Anderson and Newman, 1998:25). The most logical policy is the policy of prevention. Punishment is a defense; prevention is a offense method (Sutherland, 1966: 618).

The crime prevention has been defined by National Crime Prevention Institute of U.S. (1986) as “the anticipation, recognition, and appraisal of a crime risk, and the initiation of some action to remove or reduce it.” Crime prevention can be classified by its consequences such as number of criminal events, number of offenders, the cost of total harm to society and individuals and etc. (Sherman, 1996). For the evaluation of crime prevention programs, each one of the consequences can be important separately. Crime prevention initiatives are obviously more likely to be successful, if they are directed at specific crime problems (Gearson and Wilson, 1988:13). There are three perspectives in the current crime prevention concept (Perigut, 1981:13 and Shaftoe, 2002). They are:

1. Corrective Prevention: This approach suggests that in order to prevent crime governments should improve the bad social conditions which induce crimes, such as reducing overcrowding, unemployment, re-establishing slums and increasing the numbers of health centers and educational institutions. Reducing the motivation of criminals will be more meaningful. “The most effective way to prevent crime is to ensure healthier children, stronger families, better schools and more cohesive communities. Crime prevention through social development is a sound investment.” (Telegdi, 1996). A study made by National Crime Prevention Council of Canada showed that corrective crime prevention resulted in less violent behaviors, safer communities and remarkable cost savings in the law enforcement spending and in almost every area of government and private expenditures.

2. Punitive Prevention: This approach emphasizes much on the deterrence effects such as law enforcement units, police, courts, prisons and the legal system to discourage people to commit crimes.

3. Situational Crime Prevention: The physical security or design of buildings will be very effective in reducing crimes. It has two parts as mechanical prevention and environmental prevention. Mechanical prevention emphasizes hardware such as locks, doors and grilles. Environmental prevention manipulates building design and the relationship between buildings and their environment to reduce opportunities for crime. Situational crime prevention involves measures aimed at very specific forms of crime as to reduce the opportunities for crime and increase its risks as perceived by most of the possible offenders (Clarke, 1983:225).

Regardless of the type of the crime prevention type, rational choice and routine activity theories provide the framework to create a crime prevention system, which will reduce the property crime rates, eliminate the fear of crime in society, and increase the life quality of citizens. (Vellahi and Nahoun, 2001:61) Some key generalizations are as follows:

- Crime is not random, nor uniform.
- Crime is patterned and predictable.
- Crime is committed by reasoning criminals.
- Crime is end result of a decision making process.
- Crime opportunities are actively and passively searched during daily activities.
- Crime occurs when motivated offenders meet in time and space with suitable targets with ineffective guardianship.

The two theories suggest that effective strategies of crime prevention should have as their primary aim to counteract the motives for deviance, reduce the temptations, tighten the opportunities and harden the targets (Fattah, 1999). After adding the propositions of strain theory and social disorganization theory to the framework of these two theories a conceptually perfect crime prevention program can be designed. According to formulations derived from the set of four theories, preventive efforts are designed to influence the costs, benefits, incentives, and opportunities for future criminal activities. Crime prevention efforts include raising the cost of crime by deterrence factors, eliminating motivational incentives, as well as decreasing the benefits and opportunities of it (Walters , 1992:141).

Crime prevention is one of the most important parts of law enforcement activities. The agencies, which aim at crime prevention, use some functions such as surveillance, offender tracking and crime analysis (Schwabe et al, 2001:13). Law enforcement agencies have to develop crime prevention strategies. There are five steps in developing and implementing the preventive process of a strategy (Figure 4.1) (Ekblom, 1988).

1. Obtaining data (crime measurement)
2. Crime analysis
3. Devising preventive measures
4. Implementing the chosen strategy
5. Evaluation

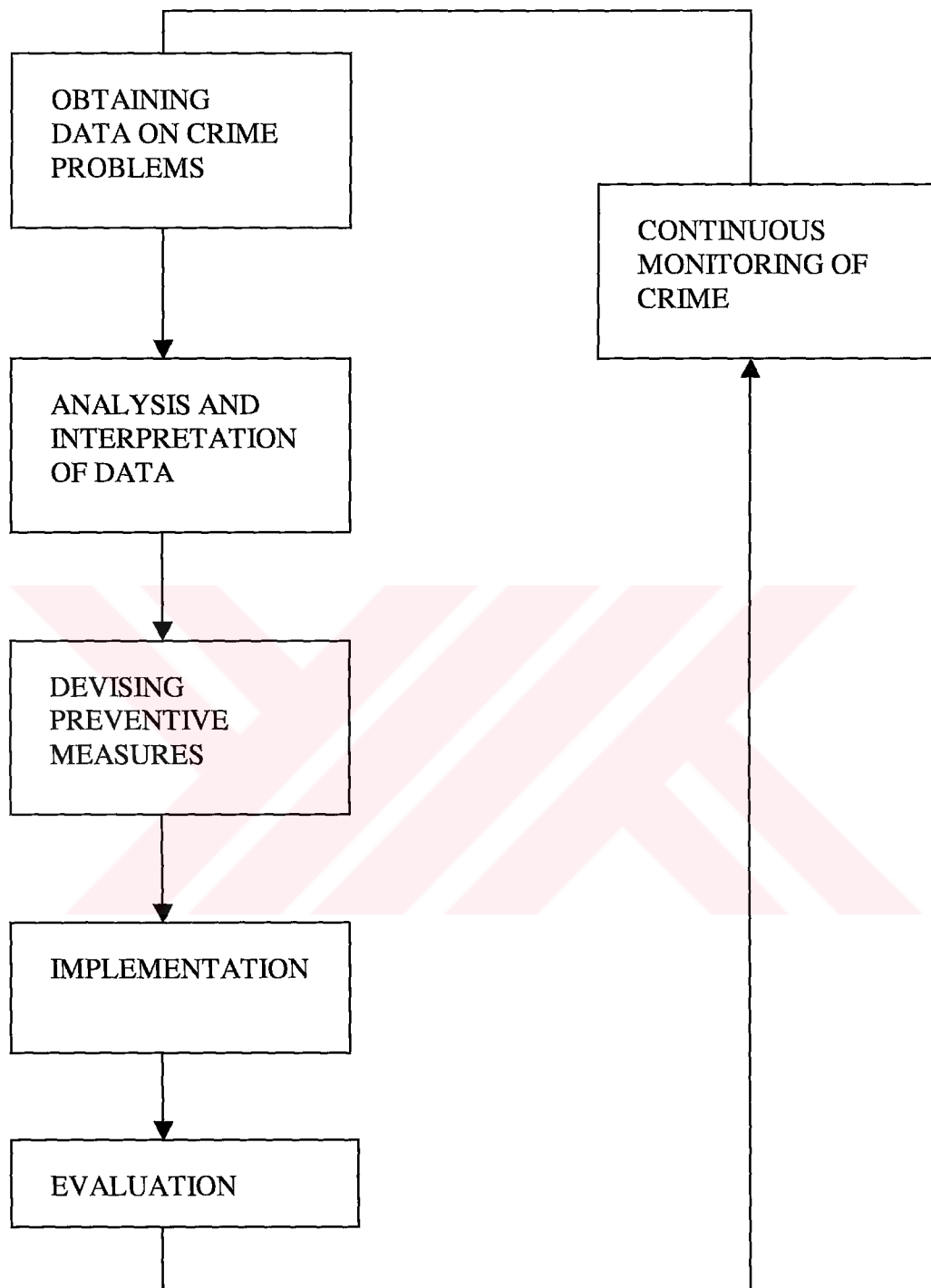


Figure 4.1 Preventive Process

4.1 Measuring Crime

Obtaining systematic information about crime has long been a matter of concern to criminologists who generally look for crimes in two different periods and study the latter, and discover what differentiated it from the former. This study enables them forecast crimes to take measures, if possible to cure. In order to evaluate theories of criminal behavior and crime prevention programs crime must be measured (Elsmore, 1995). There are four reasons for measuring crimes, criminals and victims. They are required for purposes of description, risk assessment, program evaluation, and explanations (Nettler, 1984:36).

1.Description. Recently government officials and sensitive citizens have been interested in the moral and psychological health of their communities and countries more than in the past. Governments periodically announce and publish the crime statistics for public information (Reiner, 1996).

2.Risk assessment. Measures of criminal activity among different kinds of crimes in different zones permit an estimate of the relative risk of encountering, which is the probability of becoming a victim. People who would live or invest in a particular region use the risk assessment.

3.Program evaluation. There are three main responses to crime, which are rehabilitation, incapacitation, and deterrence. To discover how much any of these responses is effective it is essential to measure crimes.

4.Explanation. Identifying causes of crimes is very important. The search for causes requires facts. Criminologists can do it by relating differences in crime rates to differences in people and their situations. Crime statistics have been used to measure the extent of crime in society for research purposes (Maxfield and Babbie, 2004:145) They are used as a basis for explanations of crime by seeking to correlate levels of crime statistically with levels of other phenomena, such as unemployment (Jupp, 1989: 47).

Governments in developed countries have been working to perfect data collection techniques, since it is very important of data for research, policy making, planning of criminal justice system (Adler, 1991: 24). In some countries crime statistics are used for law enforcement agencies' efficiency (Reiner, 1996). Law enforcement workforce are allocated on the basis of how much crime is recorded in a community, and thus mistakes in crime reporting from one area to another could lead to a misallocation of resources (Conklin, 1989: 78). Through the years these methods have been increasingly more sophisticated. Questions about how researchers measure crime and what those measurements reveal about the nature and extent of crime are among the most important issues in measuring crime data.

4.2 Crime Data Sources

Most European and North American countries have constructed databases for crime and criminal statistics covering the past 150 years. Different from western countries, in Turkey, detailed crime statistics dating back to foundation of Turkish Republic are not publicly available. This is one of the major obstacles for scientific researches on crime and criminal issues. Official court statistics were publicized in

annual reports right after 1937 in separate booklets as court and criminal statistics. The publicized official statistics basically were aimed to give an idea about the workload of criminal justice system more than the crime rates and causes of crimes (Dönmezer, 1994:30).

Turkish General Staff of Gendarmerie, General Directorate of Security and one of its subordinates, the Division of Smuggling announce past two years` crime statistics on their official web pages. The data on Internet are not detailed enough for scientific researches. On the other hand, public relation departments deliver crime data based on request.

4.3 Crime Statistics

Every measure of crime underestimates its actual amount. The assumed, but unknown, quantity of criminal activity is called the dark figure of crime. Various self-report studies have found that at least 40 percent of people confessed to having committed at least one crime throughout their life (Maguire, 1994:223). Crime statistics are the subject of much dispute and controversy. The problems arise about what kind of statistics should be collected, who should collect them, how accurate they are, and most generally what they mean. Crime statistics are one of the less reliable social science statistics. Total crime statistics are equal to official crime statistics plus unrecorded and unreported crimes.

$$\text{TOTAL \# OF CRIME STATISTICS} = \text{\# OF OFFICIAL CRIME STATISTICS} + \\ \text{\# OF UNRECORDED CRIMES} + \text{\# OF UNREPORTED CRIMES}$$

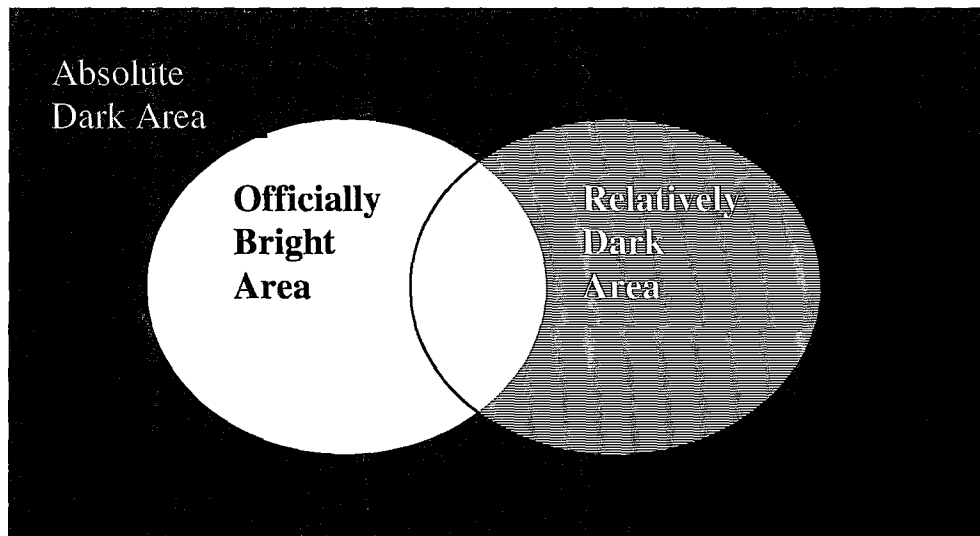


Figure 4.2 Crime Universe

Figure 4.2 depicts hypothetical crime universe. Basically crime statistics are classified in two parts; official statistics and non-official statistics. Official crime statistics are crimes, which are recorded by law enforcement units. It is shown in the figure as *Bright Area*. (Demirtaş, 1991:82) The imperfect nature of official statistics on crime has led researchers to invent other ways of counting violations of the law. Unofficial numbers are supposed to be more accurate data of crime. Unofficial procedures for counting crime include observations of criminal activity, private policing activities, test situations, surveys of victims and studies of admissions of crime. One of them is victim survey which measures the extent of crime by interviewing individuals about their past experiences. *The Relatively Dark Area* represents the crimes, which can be discovered by the studies. As it is seen in the hypothetical figure most of the crimes lies in the *Absolute Dark Area*, which stands for the past crimes, which will never be discovered.

4.3.1 Recording Problems

Law enforcement agencies in two ways generate official statistics on crime; in response to complaints made to them and through their own surveillance. In both cases a decision is made whether a crime was committed or whether it is worth acting upon.

There is a well-justified concern that the quality of official crime statistics is jeopardized by the selectivity with which crimes may be recorded by the criminal justice system; crime statistics could be measuring *the behavior of officials* and not of crime. (Gottfredson, 1986: 256). For example, in El Salvador, the office of the country's chief prosecutor only records crimes for which there is an indicted suspect (Cruz et al. 2000).

When the law enforcement agencies are informed by an act, they classify it and often redefine what may have taken place before *recording* (Sparks et al. 1977:6). The five- stage recording process is as follows (Adler et al., 1991:33):

- 1.Perception
- 2.Definition
- 3.Reporting
- 4.Redefinition
- 5.Recording

Information about crime may be lost at any point along this processing route. For example, as Mayhew and Hough note, the law enforcement may think that a reported crime is a misinformation, or there is not enough evidence to support the report (Hough and Mayhew, 1985).

The vigilance with which law enforcement responds to complaints and records is an unknown variable. Vigilance varies with the organization of law enforcement, with the discipline of its personnel and the interpretation of numbers by auditors. Since if these figures are used as a measure of law enforcement performance, these units can improve their paper performance by misclassifying or even failing to record citizens' complaints (Ericson, 1981).

Some law enforcement agencies want to observe high rises in crime rates, because these numbers can be used to inflate their budgetary requirements, whereas other agencies prefer decreases, they can point to these as indicators of a hard working (Binder and Geis, 1983:110). If clear up rates are targeted, law enforcement agencies tend not to record crimes until it has been solved (Elsmore, 1995). For that reason crime rates are generally improper as a means of measurement.

Law enforcement officers generally hate filling crime reports (Skogan, 1975). Observers have noticed that police are less likely to register a complaint, if the complaint is abusive and hostile. They may also decide that it is a matter that can be settled more easily outside the formal system as it happens in most traffic accidents. Some scholars suggest that the police show special leniency toward offenders in domestic assaults, as they see a family problem and can be solved outside the system

(Dobash and Dobash, 1979). Women mostly take care of children. Law enforcement officers, who feel sympathy for mothers even if they commit petty crimes such as threat and insult, do not record some of their crimes (Doğansay, 2003:46). Law enforcement agencies can let a young criminal go after an oral warning (Mason,1992). The police can be reluctant to spend time with the surveillance of juveniles. Since the police are not allowed to take the statements of them. Only prosecutors can do it. This means extra work for law enforcement officers by taking the young criminals to the courts. After all exhausting efforts mostly the young criminals will be free at the end of trials.

Official crime statistics mainly give idea about law enforcement agencies style of the work and priorities on the way to fighting crime. Law enforcement agencies sometimes may ignore some minor crimes such as drug users, thinking that such arrests can scare the top organizer criminals in which police are especially interested (Skolnick, 1966: 20). If the minor criminals are a source of intelligence, the officers will not arrest them. Another example if law enforcement focus on a certain type of crime like drug users, then that specific crime's rate will certainly rise. If the society perceives a difference between arrest rates and the perceived crime rates, the citizens will conclude the existence of a corruption in law enforcement agency for not doing their job on purpose.

Official statistics emphasizes public order crimes and traffic crimes. The focus on these crimes distorts the other type of crimes` statistics such as white-collar and organized crime. The detection of these kinds of crimes is very difficult. Law enforcement units usually don't have manpower to deal with these specific crimes.

Sophisticated types of business crime, fraud, cheating on papers, dirty money laundering, etc. have proven to be difficult to detect and even harder to investigate and prosecute (Fattah, 1999:131) . Law enforcement agencies only detected 1.5 percent of crimes, which violate the industrial legislation (Robertson, 1971).

Related to improvements in communication industry and networks, currently reporting crimes are easier than past (Elsmore, 1995). Institution of new record keeping procedures can also create significant changes. For example, in New York robbery rate increased 400 percent in one year due to the system change in recording. (Katzenbach, 1967:25).

The positive effect of more police on the reporting rate, however, appears stronger than the negative effect on the actual crime rate over a wide range of numbers of police. For most jurisdictions, more police would probably increase the reported crime rate even if they reduced the actual crime rate (Niskanen, 1994).

4.3.2 Reporting Problems

Citizen's complaints are the second main source for constructing actual crime rates. This means that the amount of crimes " known to law enforcement " will fluctuate with changes in citizens' habit of reporting crimes. It is possible, then, that crimes known to law enforcements may increase, not because more crime is being committed, but because more crime is being reported. The citizens' crime reporting habits can closely be linked with attitudes toward the law enforcement agencies.

A hypothetical example shows an actual total crime rate that is constant over time (Conklin, 1989:77). Figure 4.3 depicts the increase of official crime rate without any change in the actual crime rate. At time t_1 , some of this total amount of crime is reported and some of it is underreported.

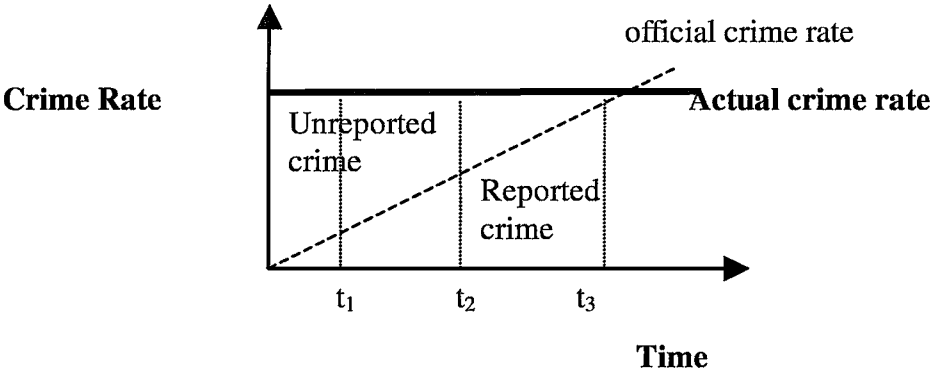


Figure 4. 3 Hypothetical Example of Changes in Crime Rate Over Time

The reported crime rate has increased and the amount of unreported crime has decreased at time t_2 , although the actual total crime rate didn't change at all. By time t_3 , the official crime rate and the actual total crime rate are the same. If citizens change their reporting habits and begin to report crime that they previously didn't or the police begin to record all the crimes they learn. If this happens, official crime rates rise without any increase in the actual total crime rate. According to William A. Niskanen, in the United States crime rates are much higher than that reported to police, but has probably not increased over the past 20 years (Niskanen, 1994).

Soares (1999) found that underreporting crimes are common in less developed countries due to three reasons; the quality of law enforcement agencies, judicial systems and education levels.

Crimes, which are more obvious and more serious and have complaining victims or dead ones, are counted. It involves reaction rather than surveillance. People fail to report crimes to the law enforcement for many reasons, the most significant of which have to do with the nature of the crime incident itself. Victims are least likely to report (Block and Block, 1980) if;

- Offences that are attempted rather than completed,
- Offences in which there is little or no financial loss or physical injury,
- Offences that do not threaten their sense of personal security,
- Offences that do not seem serious to them,
- Offences in which no firearm is used.

In order for a crime to be “known to the police”, the act first must be perceived by an individual (the car is not in the garage where it was left). Offences will only be reported if the victim is aware of his or her victimization. For example people can think that they lost some items, which in fact were stolen by thieves without any evidence (Elsmore, 1995). In this example a theft occurred, but was not reported to the police. The victims have at least one of three reasons for asking for help of the police; protection, stopping an ongoing attack, avoiding future attacks of the same criminal (Gottfredson and Gottfredson, 1987).

According to a research conducted by Mayhew et al. (1998), the decision to report a crime depends upon a whole range of factors, including the place where it took place, and the identity of the offender. Many victims who believe that law enforcement can do nothing about catching the offender and bring back the lost

property do not report (Lea and Young, 1986). Some victims are afraid of what law enforcement might discover when they investigate crime. Victims may be restrained from calling the police, if they have engaged in illegal or suspicious activities (Black, 1983). Thus, a drug dealer may not report crime or a businessman, who was robbed by a sex worker, can hide the theft. If the victim believes that the offender has the ability of reprisal cannot report to the law enforcement. Some crimes are unreported, because victims believe them to be private or family matters. Singer (1988) examined reporting habits of victims for violent crimes including assault, robbery, and rape and found that fear of reprisal was more frequently given as a reason for non-reporting when victims knew the offender or the offender was husband. According to a research conducted by Stanko (1990), women tend to hide and conceal domestic experiences often fearing the physical, emotional consequences of reporting. Cross national surveys examined the effect of sex and age on reporting habits of citizens, according to findings females report more crimes than men, and the elderly are more likely than younger people to report crimes that they witnessed (Skogan, 1984). The reason can be that men tend to be stronger than women and more skillful in physical struggle (Felson, 1996). As a result, female victims should be more likely to call the police for protection than male victims. The perceived danger can be different between sexes. Men who have been assaulted may view the offense as less serious than women who have been assaulted (Kanekar, 1981).

Surveys of interpersonal violence suggest that victims are less likely to inform the police when the offender in a violent incident is a partner or other family member than when he or she is a stranger (Gartner and Macmillan, 1995). Children, who are sexually abused by their parents or relatives, do not tell anyone what is

happening. One of the reasons of silence is the offender is not a stranger (Mason, 1992).

Victims may avoid going to the police because of the opportunity costs. Although a phone call requires little time and effort, involvement in the legal process (attending courts) can involve substantial costs (Greenberg and Ruback, 1985). Witnesses may not want to report crimes for inconvenience reasons. Crimes at workplace mostly are not reported for fear of losing jobs (Croal, 1992).

Motor vehicle crime has high rate of reporting. It is a consequence of the necessity of filing a complaint to make an insurance claim (Nettler, 1984:71) or the probability of the vehicle's involvement in more serious crimes. Even when people have insurances they do not report minor losses, because of fear of rate increase in their future insurance policy (Reiss, 1969:19).

Macdonald (1998) found that unemployed people and people who have committed crimes over the past year are less likely to report burglaries. Department of Public Safety (2000) examined the factors that affect the crime report rates in Texas. They are listed as:

- Public attitude towards law enforcement and crime,
- Size, demographic composition of an area, stability and seasonality of the population, the level of commuters,
- Economic status and unemployment rate in the area, cultural conditions,
- Family and community values,

- Standards, practices, and relative strength of the law enforcement agency(s),
Law enforcement agency's administrative and investigative efficiency,

Citizens report crimes not only to the law enforcement agencies, but also to public institutions. Citizens' confidence plays a big role in selecting the institution to report the crimes (Kaufmann et al., 1999). A study performed in the police area of Istanbul with a sample of 1147 cases tried to determine which institutions citizen prefer for reporting crime (Dönmezer and Yenisey, 1998). The distribution of percentages is depicted in table 3. Findings are interesting, since police forces had only 48 percent of the all cases as the initial informed institution.

Table 3. Survey Results of Institutions that Citizens Prefer to Report

Institution	Complaints	%
Police	560	48
Public prosecutor	398	34
Exchange manager	37	3.2
Major	18	1.5
Gendarmerie	12	1
Municipal uniformed units	7	0.6
Banks	6	0.5
Governor of province	4	0.3
Health institutions	3	0,2
Others	102	8.8
Total	1147	100

In developed European countries reporting rate of crimes is 90 %. This rate is 30-40 % in Turkey even though Police and Gendarmerie have toll-free numbers (155 and 156). According to a survey conducted by Aksaray Police College, only 31 of the citizens out of 100 report the crimes that they witnessed (Çalı, 2003: 52). It

should be considered as indication of problem between police and community. Communication and trust problems, long waiting time of processes can be possible problems

4.4 Crime Analysis

Modern police force was firstly formed in 19th century. Sir Albert Peel advised police to keep records to enlighten public and to organize the allocation of police forces in England (Gaines, 1999). He can be considered as the first crime analyst. It has been well understood since then, that crimes are not random, isolated and unconnected incidents. A group of people seeks for best opportunities to commit crime and each crime has a chance of being related to a former one. This perspective enabled law enforcement agencies to identify the similarities of crimes and solve them. Crime analysis is described in the handbook of London Police (Buck, 1973):

All officers perform informal crime analysis, in its simplest sense, as they investigate crimes. Crime analysis is the quality of examining one crime occurrence and comparing it with similar past events. In essence, the officer is a walking crime analysis unit as he compares his investigations with his past experiences and with the experiences of others.

In a leading textbook (Gottlieb, 1994:13) crime analysis is defined in a broader sense:

It is a set of systematic, analytical processes directed at providing timely and pertinent information relative to crime patterns and trend correlations to assist operational and administrative personnel in

planning the deployment of resources for the prevention and suppression of criminal activities, aiding the investigative process, and increasing apprehensions and the clearance of cases.

Law enforcement agencies perform data analysis to refine and distribute useful data. Data analysis of crime include crime counts and trends, pattern and series identification, manpower allocation, beat configuration, and crime mapping (O'shea and Nicholls, 2003). Crime analysis has three major purposes (Reuland, 1997):

- to assess the nature, extent, and distribution of crime in order to efficiently and effectively allocate resources and deploy personnel,
- to identify crime-suspect correlations to assist investigations,
- to identify the conditions that facilitate crime and incivility so that policymakers may make informed decisions about prevention approaches.

As in Rueland's words, crime analysis is not only vital in controlling crimes, but also for developing and implementing crime prevention strategies. Crime analysis is the autopsy and the logical examination of crimes, which provide solutions by enhancing crime prediction capabilities and developing proactive approaches to security and prevention (Vellani, 2001:2). Analysts focus on identifying locations, time of the day or situations in which crimes appear to cluster so that efforts to harden potential targets can be initiated. These analyses may lead to recommendations for changes in the physical structure of buildings or in the actions of potential victims (locking doors, hiding valuables) to make them less likely targets of crime.

Analysis is a thorough examination of characteristics of the crime problem. “Analysis requires the detailed information about offenders, victims, and others who may be involved in a problem, the time, locations, the physical environment. The motivations, gains and losses are important ” (Goldstein, 1990:36-37). Data analysis can make agencies understand the root causes of crime.

Crime analysts assume that crimes are not completely random, isolated and unconnected incidents; they have very common features (Ekblom, 1988:4). The causes of the problem can be uncovered by examining patterns and trends. Analysis is the key to identify these patterns and for creating efficient solutions (Bynum, 2001:2).

Probably the best-known process for crime analysis is the SARA model (Bynum, 2001:4 and Leigh et al., 1996), which emphasizes four phases of the problem-solving process; scanning, analysis, response, and assessment.

- 1.Scanning** includes the identification and spotting of the problem,
- 2.Analysis** is a through exploration of the problem and its underlying causes by using both intuition and information technology,
- 3.Response** includes devising a strategy to solve the problem, focusing on the factors recognized in the analysis phase,
- 4.Assessment** consists of review and monitoring of the progress of the solution in achieving its objectives.

4.5 Types of Crime Analysis

There are five stages of for all types of crime analysis; planning, data collection, data collation and process, analysis, and dissemination (Swanson et al., 1999:162). Not all law enforcement analysts do the same type of work. There are several different types of policing analysis. Crime analysts spend varying percentages of their time on the following three types of analysis. Each contains characteristics of crime analysis in general, but each is specific in the type of data and analysis used as well as in its purpose (Osborne and Wernicke, 2003:5).

4.5.1. Administrative/Academic Crime Analysis

The study of crime and law enforcement information focusing on socio-demographic and spatial conditions to assist in problem solving, as well as to research and evaluate responses and procedures. It includes interpreting crime statistics categorized by factors such as geographical locations and economical conditions.

4.5.2 Tactical Crime Analysis

This is immediate crime analysis, looking for series, patterns, spree, hot spots, and hot dots. Tactical crime analysis also focuses on specific information about each crime such as method of entry, point of entry, suspects actions, type of victim, type of weapon used, as well as the date, time, location, and type of location. It assists in allocation of patrol forces.

4.5.3 Strategic Crime Analysis

Analysis deals with more long-term issues and goals, the establishment of enforcement priorities and policies based on insights into the nature of a type of crime or criminal, the scope and projections of growth in types of criminal activities.



CHAPTER V

EMPIRICAL STUDY

It is unrealistic to cease crimes totally. The rule, “ If you cannot control it, then forecast it to take measures ”, is considered to be a useful policy. Forecasting is a prediction of what will occur in the future. Because of the uncertainty, the accuracy of a forecast is very important.

Economic models are constructed by the help of econometric analysis methods. The steps of a sample econometric analysis are demonstrated in figure 5.1 (Maddala,1988:5). The econometric analysis method used in the thesis is multiple regression. Regression analyses have been considered as very useful tools to clarify the causation of criminality by a number of scientists (Land et al., 1990; Kposowa and Breault, 1993; DeFronzo and Hannon, 1998).

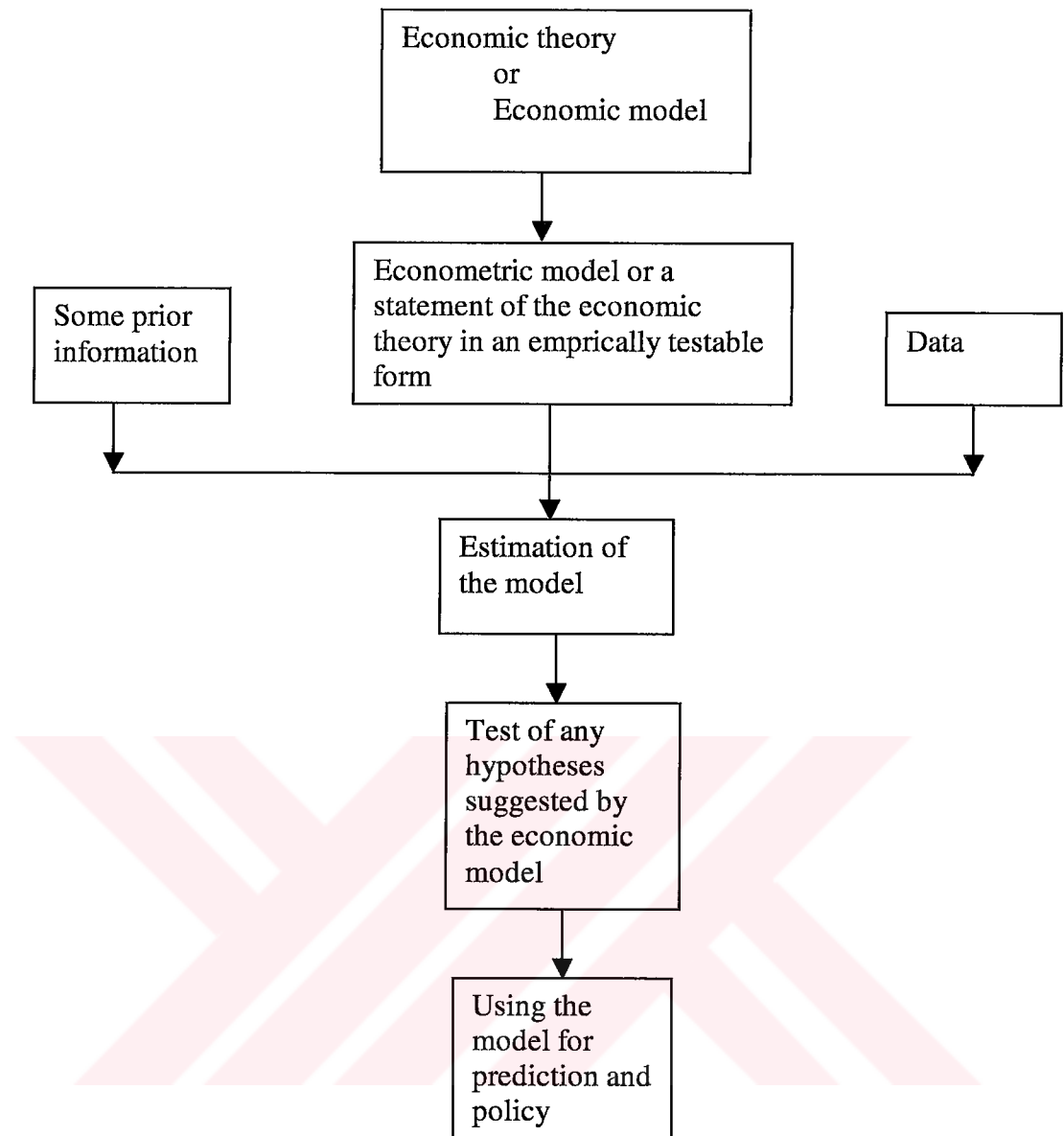


Figure 5.1 An Econometric Analysis of Economic models

There are two types of data, aggregate and individual crime data. Aggregate data include all crimes regardless of its type. Individual crime data are the crime statistics for each type of crime. Entorf and Spengler (2002) concluded that aggregate crime rates are meaningless, because they give a murder the same weight as the theft of a bicycle and for that reason property crimes dominates the overall crime rates. On the other hand aggregate data are important to understand the perception of crimes by

citizens. Aggregate data were separated into two meaningful data sets as crimes against individuals and property crimes. Especially murder and theft data are considered as the most reliable crime data due to relatively less occurrence of underreporting and under-recording in these types of crimes (Gove et al., 1985; O'Brien, 1996). That's why individual data for these two types of crimes are included in the study. There are many types of theft such as theft from houses, theft from workplaces, auto theft, theft of farm animals etc. only the sum of thefts from houses and workplaces were used in the multiple regression models.

On the way to construct models of crime rates in Turkey, the four theories (rational choice, routine activities, social disorganization and strain theories) are taken as the theoretical base of the study.

The economic variables represent the opportunity cost side of the theoretical model. The deterrence variable stands for the cost side of the theoretical equation. The demographic variables are important in explaining crimes varying in different areas.

A. Economic Variables: Education level can have impacts on the individuals' decisions to commit a crime in several ways. The measurement used for education is the percent of the population that graduated from high schools and universities. Higher educated individuals may expect higher legal earnings, thus a higher opportunity cost of committing a crime. Education may also influence people on the way to be good citizens. On the other hand, education may reduce the costs of committing crimes. Higher educated, who could be more productive, can use their

intellectual and cognitive skills in criminal activities. Therefore the effect of education on the individuals’ decision to commit a crime is vague. However, it is admitted by most researches that students who go to schools will find limited time available for participating in crimes.

The unemployment rate is an indicator of available income opportunities in the legal markets. The economic activities in a society generate good opportunities for employment. Therefore, decreases in unemployment rate reduce the incentive for an individual to commit a crime. But since the conditions also improve the wealth of other citizens, the expected gain from crime also rises.

Table 4. Gdp and Crime Rates of Selected Countries

Country/Year	Total Recorded Crime (Per 100,000)			GDP per capita (ppp ²) (\$)		
	1995	1996	1997	1995	1996	1997
Sweden	12.976	13.291	13.516	18.750	19.287	20.344
New Zealand	12.947	12.859	12.591	16.963	17.473	17.858
Denmark	10.309	10.043	10.051	21.491	22.678	23.251
USA	9.921	9.764	9.622	26.711	27.821	29.180
Canada	9.243	9.159	8.705	20.992	21.529	22.484
Germany	8.168	8.116	8.025	20.510	21.570	22.462
Finland	7.472	7.352	7.273	17.921	18.642	19.829
Norway	6.557	6.671	6.995	22.743	24.528	25.885
Italy	3.964	4.223	4.243	19.460	20.233	20.093
Netherlands	7.910	7.626	7.800	19.874	20.467	21.448
Belgium	7.081	7.299	8.035	21.105	21.986	22.921
Greece	3.147	3.336	3.591	12.174	13.083	13.856
Turkey	404	501	520	5.682	6.114	6.521

Source: Interpol’s official web address. (www.interpol.int)

² ppp denotes Purchasing Power Parity, GDP means gross domestic product.

GDP is one of the indicators of social welfare. In rich countries the payoff of crimes will be higher, this is a motivation for possible offenders. On the other hand person who has an adequate income level, will stay away from crimes. Table 4 provides the income level of citizens and crime rates for successive three years.

There is a strong positive correlation between income levels and crime rates as it is observed in the equations. Fajnzylber (1998) had found a similar result in a cross-national study. A simple linear regression model can be formulated for the data in table 4. β_1 denotes coefficient of intercept and β_2 denotes coefficient of GDP. The basic model looks like this: $CRIME_{year} = \beta_1 + \beta_2 GDP$

SPSS results are:

$CRIME_{1995} = -331,3 + 0,427 GDP$ (*P-value associated with the estimate of β_2 :0. 03*)

$CRIME_{1996} = 170,7 + 0,383 GDP$ (*P-value associated with the estimate of β_2 :0. 04*)

$CRIME_{1997} = 180,6 + 0,370 GDP$ (*P-value associated with the estimate of β_2 :0. 04*)

The effect of income inequality in a society has a negative impact. An increase in inequality may increase crime rates, because such an increase implies a larger gap between the poor` wages and those of the rich, thus reflecting a larger difference between the income from criminal and legal activities. Therefore, a rise in inequality will have a positive impact on some individual`s propensity to commit crime.

B. Deterrence Variables: It is considered that the police rate, which is measured as the number of law enforcement officers per 100,000 residents, increases the probability to catch criminals and have a negative impact on crime rate. This is

one of the deterrence effects. On the other hand it is an endogenous variable. The workforce of law enforcement officers is determined before the crimes occur, generally according to the past data. For that reason positive correlation is common in the literature.

The past incidence of crime and clear-up rates in society might determine offenders' perceived probability of arrest. Clear-up means that the criminal's identity has been determined by the law enforcement agencies. If the criminal is unidentified, the law enforcement agencies keep on investigating for 10 years in theft and 20 years in murder. Clear-up rates vary according to the type of crime. In crimes against persons, they are generally higher than property crimes. Since in crimes against persons, offenders generally interact with victims in most cases and can easily be identified.

C. Demographic Variables: The percentage of the young population, which is the ages between 15 and 25, is considered a positive impact on crimes. Most crimes are committed by young people, especially by men. The age and sex variable is expected to have a direct relationship with the crime rate. Most crimes are committed in highly urbanized areas. Population density and municipality size are also considered to have a positive impact on crime rates.

Turkish law enforcement agencies adapted their criminal code index to the Western Countries' system in 2001. Currently they examine public order crimes mainly in two sub-headings; crimes against persons and crimes against property. Personal crimes are assumed to be the by-products of economic incentives, but expected to be less relevant to the economic conditions. They include rape, murder,

battery etc. In multiple regressions murder rate is used. Since murder rate is assumed to be the most accurate crime data all around the world. Secondly theft rate is used. Theft rate generally dominates the category of property crimes. Lastly total crime rate is used and it is important to give an idea how citizens perceive crime as a part of daily life. In literature some of the researches used only murder rates, some of them preferred property crime rates. There are also researches who used total crime rates in their studies. In this study total crime rates, property crimes, and crimes against persons are used. In addition we analyze murder and theft separately.

There are four main parts of the empirical study. First of all, the analyses are performed for police area within all 81 cities for years 2000 and 2001 separately. In these studies only police workforce and crime records in the police are used. Then the same analyses are performed for cities area including both police and gendarmerie statistics, which are crimes, occurred in gendarmerie area and investigated by Gendarmerie workforce. The number of crime in gendarme area increased in a considerable amount in 2001 due a change in the recording system. In regressions the crime data for 2000 and 2001 are used separately. Police and Gendarmerie have the same duties and responsibilities in different areas. Information about the responsibility areas of two governmental law enforcement agencies is summarized in Appendix B. In multiple regression analyses the dependent variable for all models is crime rate (CRIME). The explanatory variables are economic, demographic and deterrence variables. Definitions of variables and sources of data are presented in Appendix C. Correlations between variables are shown in Appendix D-G. Names of variables are written as abbreviations in correlation matrices. The long forms of abbreviations are presented in Appendix H. The data on

socioeconomic variables are most current data available, collected in the census 2000 in Turkey. The raw data for all variables, including crimes, are presented in the Appendix I-AA.

The dependent variables, crime rates, are regressed against all explanatory variables for all cities by the help of SPSS statistics program. Regression models using crime rates as the dependent variable look like this:

$$\begin{aligned} \text{CRIME} = & \beta_1 + \beta_2 \text{ Education} + \beta_3 \text{ Enrollment Rate} + \beta_4 \text{ Gdp} + \beta_5 \\ & \text{Unemployment Rate} + \beta_6 \text{ Workforce} + \beta_7 \text{ Clear-Up Rates} + \beta_8 \text{ Young} \\ & \text{population} + \beta_9 \text{ Population Density} + \beta_{10} \text{ Size of City} + \beta_{11} \\ & \text{Urbanization} + \epsilon \end{aligned}$$

Descriptive statistics containing the sample observations of police area for years 2000 and 2001 are summarized in table 5 and 6 respectively. Regression results of the analysis are presented in table 7 and 8 in the same order. Note that some explanatory variables are observed every 5 years, the time between two successive censuses. Same values for these variables are used in the regressions of 2000 and 2001.

Table 5. Descriptive Statistics for Police Area in 2000

	Min.	Max.	Mean	Std. Deviation
EDUCATION LEVEL	6,97	28,66	14,23	4,1
ENROLLMENT RATE	4,54	44,07	15,9	6,19
INCOME LEVEL	725,29	7556,28	2373,37	1196,84
UNEMPLOYMENT	2,22	13,99	5,87	2,67
POLICE WORKFORCE	174,7	1923,78	396,46	237,03
THEFT CLEAR-UP	16,74	93,56	59,72	18,91
MURDER CLEAR-UP	0	100	86,85	24,3
PROPERTY CRIMES CLEAR-UP	33,24	95,88	73,86	13,55
CRIMES AGAINST PERSONS CLEAR-UP	85,86	100	98,41	1,75
TOTAL CRIMES CLEAR-UP	49,75	98,39	87,76	8,8
YOUNGMAN	7,57	22,68	10,73	1,93
POPDENSITY	13	1928	104,79	213,75
CITYSIZE	0	1	0,2	0,4
URBANIZATION	26,06	90,69	55,47	11,92
NUMBER OF THEFTS	34,25	609,15	119,52	92,1
NUMBER OF MURDERS	0	141,5	31,47	21,78
NUMBER OF PROPERTY CRIMES	61,29	780,92	220,94	121,19
NUMBER OF CRIMES AGAINSTPERSONS	102,94	768,33	309,15	138,04
TOTAL CRIME	164,23	1190,69	530,09	218,71

Table 6. Descriptive Statistics for Police Area in 2001

	Min.	Max.	Mean	Std. Deviation
INCOME LEVEL	568	6155	1769,6	912,09
POLICE WORKFORCE	213,6	6145,96	521,89	680,83
THEFT CLEAR-UP	17,19	95,51	59,98	19,21
MURDER CLEAR-UP	0	100	87,06	21,19
PROPERTY CRIMES CLEAR-UP	23,83	96,43	67,32	15,6
CRIMES AGAINST PERSONS CLEAR-UP	86,07	100	98,3	1,85
TOTAL CRIMES CLEAR-UP	47,4	98,16	85,75	10,28
NUMBER OF THEFTS	42,74	740,56	150,29	114,85
NUMBER OF MURDERS	0	79,79	31,52	14,98
NUMBER OF PROPERTY CRIMES	63,07	893,23	224,76	147,92
NUMBER OF CRIMES AGAINSTPERSONS	111,5	898,99	354,12	160,55
TOTAL CRIME	205,29	1356,19	575,13	261,84

Table 7. Regression Results for Police Area in 2000

<i>Variables</i>	<i>Theft</i>	<i>Murder</i>	<i>Crimes Against Persons</i>	<i>Property Crimes</i>	<i>Total</i>
Constant					
Coefficient estimate	285,572	95,317	-925,136	717,503	1685,988
standard error	68,258	27,047	1611,274	96,477	302,016
p-value	0,000	0,017	0,000	0,000	0,000
Education					
Coefficient estimate	6,334	-1,915	6,978	7,441	14,958
standard error	3,495	0,883	5,956	4,043	8,487
p-value	0,074	0,034	0,245	0,070	0,082
Enrollment Rate					
Coefficient estimate	-2,951	-0,105	1,502	-1,322	1,044
standard error	2,521	0,638	4,287	2,913	6,140
p-value	0,246	0,869	0,727	0,651	0,865
Income Level					
Coefficient estimate	0,020	0,003	0,001	0,022	0,019
standard error	0,011	0,003	0,019	0,013	0,028
p-value	0,079	0,362	0,970	0,091	0,486
Unemployment					
Coefficient estimate	1,961	-0,748	-1,471	0,175	-1,107
standard error	4,810	1,225	8,185	5,545	11,669
p-value	0,685	0,544	0,858	0,975	0,925
Police Workforce					
Coefficient estimate	0,080	0,015	0,292	0,117	0,425
standard error	0,048	0,014	0,081	0,055	0,116
p-value	0,096	0,271	0,001	0,037	0,000
Clear up					
Coefficient estimate	-1,753	-0,522	14,221	-4,275	-9,158
standard error	0,453	0,234	16,168	0,781	2,864
p-value	0,000	0,029	0,382	0,000	0,002
Young man					
Coefficient estimate	-17,727	-1,055	-24,075	-23,863	-44,878
standard error	6,264	1,663	10,659	7,231	15,271
p-value	0,006	0,528	0,027	0,002	0,004
Population Density					
Coefficient estimate	0,027	0,043	0,053	0,071	-0,057
standard error	0,044	0,011	0,125	0,051	0,114
p-value	0,545	0,000	0,674	0,166	0,620
City Size					
Coefficient estimate	50,467	0,015	71,285	52,829	110,094
standard error	26,842	6,743	45,455	31,182	65,821
p-value	0,064	0,998	0,121	0,095	0,099
Urbanization					
Coefficient estimate	-0,345	0,261	-2,855	-2,310	-5,839
standard error	1,218	0,320	2,121	1,409	2,970
p-value	0,778	0,418	0,183	0,106	0,053
R Square	0,469	0,369	0,317	0,592	0,445
Adjusted R Square	0,393	0,272	0,220	0,534	0,366

Table 8. Regression Results for Police Area in 2001

<i>Variables</i>	<i>Theft</i>	<i>Murder</i>	<i>Crimes Against Persons</i>	<i>Property Crimes</i>	<i>Total</i>
Constant					
coefficient estimate	338,459	22,730	1536,080	580,102	1560,662
standard error	84,308	12,580	1631,096	118,473	367,751
p-value	0,000	0,075	0,350	0,000	0,000
Education					
coefficient estimate	9,059	-0,302	6,880	10,553	12,307
standard error	4,178	0,675	7,271	5,177	11,058
p-value	0,034	0,656	0,347	0,045	0,270
Enrollment Rate					
coefficient estimate	-4,279	-0,418	3,409	-3,639	4,256
standard error	3,208	0,483	5,564	3,972	8,489
p-value	0,186	0,391	0,542	0,363	0,618
Income Level					
coefficient estimate	0,032	0,004	-0,006	0,031	-0,002
standard error	0,016	0,003	0,028	0,020	0,042
p-value	0,051	0,114	0,830	0,117	0,964
Unemployment					
coefficient estimate	-0,867	-0,620	-11,007	-6,387	-16,693
standard error	5,881	0,950	10,464	7,291	15,486
p-value	0,883	0,516	0,296	0,384	0,285
Police Workforce					
coefficient estimate	0,001	0,001	0,026	0,005	0,031
standard error	0,015	0,002	0,026	0,019	0,040
p-value	0,942	0,687	0,320	0,782	0,431
Clear up					
coefficient estimate	-2,268	0,219	-9,922	-3,748	-7,741
standard error	0,545	0,077	16,062	0,858	3,147
p-value	0,000	0,006	0,539	0,000	0,016
Young man					
coefficient estimate	-11,187	-1,876	4,122	-11,250	-1,770
standard error	5,896	0,956	10,209	7,288	15,446
p-value	0,062	0,054	0,688	0,127	0,909
Population Density					
coefficient estimate	0,076	-0,001	-0,055	0,168	0,102
standard error	0,052	0,008	0,133	0,064	0,144
p-value	0,152	0,901	0,680	0,011	0,480
City Size					
coefficient estimate	62,716	2,949	95,076	67,641	186,940
standard error	32,319	5,187	54,996	40,154	84,668
p-value	0,056	0,571	0,088	0,097	0,031
Urbanization					
coefficient estimate	-1,222	0,287	-6,348	-2,317	-9,108
standard error	1,447	0,231	2,506	1,794	3,826
p-value	0,401	0,219	0,014	0,201	0,020
R Square	0,510	0,237	0,252	0,547	0,348
Adjusted R Square	0,440	0,128	0,145	0,483	0,255

Unfortunately there are a few variables statistically significant with crime rates. Its reason can be the high correlations between variables. Not surprisingly property crimes are influenced by the economic conditions more than murder and crimes against persons. Unemployment level seems insignificant with all types of crimes; conversely clear-up rates seem significant for most crimes. A decrease in the number of variables can create models with better results. SPSS program offers five types of variable selection approach. One of them is stepwise regression, which is a technique for choosing the variables to include in a multiple regression model. A new regression is ran for each new variable that is considered to be included in the model in order to see if the variable is beneficial to the model and how beneficial it is. At each step Stepwise regression adds the most statistically significant variable (the one with the highest F statistic or lowest p-value) until there are none left. The threshold significance level of 5 % for adding a variable was used. The results of stepwise regression, the best models for each type of crimes, are presented in the following tables.

Table 9. Dependent Variable: Theft (Police Area in 2000)

R square = 0,389
Adjusted R square = 0,365

Stepwise Regression Results for Theft

Variable	Coefficient	P-value
(Constant)	169,241	0,000
CITY SIZE	65,288	0,005
CLEAR-UP	-1,846	0,000
INCOME LEVEL	0,020	0,008

Table 10. Dependent Variable: Murder (Police Area in 2000)

R square = 0,337
Adjusted R square = 0,309

Stepwise Regression Results for Murder

Variable	Coefficient	P-value
(Constant)	99,726	0,000
POPULATION DENSITY	0,045	0,000
CLEAR-UP	-0,581	0,009
EDUCATION	-1,214	0,020

Table 11. Dependent Variable: Crimes Against Persons (Police Area in 2000)

R square = 0,317
Adjusted R square = 0,220

Stepwise Regression Results for Crimes Against Persons

Variable	Coefficient	P-value
(Constant)	408,612	0,000
POLICE	0,357	0,000
YOUNGMAN	-33,717	0,000
EDUCATION	8,494	0,016

Table 12. Dependent Variable: Crimes Against Property (Police Area in 2000)

R square = 0,530
Adjusted R square = 0,505

Stepwise Regression Results for Crimes Against Property

Variable	Coefficient	P-value
(Constant)	705,033	0,000
POLICE	0,136	0,012
CLEAR-UP	-4,890	0,000
INCOME LEVEL	0,036	0,000
YOUNGMAN	-24,408	0,000

Table 13. Dependent Variable: Total Crimes (Police Area in 2000)

R square = 0,411
Adjusted R square = 0,372

Stepwise Regression Results for Total Crimes

Variable	Coefficient	P-value
(Constant)	1703,058	0,000
CLEAR-UP	-9,553	0,000
POLICE	0,433	0,000
YOUNGMAN	-53,010	0,000
EDUCATION	21,284	0,000
URBANIZATION	-4,330	0,042

Table 14. Dependent Variable: Theft (Police Area in 2001)

R square = 0,433
Adjusted R square = 0,411

Stepwise Regression Results for Theft

Variable	Coefficient	P-value
(Constant)	205,920	0,000
INCOME LEVEL	0,039	0,001
CLEAR-UP	-2,331	0,000
CITY SIZE	74,994	0,007

Table 15. Dependent Variable: Murder (Police Area in 2001)

R square = 0,193
Adjusted R square = 0,161

Stepwise Regression Results for Murder

Variable	Coefficient	P-value
(Constant)	22,303	0,059
CLEAR-UP	0,193	0,010
YOUNGMAN	-2,165	0,009
URBANIZATION	0,282	0,035

Table 16. Dependent Variable: Crimes Against Persons (Police Area in 2001)

R square = 0,146
Adjusted R square = 0,136

Stepwise Regression Results for Crimes Against Persons

Variable	Coefficient	P-value
(Constant)	489,405	0,000
UNEMPLOYMENT	-23,040	0,000

Table 17. Dependent Variable: Crimes Against Property (Police Area in 2001)

R square = 0,508
Adjusted R square = 0,475

Stepwise Regression Results for Crimes Against Property

Variable	Coefficient	P-value
(Constant)	468,404	0,000
CLEAR-UP	-3,695	0,000
INCOME LEVEL	0,030	0,063
POPULATION DENSITY	0,174	0,007
UNEMPLOYMENT	-13,573	0,009
CITY SIZE	71,801	0,046

Table 18. Dependent Variable: Total Crimes (Police Area in 2001)

R square = 0,251
Adjusted R square = 0,232

Stepwise Regression Results for Total Crimes

Variable	Coefficient	P-value
(Constant)	1669,159	0,000
CLEAR-UP	-10,154	0,000
UNEMPLOYMENT	-38,043	0,000

For both years 2000 and 2001, size of the city, average income and the clear-up rate are statistically significant with theft rates. Clear-up rate has a negative relationship with theft rates. On the other hand theft rates have positive relationship with the size of the city and the average income of the inhabitants.

Population density, clear-up rate and education level are significant with the murder rates in the analysis of 2000. They have all the expected signs. Murder is increasing in denser areas and decreasing in cities where education level is higher. Clear-up rate again has negative sign with murder in 2001. Young men population also has a negative relationship with murder rates and conversely urbanization level seems to have a positive relationship with murder rates in 2001.

Crimes against persons have the smallest adjusted R square values, which are 0,220 and 0,161 among all types of crimes. They have no relationship with the economic variables. In 2000 police workforce and education level are positively correlated with crimes against persons. In 2001 crimes against persons have negative relationship with young man population.

In 2000 and 2001 property crimes have the highest adjusted R square values, which are 0,505 and 0,475. For both years they have more significant variables than other crimes. Clear-up rate and average income are common significant variables. As it is observed in theft, clear-up rate has negative, whereas average income has positive signs with property crimes. Population density and size of the city have positively correlated in 2001, police workforce has a positive correlation with property crimes in 2000. Surprisingly young man population and unemployment level both seem to have a negative correlation with property crimes in 2000 and 2001.

Total crimes have very different results with different adjusted R squares in 2000 and 2001. Clear-up rate is common variable which negatively significant for both years. Young man population and urbanization level have negative signs in 2001, unemployment rate is also statistically significant with total crime rate in negative direction. Education and police workforce are correlated with total crime rate in year 2000.

Descriptions of variables for cities including gendarmerie data for years 2000 and 2001 are summarized in table 19 and 20 respectively. Regression results are presented in table 21 and 22.

Table 19. Descriptive Statistics for Cities including Gendarmerie Area in 2000

	Min.	Max.	Mean	Std. Deviation
EDUCATION LEVEL	6,97	28,66	14,23	4,1
ENROLLMENT RATE	4,54	44,07	15,9	6,19
INCOME LEVEL	725,29	7556,28	2373,37	1196,84
UNEMPLOYMENT	2,22	13,99	5,87	2,67
LAW ENFORCEMENT WORKFORCE	111,27	2054,84	287,83	227,23
THEFT CLEAR-UP	17,1	93,49	61,34	17,71
MURDER CLEAR-UP	70	100	92,28	8,26
PROPERTY CRIMES CLEAR-UP	34,28	94,44	74,04	12,95
CRIMES AGAINST PERSONS CLEAR-UP	86,09	100	98,43	1,72
TOTAL CRIMES CLEAR-UP	50,13	98,12	88,42	8,43
YOUNGMAN	7,57	22,68	10,73	1,93
POPDENSITY	13	1928	104,79	213,75
CITYSIZE	0	1	0,2	0,4
URBANIZATION	26,06	90,69	55,47	11,92
NUMBER OF THEFTS	20,86	354,83	74,4	64,96
NUMBER OF MURDERS	11,83	165,61	35,93	20,92
NUMBER OF PROPERTY CRIMES	47,5	497,45	135,4	86,44
NUMBER OF CRIMES AGAINSTPERSONS	95,63	388,96	200,02	72,42
TOTAL CRIME	143,13	765	335,41	136,94

Table 20. Descriptive Statistics for Cities including Gendarmerie Area in 2001

	Min.	Max.	Mean	Std. Deviation
INCOME LEVEL	568	6155	1769,6	912,09
LAW ENFORCEMENT WORKFORCE	91,46	2101,86	314,64	231,66
THEFT CLEAR-UP	17,46	95,54	60,79	18,65
MURDER CLEAR-UP	0	100	89,26	13,68
PROPERTY CRIMES CLEAR-UP	24,77	96,28	69,18	14,78
CRIMES AGAINST PERSONS CLEAR-UP	86,21	100	98,29	1,79
TOTAL CRIMES CLEAR-UP	86,21	100	98,29	1,79
NUMBER OF THEFTS	21,57	443,39	89,46	81,45
NUMBER OF MURDERS	0	66,36	35,14	13,11
NUMBER OF PROPERTY CRIMES	47,17	665,68	141,09	107,25
NUMBER OF CRIMES AGAINST PERSONS	54,23	462,69	205,48	78,86
TOTAL CRIME	101,4	896,5	346,57	163,27

Table 21. Regression Results for Cities including Gendarme Area in 2000

<i>Variables</i>	<i>Theft</i>	<i>Murder</i>	<i>Crimes Against Persons</i>	<i>Property Crimes</i>	<i>Total</i>
Constant					
coefficient estimate	143,053	136,146	-630,161	368,023	1007,456
standard error	46,271	30,767	866,416	61,056	182,932
p-value	0,003	0,000	0,469	0,000	0,000
Education					
coefficient estimate	2,823	-1,882	4,383	3,194	7,643
standard error	2,087	0,849	3,085	2,328	4,608
p-value	0,181	0,030	0,160	0,174	0,102
Enrollment Rate					
coefficient estimate	-0,929	-0,205	1,944	-0,241	2,509
standard error	1,492	0,613	2,203	1,657	3,299
p-value	0,535	0,739	0,381	0,885	0,449
Income Level					
coefficient estimate	0,008	0,001	-0,009	0,008	-0,004
standard error	0,007	0,003	0,010	0,007	0,015
p-value	0,237	0,752	0,389	0,282	0,789
Unemployment					
coefficient estimate	0,309	-2,634	-1,432	-1,326	-2,811
standard error	2,867	1,180	4,234	3,183	6,319
p-value	0,914	0,029	0,736	0,678	0,658
Law Enforcement Workforce					
coefficient estimate	0,042	0,018	0,172	0,067	0,244
standard error	0,032	0,013	0,048	0,036	0,071
p-value	0,197	0,186	0,001	0,065	0,001
Clear up					
coefficient estimate	-1,287	-0,779	8,637	-2,923	-7,021
standard error	0,292	0,257	8,691	0,473	1,688
p-value	0,000	0,003	0,324	0,000	0,000
Young man					
coefficient estimate	-10,442	-2,258	-15,045	-13,898	-26,400
standard error	4,158	1,704	6,134	4,624	9,217
p-value	0,014	0,190	0,017	0,004	0,006
Population Density					
coefficient estimate	0,051	0,035	0,014	0,095	-0,017
standard error	0,026	0,011	0,066	0,029	0,062
p-value	0,057	0,002	0,833	0,002	0,782
City Size					
coefficient estimate	35,576	-2,786	53,489	36,818	75,687
standard error	15,844	6,433	23,518	17,735	35,388
p-value	0,028	0,666	0,026	0,042	0,036
Urbanization					
coefficient estimate	0,929	0,561	0,277	0,780	0,467
standard error	0,698	0,292	1,049	0,777	1,550
p-value	0,188	0,058	0,793	0,319	0,764
R Square	0,625	0,393	0,345	0,739	0,590
Adjusted R Square	0,572	0,306	0,251	0,702	0,532

<i>Variables</i>	<i>Theft</i>	<i>Murder</i>	<i>Crimes Against Persons</i>	<i>Property Crimes</i>	<i>Total</i>
Constant					
coefficient estimate	160,682	23,796	24,610	300,588	2159,833
standard error	52,725	15,182	823,540	69,836	1389,355
p-value	0,003	0,122	0,976	0,000	0,125
Education					
coefficient estimate	4,907	-0,719	4,304	6,659	12,985
standard error	2,400	0,644	3,359	2,822	5,667
p-value	0,045	0,268	0,204	0,021	0,025
Enrollment Rate					
coefficient estimate	-2,371	0,131	1,440	-2,014	-1,694
standard error	1,830	0,488	2,551	2,154	4,303
p-value	0,199	0,789	0,574	0,353	0,695
Income Level					
coefficient estimate	0,014	0,002	0,000	0,011	0,010
standard error	0,009	0,002	0,013	0,011	0,021
p-value	0,134	0,398	0,974	0,302	0,651
Unemployment					
coefficient estimate	-1,369	-0,315	-3,591	-5,295	-11,023
standard error	3,341	0,891	4,881	3,933	8,235
p-value	0,683	0,725	0,464	0,183	0,185
Law Enforcement Workforce					
coefficient estimate	0,064	-0,006	0,166	0,107	0,252
standard error	0,036	0,010	0,052	0,042	0,088
p-value	0,080	0,571	0,002	0,014	0,006
Clear up					
coefficient estimate	-1,457	0,221	1,613	-2,635	-19,008
standard error	0,320	0,109	8,211	0,498	13,852
p-value	0,000	0,047	0,845	0,000	0,174
Young man					
coefficient estimate	-12,546	-0,410	-10,357	-14,831	-23,794
standard error	4,749	1,271	6,637	5,579	11,197
p-value	0,010	0,748	0,123	0,010	0,037
Population Density					
coefficient estimate	0,100	0,003	-0,013	0,173	0,063
standard error	0,030	0,008	0,065	0,035	0,109
p-value	0,001	0,661	0,837	0,000	0,563
City Size					
coefficient estimate	40,820	5,125	55,409	37,104	110,817
standard error	18,311	4,814	25,175	21,638	42,472
p-value	0,029	0,291	0,031	0,091	0,011
Urbanization					
coefficient estimate	1,139	0,051	0,185	1,267	1,644
standard error	0,819	0,219	1,140	0,963	1,924
p-value	0,168	0,818	0,871	0,193	0,396
R Square	0,686	0,138	0,351	0,750	0,57
Adjusted R Square	0,642	0,015	0,259	0,715	0,51

Table 23. Dependent Variable: Theft (including Gendarmerie Area in 2000)

R square = 0,573
Adjusted R square = 0,551

Stepwise Regression Results for Theft

Variable	Coefficient	P-value
(Constant)	111,552	0,000
CITY SIZE	55,072	0,000
CLEAR-UP	-1,341	0,000
INCOME LEVEL	0,012	0,013
POPULATION DENSITY	0,064	0,014

Table 24. Dependent Variable: Murder (including Gendarmerie Area in 2000)

R square = 0,267
Adjusted R square = 0,248

Stepwise Regression Results for Murder

Variable	Coefficient	P-value
(Constant)	109,041	0,000
CLEAR-UP	-0,827	0,002
POPULATION DENSITY	0,031	0,003

Table 25. Dependent Variable: Crimes Against Persons (including Gendarmerie Area in 2000)

R square = 0,274
Adjusted R square = 0,245

Stepwise Regression Results for Crimes Against Persons

Variable	Coefficient	P-value
(Constant)	239,914	0,000
EDUCATION	7,145	0,000
LAW ENFORCEMENT	0,182	0,000
YOUNGMAN	-18,082	0,002

Table 26. Dependent Variable: Crimes Against Property (including Gendarmerie Area in 2000)

R square = 0,708
Adjusted R square = 0,688

Stepwise Regression Results for Crimes Against Property

Variable	Coefficient	P-value
(Constant)	372,828	0,000
CLEAR-UP	-3,149	0,000
INCOME LEVEL	0,016	0,002
POPULATION DENSITY	0,099	0,001
CITY SIZE	46,615	0,004
YOUNGMAN	-5,733	0,047

Table 27. Dependent Variable: Total Crimes (including Gendarmerie Area in 2000)

R square = 0,494
Adjusted R square = 0,474

Stepwise Regression Results for Total Crimes

Variable	Coefficient	P-value
(Constant)	763,848	0,000
CLEAR-UP	-6,554	0,000
EDUCATION	9,599	0,002
CITY SIZE	73,078	0,029

Table 28. Dependent Variable: Theft (including Gendarmerie Area in 2001)

R square = 0,635
Adjusted R square = 0,616

Stepwise Regression Results for Theft

Variable	Coefficient	P-value
(Constant)	85,747	0,005
CITY SIZE	63,699	0,000
POPULATION DENSITY	0,122	0,000
CLEAR-UP	-1,377	0,000
EDUCATION	4,360	0,005

Table 29. Dependent Variable: Crimes Against Persons (including Gendarmerie Area in 2001)

R square = 0,327
Adjusted R square = 0,292

Stepwise Regression Results for Crimes Against Persons

Variable	Coefficient	P-value
(Constant)	192,618	0,001
EDUCATION	6,975	0,001
LAW ENFORCEMENT	0,178	0,000
YOUNGMAN	-14,028	0,019
CITY SIZE	41,461	0,043

Table 30. Dependent Variable: Crimes Against Property (including Gendarmerie Area in 2001)

R square = 0,701
Adjusted R square = 0,686

Stepwise Regression Results for Crimes Against Property

Variable	Coefficient	P-value
(Constant)	184,422	0,000
POPULATION DENSITY	0,185	0,000
CLEAR-UP	-2,574	0,000
EDUCATION	7,402	0,000
CITY SIZE	50,820	0,011

Table 31. Dependent Variable: Total Crimes (including Gendarmerie Area in 2001)

R square = 0,512
Adjusted R square = 0,486

Stepwise Regression Results for Total Crimes

Variable	Coefficient	P-value
(Constant)	3319,262	0,000
EDUCATION	13,337	0,001
CLEAR-UP	-31,723	0,000
CITY SIZE	126,274	0,001
UNEMPLOYMENT	-11,796	0,045

In several regression models higher adjusted R square values were observed when the gendarmerie statistics were added to police statistics. The adjusted R square of theft increased from 0,365 to 0,551 in 2000 and 0,411 to 0,616 in 2001. The former three significant variables, which are average income, city size and clear-up

rates, remained as significant with the expected and previous signs. Population density was added to the new model with a positive sign. According to the regression of 2001 in cities, education level seems significant in positive direction with theft rates.

Murder and crime against persons have the smallest R square values as in the previous regression. In 2000 murder rate is negatively related to clear-up rates and increasing with the population density as in the previous study. None of the variables correlate with murder in 2001.

Crimes against persons correlate with young man population negatively; on the other hand it has a positive relationship with law enforcement workforce and education level. It is observed that population density has a positive impact on crimes against persons according to the results of regression in 2001.

Crimes against property have the highest and very close R square values, which are 0,688 and 0,686 for 2000 and 2001. Average income, population density and size of the city are positively significant in 2000; on the other hand law enforcement workforce and education level are significant with crime rates in the same direction in 2001.

Total crimes have similar results in 2000 and 2001. Three of the significant variables are exactly the same variables. They are clear-up rates, education and city size. Clear-up rate and size of the city have expected signs. Education has a positive effect on total crime rates in both years. Unemployment level has a negative significance with total crime rates in 2001.

For police area and cities including gendarmerie area, R square values of the models for crimes against property are higher than the models of other crimes.

Table 32. Total Results of 20 Regressions

	Expected Sign	Negatively Significant	Positively Significant	Total
CLEAR-UP	-	14	1	15
CITY SIZE	+	0	10	10
EDUCATION	?	1	8	9
POPULATION DENSITY	+	0	7	7
YOUNG MAN	+	7	0	7
INCOME LEVEL	+	0	6	6
LAW ENFORCEMENT	?	0	5	5
UNEMPLOYMENT	+	4	0	4
URBANIZATION	+	1	1	2
ENROLLMENT RATE	-	0	0	0

Table 32 summarizes the results of 20 regressions. Most of the variables are consistent with the literature except young men population and enrollment rate. It must be emphasized that majority of the empirical literature is from America and European countries. There are few contributions of Asian and Eastern countries to the literature. In the Western countries young people commit more crimes. “Although high school graduation rate and college enrollment increased, also the number of children with one parent increased, drug use are rising day by day ” (Michael and Pergamit, 2001). Another observer, Furnsternberg (2000) claims that “Advanced industrial societies create adolescence and early adulthood of life stages in way that inevitably make them problematic ”. In Turkey crimes are generally committed by an age group of 29 and 49 according to the reports of State Institute of

Statistics of Turkey. Table 33 (Judicial Statistics, 2000:230) shows that a large portion of the convicts received into prison for several crime categories is accounted by people in 29-49 ages group. The negative relationship between crime and young population in our regression result is, therefore, not surprising.

Table 33.Convicts Received into Prison by Type of Crime and Age Group in 2000

TYPE OF CRIME	15-29 Ages	29-49 Ages
MURDER	1488	1596
SWINDLING	1182	5028
ASSAULT AND BATTERY	1594	1813
THEFT	3102	1808
USE AND SALE OF NARCOTICS	659	1666
MISDEMEANOR	364	604

The total number of 98.969 convicts has been received into prisons in 2000. 81 convicts at 11-15 age group, 835 convicts at 16-18 age group, 3891 convicts at 19-21 age group, 22554 convicts at 22-29 age group, 35080 convicts at 30-39 age group 24203 convicts at 40-49 age group 9274 convicts at 50-59 age group 1619 convicts at 60-64 age group, 1432 convicts at 65 and over have been received into prisons. (Figure 5.2) (Judicial Statistics, 2000:188).

Reasons of this difference are in the interest of sociology and psychology. Social and cultural differences between societies maybe the reason of different findings. Since the social and family bonds are strong in Turkey, parents take care of their children even if they are 18 or older. The other reason can be level of drug use. There is a very strong and positive relation between drug use and conviction rates. In

some of the Western countries the use and sale of drugs is not prohibited. Obviously in Turkey youngsters use drugs less heavily than same age group in Western countries.

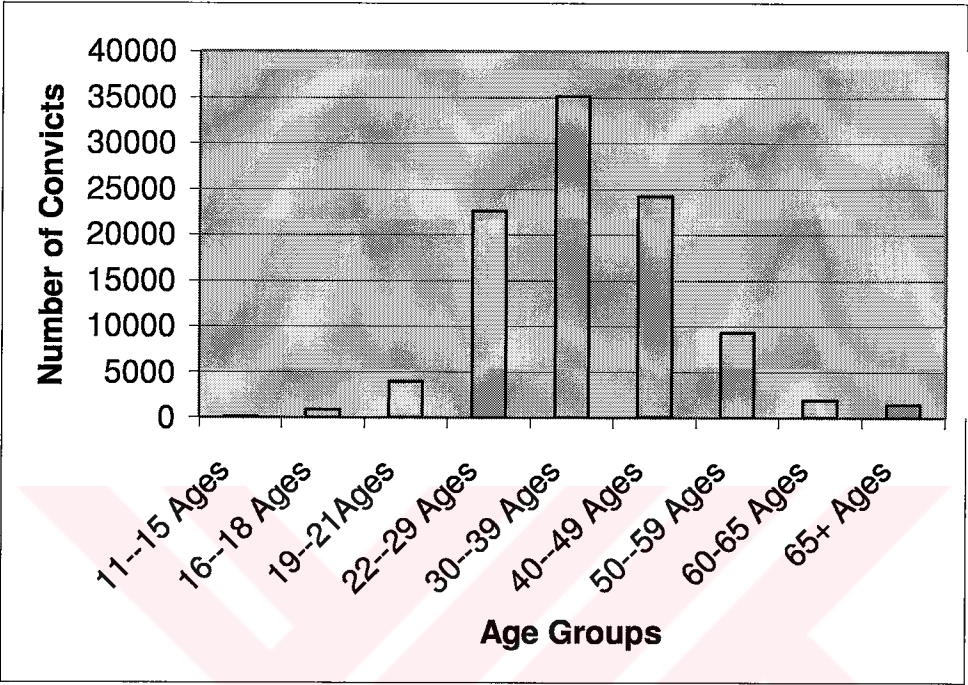


Figure 5.2 Convicts Received into Prison by Age Group in 2000

There are some limitations of the study. One of them is the official data problem. Up to now, large-scale victimization survey hasn't been done in Turkey. Victimization survey is an important source of information about rates of crime and public attitudes to crime. It is highly regarded by researchers. It measures the amount of crime by asking people about crimes they have experienced in the last year. Nevertheless, some researchers think that underreporting or under-recording crime of crime does not impose any significant bias in economic models of crime or the resultant forecasts of the crime rate (Pudney et al., 2000). Second limitation is high

degree of correlation between some variables. For that reason many of the studies, that include close and related variables, find no significance (Levitt, 1999:89). Due to unavailability of data we assume that the socioeconomic variables are the same for 2000 and 2001. But we believe that it is not a major disadvantage, since socioeconomic variables change very gradually.



CHAPTER VI

SHORT-TERM FORECASTING OF CRIME

Forecasting of crime rates in the short run maybe helpful in tactical crime fighting activities. Simple forecasting techniques may reveal the trends and seasonalities underlying the crime rates, and provide reliable future predictions. As an example, in this chapter we describe the use of a practical, short term forecasting method, trend and seasonality adjusted exponential smoothing.

A seasonal pattern is a repetitive increase and decrease in occurrences. There are many statistical techniques used when there exist seasonal effects. One of the common methods, which is used in the forecasting, is Holt-Winter's method. It is an advanced forecasting technique, most appropriate when time series display trend and seasonality at the same time. The forecasting function in the Holt-Winter's method is represented by the formulas (Ragsdale, 1995:436):

$$\hat{Y}_{t+n} = (E_t + nT_t) S_{t+n-p} \quad (2)$$

$$E_t = \alpha (Y_t / S_{t-p}) + (1 - \alpha)(E_{t-1} + T_{t-1}) \quad (3)$$

$$T_t = \beta (E_t - E_{t-1}) + (1 - \beta) T_{t-1} \quad (4)$$

$$S_t = \gamma (Y_t - E_t) + (1 - \gamma) S_{t-p} \quad (5)$$

|Where,

p = number of seasons ($p=12$ for monthly data)

α = smoothing constant (weighting factor)

β = a smoothing constant for trend

γ = a smoothing constant for seasonality

T_t = trend factor for time period t

Y_t = actual observation for time period t

$\hat{Y}_t$ = forecast for time period t

S_t = seasonal index for time period t

E_t = base level for time period t

The forecasting function in equation (2) is used to obtain forecasts k time periods into the future where $k = 1, 2, \dots, p$. The forecast for time period $t + k$ ($\hat{Y}_{t+k}$) is obtained in equation (2) by multiplying the expected base level at the time period $t+k$ (given by $E_t + kT_t$) by the most recent estimate of the seasonality associated with this time period given by (S_{t-k-p}). The smoothing parameters α , β , and γ in equations (3), (4) and (5) can assume any value between 0 and 1 ($0 \leq \alpha \leq 1$, $0 \leq \beta \leq 1$, $0 \leq \gamma \leq 1$).

The expected base level of the time series in time period t (E_t) is updated in equation (3), which takes a weighted average of the following two values:

- $E_{t-1} + T_{t-1}$, which represents the expected base level of the time series in the time period t before observing the actual value at time period t (given by Y_t)

- Y_t/S_{t-p} , which represents the de-seasonalized estimate of the base level of the time series at time period t after observing Y_t

The estimated per-period trend factor T_t is updated using equation (4), which is identical to the procedure in equation (5). The estimated seasonal adjustment factor for each time period is calculated using equation (5), which takes a weighted average of the following two quantities.

1. S_{t-p} , which represents the most recent seasonal index for the season in which time period t occurs
2. Y_t/E_t , which represents the estimate of the seasonality associated with time period t after observing Y_t

Holt-Winter's method has four-steps:

1. Compute the base level E_t for time period t using equation (3)
2. Compute the estimated trend value T_t base level E_t for time period t using equation (4)
3. Compute the estimated seasonal index S_t for time period t using equation (5)
4. Compute the final forecast Y_{t+k} for time period $t+k$ using equation (3)

Equations (3) and (5) assume that at time period t an estimate of the seasonal index from the time period $t-p$ exists or that there is a value for S_{t-p} . First thing to do is to estimate the values for $S_1, S_2, S_3, \dots, S_p$.

$$S_t = p * Y_t / (Y_1 + Y_2 + \dots + Y_p) \quad (7)$$

Equation (6) indicates that the initial seasonal estimate S_t for each of the first p time periods is the ratio of the observed value in time period Y_t divided by the average value observed during the first p periods. Appropriate values for the initial base level and trend estimates are also needed to start the procedure.

A forecast is never completely accurate. Forecasts always deviate from the actual. The difference is called as forecast error (Russell and Taylor, 2000:471). The most popular measures of forecast accuracy are mean absolute deviation (MAD) and mean absolute percent error (MAPE) and mean square error (MSE). The lower values of these indicators mean more accurate forecasts. The error measures are computed for a sample of observations as follows:

The mean absolute deviation, or MAD, is the average of absolute difference between forecast and actual demand, as computed by the following formula.

$$\text{MAD} = \sum_{i=1}^n \frac{|Y_i - \hat{Y}_i|}{n} \quad (8)$$

Mean absolute percent error, or MAPE, is calculated as firstly dividing MAD value by actual observation, then multiplying it by 100. The formula for MAPE:

$$\text{MAPE} = \frac{100}{n} \sum_{i=1}^n \frac{|Y_i - \hat{Y}_i|}{Y_i} \quad (9)$$

Mean squared error, or MSE is also used as a measure of forecast error. MSE is the average of squared forecast errors. The square root of MSE is called root mean square error (RMSE).

$$\text{MSE} = \sum_{i=1}^n \frac{(Y_i - \hat{Y}_i)^2}{n} \quad (10)$$

The theft data covering 53-month period (January 2000- May 2004) of the three biggest cities of Turkey (Istanbul, Izmir and Ankara), were obtained from the General Security of Directorate of Turkey. In addition to them, 24-month period (January 2001- December 2002) theft statistics of Yenimahalle neighborhood of Ankara were used in forecasts (Appendix AA). The theft data includes all kinds of thefts such as thefts from houses and workplaces, thefts of animals, auto theft and thefts from auto, street thefts (stealing by snatching). To check the seasonality in the data multiplicative seasonality index method was used (Russell and Taylor, 2000:469). For period t of the year y , the seasonality index, SI_t is computed from $SI_t = (Y_t / \hat{Y}_y)$ where $\hat{Y}_y$ is the average monthly crime in year y . The monthly crime numbers and the seasonal indices are presented in tables 34-37. As an example the seasonality indices for Ankara data are plotted in figure 6.1 Seasonality indices generally appear to be smaller for theft in the summer months than the other months of the year. The number of thefts is increasing in the winter and fall months. One of the reasons for this difference maybe the fluctuations in the unemployment rate affected by seasonal jobs.

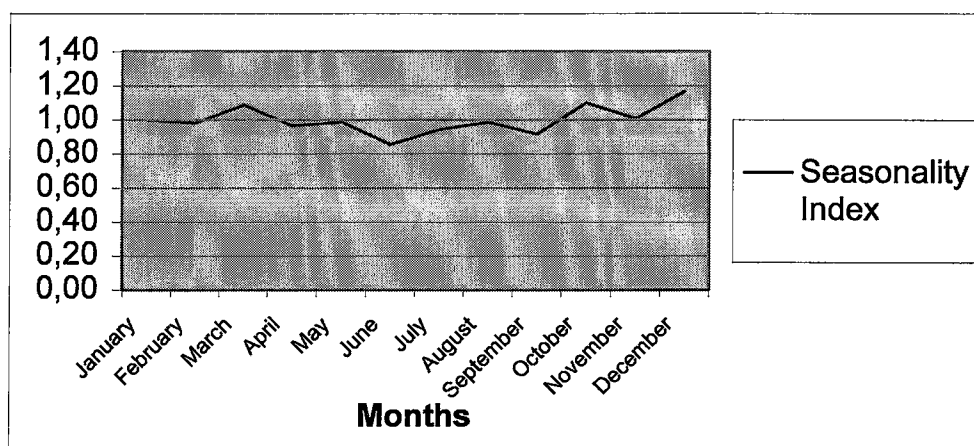


Figure 6.1 Monthly Seasonality Index of Thefts in Ankara

The variability of seasonality indices is lower for Ankara than Yenimahalle. The standard deviation of the average seasonality indices in the last column of table 35 is 0,084 whereas the standard deviation of the last column of table 37 is 0,205. This maybe explained, in part, by the aggregation of crime variabilities as the total number of incidents for Ankara is found by summing the crime figures of several sub-regions including Yenimahalle.

The monthly data prior to 2000 was not available, so we had to work with the limited data available. We acknowledge that for this reason the estimates of seasonality indices may not be very precise. The readers are cautioned that our conclusions should be viewed with this limitation in mind. On the other hand, we expect that the seasonality patterns observed in the 4 years, for which we have data available, are likely to be similar for other years. The examples presented in this chapter, mainly illustrate how the crime data can be utilized for short term forecasting purposes.

Table 34. Seasonal Indices of Thefts in Istanbul

MONTHS	2000			2001			2002			2003			AVERAGE	
	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	S.INDEX	S.INDEX
January	3755	3453	1,09	5347	4861	1,10	4100	3730	1,10	4235	4648	0,91	0,91	1,05
February	3642	3453	1,05	6058	4861	1,25	3961	3730	1,06	3678	4648	0,79	0,79	1,04
March	3866	3453	1,12	6064	4861	1,25	4063	3730	1,09	4301	4648	0,93	0,93	1,10
May	3607	3453	1,04	5841	4861	1,20	3932	3730	1,05	4105	4648	0,88	0,88	1,05
April	3442	3453	1,00	5896	4861	1,21	4301	3730	1,15	6821	4648	1,47	1,47	1,21
June	3268	3453	0,95	5007	4861	1,03	3274	3730	0,88	4272	4648	0,92	0,92	0,94
July	2881	3453	0,83	4211	4861	0,87	3322	3730	0,89	5311	4648	1,14	1,14	0,93
August	3385	3453	0,98	3480	4861	0,72	3308	3730	0,89	4835	4648	1,04	1,04	0,91
September	3016	3453	0,87	3977	4861	0,82	3398	3730	0,91	4672	4648	1,01	1,01	0,90
November	3177	3453	0,92	4103	4861	0,84	3784	3730	1,01	4669	4648	1,00	1,00	0,95
October	3373	3453	0,98	4105	4861	0,84	3452	3730	0,93	4170	4648	0,90	0,90	0,91
December	4032	3453	1,17	4246	4861	0,87	3867	3730	1,04	4710	4648	1,01	1,01	1,02

Table 35. Seasonal Indices of Thefts in Ankara

MONTHS	2000			2001			2002			2003			AVERAGE	
	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	S.INDEX	S.INDEX
January	528	563	0,94	803	884	0,91	878	898	0,98	1211	1031	1,17	1,17	1,00
February	605	563	1,07	857	884	0,97	898	898	1,00	909	1031	0,88	0,88	0,98
March	590	563	1,05	917	884	1,04	1002	898	1,12	1187	1031	1,15	1,15	1,09
May	503	563	0,89	761	884	0,86	875	898	0,97	1177	1031	1,14	1,14	0,97
April	493	563	0,88	890	884	1,01	881	898	0,98	1118	1031	1,08	1,08	0,99
June	511	563	0,91	698	884	0,79	654	898	0,73	1023	1031	0,99	0,99	0,85
July	516	563	0,92	852	884	0,96	823	898	0,92	1013	1031	0,98	0,98	0,94
August	668	563	1,19	787	884	0,89	937	898	1,04	856	1031	0,83	0,83	0,99
September	553	563	0,98	805	884	0,91	840	898	0,94	868	1031	0,84	0,84	0,92
November	641	563	1,14	1021	884	1,15	1084	898	1,21	934	1031	0,91	0,91	1,10
October	524	563	0,93	1030	884	1,17	917	898	1,02	944	1031	0,92	0,92	1,01
December	623	563	1,11	1193	884	1,35	998	898	1,11	1136	1031	1,10	1,10	1,17

Table 36. Seasonal Indices of Thefts in Izmir

MONTHS	2000			2001			2002			2003			AVERAGE	
	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	AVERAGE	S.INDEX
January	685	558	1,23	722	615	1,17	794	645	1,23	945	1014	0,93	1,14	0,93
February	685	558	1,23	569	615	0,93	593	645	0,92	839	1014	0,83	0,97	0,83
March	558	558	1,00	686	615	1,12	732	645	1,13	1112	1014	1,10	1,09	1,10
May	650	558	1,16	636	615	1,03	690	645	1,07	938	1014	0,93	1,05	0,93
April	550	558	0,99	606	615	0,99	618	645	0,96	1074	1014	1,06	1,00	1,06
June	501	558	0,90	576	615	0,94	559	645	0,87	1106	1014	1,09	0,95	0,95
July	460	558	0,82	556	615	0,90	553	645	0,86	899	1014	0,89	0,87	0,87
August	469	558	0,84	633	615	1,03	590	645	0,91	950	1014	0,94	0,93	0,93
September	479	558	0,86	521	615	0,85	545	645	0,84	924	1014	0,91	0,87	0,87
November	574	558	1,03	626	615	1,02	616	645	0,96	882	1014	0,87	0,97	0,87
October	490	558	0,88	577	615	0,94	647	645	1,00	1317	1014	1,30	1,03	1,03
December	602	558	1,08	678	615	1,10	799	645	1,24	1177	1014	1,16	1,15	1,15

Table 37. Seasonal Indices of Thefts In Yenimahalle Neighbourhood

MONTHS	2001			2002			AVERAGE	
	ACTUAL	AVERAGE	S.INDEX	ACTUAL	AVERAGE	S.INDEX	AVERAGE	S.INDEX
January	115	153	0,75	123	140	0,88	0,82	
February	124	153	0,81	94	140	0,67	0,74	
March	145	153	0,95	107	140	0,76	0,86	
May	128	153	0,84	100	140	0,71	0,78	
April	159	153	1,04	122	140	0,87	0,96	
June	170	153	1,11	111	140	0,79	0,95	
July	111	153	0,73	163	140	1,16	0,94	
August	158	153	1,03	176	140	1,26	1,14	
September	135	153	0,88	136	140	0,97	0,93	
November	196	153	1,28	189	140	1,35	1,32	
October	184	153	1,20	177	140	1,26	1,23	
December	210	153	1,37	179	140	1,28	1,33	

To implement Holt-Winter's method the spreadsheets were prepared for Excel and its solver function is used. By changing the β , α and γ values between (0 and 1), the software found the optimum solutions. The objective function of the solver for each run was the minimization of one of MAD, MAPE and RMSE values. The spreadsheets are displayed in Appendix AC-AF. The minimized forecast error values are displayed in tables 38-41. The errors are in acceptable limits. MAPE values are between % 10 and % 15.

Table 38. Optimal values of β , α and γ for each performance measure (Istanbul data)

	R.M.S.E	MAD	MAPE
Constants/Min. Values	708,800	559,159	11,759
Alpha	0,571	0,661	0,412
Beta	0	1,12E-071	1,12E-07
Gamma	0,475	0,702	0,519

Table 39. Optimal values of β , α and γ for each performance measure (Ankara data)

	R.M.S.E	MAD	MAPE
Constants/Min. Values	154,696	126,247	13,24
Alpha	0,708	0,856	0,818
Beta	0,003	0,003	0
Gamma	0,866	0,728	0,835

Table 40. Optimal values of β , α and γ for each performance measure (Izmir data)

	R.M.S.E	MAD	MAPE
Constants/Min. Values	121,776	88,482	10,66
Alpha	0,361	0,380	0,344
Beta	0,006	0	4,51E-05
Gamma	0,6101	0,359	0,397

Table 41. Optimal values of β , α and γ for each performance measure (Yenimahalle data)

	R.M.S.E	MAD	MAPE
Constants/Min. Values	16,750	20,422	14,957
Alpha	0,383	0,534	0,534
Beta	0	0,039	0,039
Gamma	1	1	1

Figures 6.2 - 6.5 display the graphs of the predictions obtained using Holt-Winter’s method against actual data. The predictions in all cases appear to be close to the actual observations.

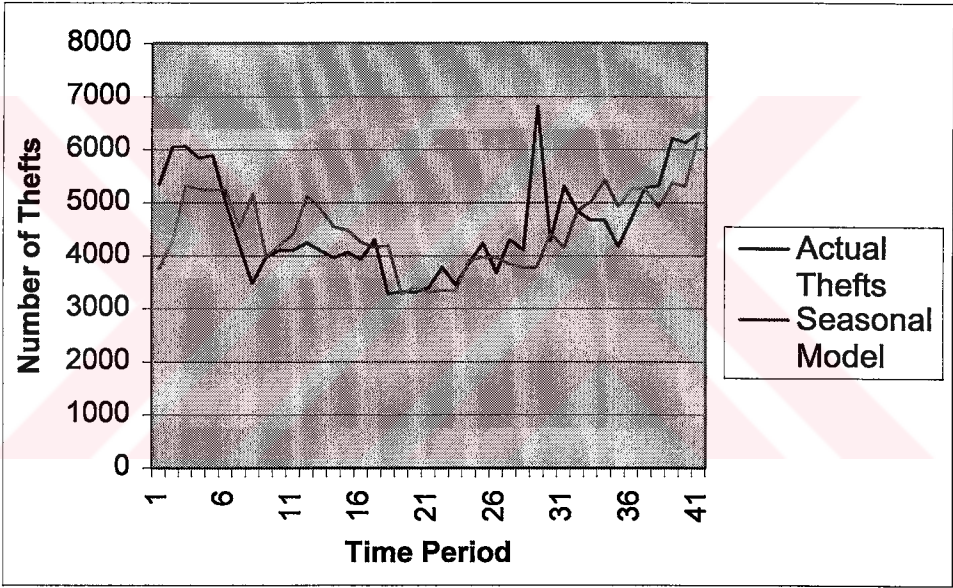


Figure 6. 2 Actual and Predicted Thefts in Istanbul

Table 39 shows that there is a stable trend in data for Ankara ($\beta=0$). The high values for α and γ indicate fast changing level and seasonal patterns . The results for Istanbul (table 38) show relatively more slowly changing level and seasonal components. The results in tables 40 and 41 can be interpreted in a similar manner.

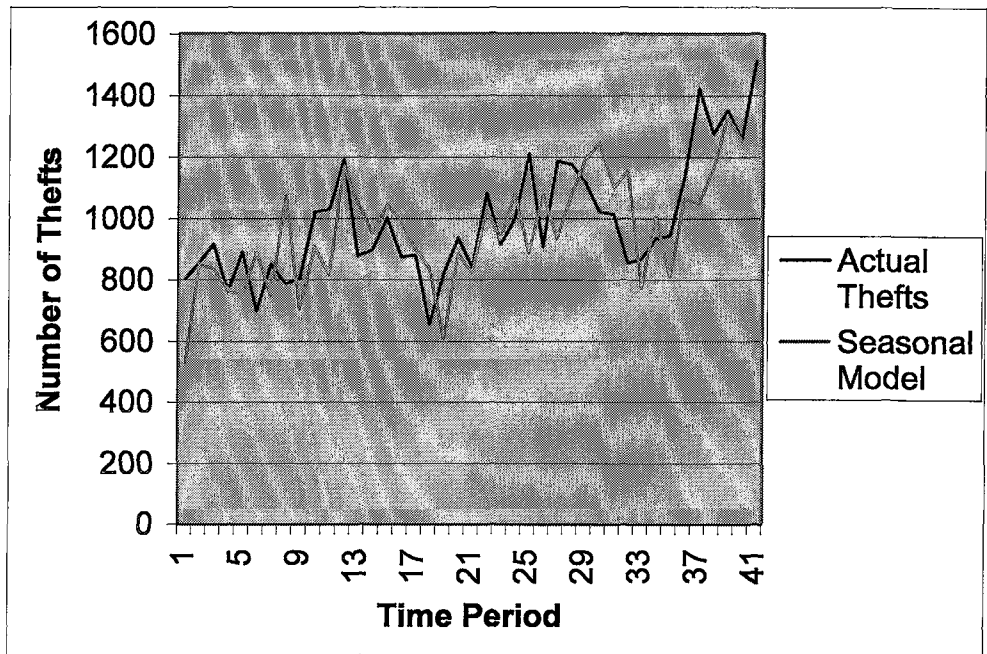


Figure 6.3 Actual and Predicted Thefts in Ankara

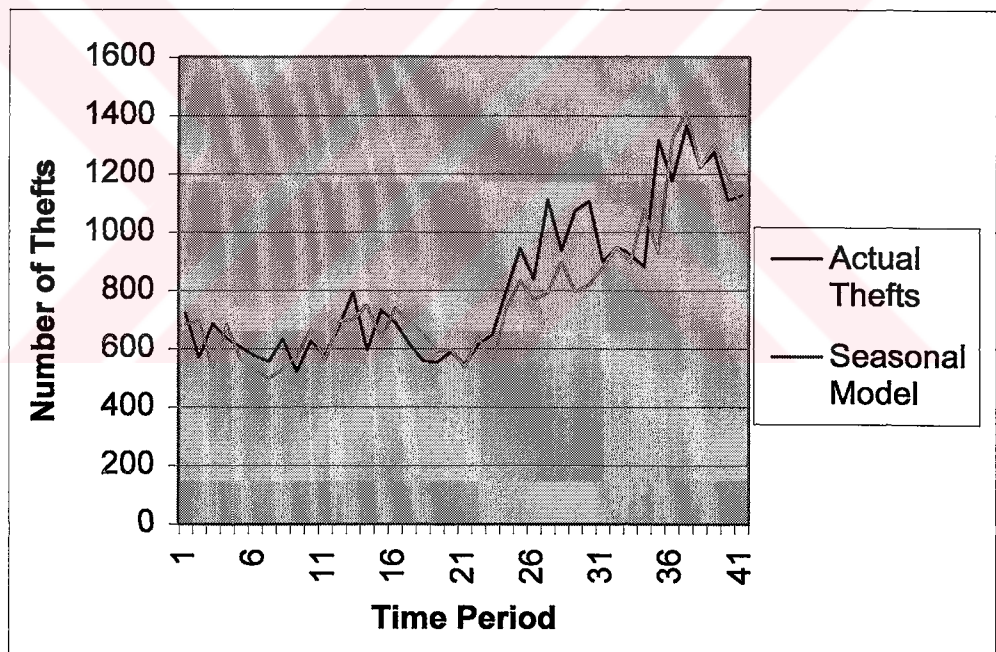


Figure 6.4 Actual and Predicted Thefts in Izmir

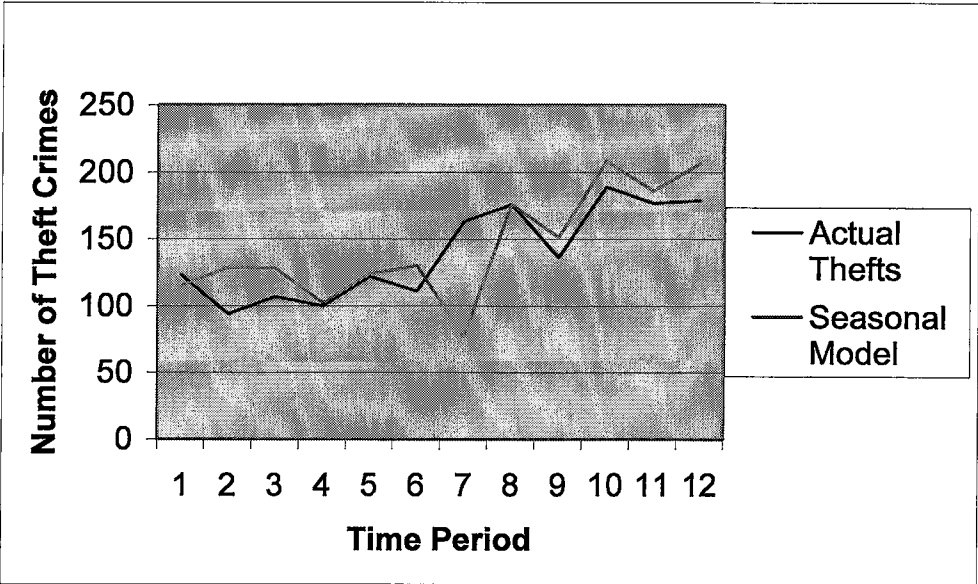


Figure 6.5 Actual and Predicted Thefts in Yenimahalle

The spreadsheets in Appendix AC-AF can be used to compute forecasts for any future time period. According to equation (2) at time period 53 (May 2004), the forecast for time period $53+k$ is presented by:

$$\hat{y}_{t+53} = (E_{53} + kT_t) S_{53+k-p}$$

As an example, if formulas are applied for Ankara, the resulting forecasts are displayed in table 42. Same study can be performed for other cities and Yenimahalle neighborhood.

Table 42.Forecasts of Thefts In Ankara for Four Months

MONTHS	FORMULA	ESTIMATES
June 2004	$(\text{Base Level}_{53} + 1 * \text{Trend}_{53}) * \text{S. Index}_{42}$	1557
July 2004	$(\text{Base Level}_{53} + 2 * \text{Trend}_{53}) * \text{S. Index}_{43}$	1640
August 2004	$(\text{Base Level}_{53} + 3 * \text{Trend}_{53}) * \text{S. Index}_{44}$	1752
September 2004	$(\text{Base Level}_{53} + 4 * \text{Trend}_{53}) * \text{S. Index}_{45}$	1602

CHAPTER VII

CONCLUSION

Crime news receives a big coverage from media. People are interested in crime. It is a fact that crime is everywhere. Most people fear being a victim and hence change their life styles. People who can afford choose the most secure and isolated places to live. Others avoid going out to some insecure places in late hours. Governments spend huge amount of money on the way to fight crime. In Turkey, the cost of crime in terms of indirect expenditures has not been calculated. But in Western countries` indirect expenditures are estimated to be at least as high as expenditures. Consequently crime studies are very important both in monetary and citizens` welfare aspects. Security and crime prevention issues are very much important than past and will reserve its importance.

Law enforcement agencies` main objective is to prevent crime. On the other hand fighting crime cannot be successful without support of citizens, governmental and non-governmental institutions. Synchronization of institutions` activities is very important. Turkey has the highest young population among European Countries. Youngsters should be given more opportunities to spend their time in educational and recreational facilities. They must be informed about drug and alcohol use at every chance.

There is a significant increase in crime rates in Turkey. In 1990 the total numbers of recorded crimes was 95.747, it jumped to 321.805 in 2003 (only in police area). It should be clarified whether it is a real increase or official statistics are distorted. The only way to overcome this problem is crime victimization surveys. The State Institution of Statistics of Turkey can perform these surveys. Once crime was a local problem, now it is an international concern. All around the world, United Nations Interregional Crime and Justice Research Center organize crime victimization surveys.³ More than 70 countries have the membership of the organization. Not only developed countries are members, but also relatively less developed countries like Zambia, Bulgaria, Belarus, Zimbabwe, South Korea have the membership. Turkey must join to the organization to find out the real crime statistics and follow the international studies.

Law enforcement agencies should follow sociological and economic changes as closely as possible. Turkey has the lower GDP per capita than developed countries. As the income level increases, the agencies should be prepared for the increase in crimes especially in property crimes.

Surprisingly the unemployment rate is negatively related to crimes in Turkey. Cochran (2000) claimed that the reason for this kind of relationship maybe the wrong measurement of unemployment rates. People, who lost his or her job, do not commit a crime immediately. The duration of unemployment has a positive correlation with crime rates. Second reason maybe the social bonds. Citizens and families help the people and children who need financial and psychological support.

³ www.unicri.it retrieved at 01.06.2004

Population density is an important crime-inducing factor. A planned urbanization and reverse immigration to rural regions will be effective in crime prevention. Cities will be safer, if fewer people live in less denser area.

Clear up rate is as vital as the workforce of law enforcement agencies. The changes in laws, such as shorter custody time and the long procedure of search warrant, change the way the law enforcement agencies work. Now law enforcement agencies have less time to solve crimes and identify criminals. In one-day custody time, the law enforcement agencies should find enough evidences, which guide investigations. Technological innovations opened a new era for the crime fighters. Efficient use of criminal laboratories and Crime Scene Analysis units in criminal investigations increase the number of solved crimes. The agencies must follow the technological changes.

Law enforcement agencies like other institutions need long-term and short-term forecasts. In order to take measures and allocate sources, it is very important to forecast accurately the future occurrences. The quantitative forecasting methods obviously are useful to aid management in making planning decisions. Short-term, even one-month-period forecasts are enough for law enforcement and crime prevention purposes. Since the sources of law enforcement are highly mobile and can be moved to hot spot areas immediately (Gorr and Olligschlaeger, 2002).

Crime studies are very important. In Turkey there have been only a limited number of studies. The academicians and scientists from different disciplines must be encouraged to study crime.



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APPENDIX A. Institutional Budgets

	2000 (Million TL)	2001 (Million TL)
Hazine müsteşarlığı	26.036.753.000	21.621.381.001
Maliye bakanlığı	7.808.728.500	10.941.483.486
Milli savunma bakanlığı	4.136.500.000	5.126.505.000
Milli eğitim	3.350.330.000	4.046.305.625
Sağlık bakanlığı	1.059.855.000	1.280.660.000
Emniyet genel müdürlüğü	937.037.000	1.176.463.000
Jandarma genel komutanlığı	664.504.000	831.647.000
Başbakanlık	370.292.000	400.601.001
Adalet bakanlığı	360.828.000	451.414.000
Diyanet işleri	257.300.000	302.112.100
Tarım ve köy işleri	236.816.500	317.813.001
İçişleri bakanlığı	209.287.500	264.833.000
Bayındırlık ve İskan bakanlığı	197.373.500	188.054.000
Dışişleri bakanlığı	169.474.000	208.537.000
Kültür bakanlığı	120.938.800	158.058.000
TBMM	116.440.200	106.800.000
Ulaştırma bakanlığı	75.739.500	107.783.000
Orman bakanlığı	74.924.800	93.646.000
Sanayi ve ticaret bakanlığı	6.230.500	75.640.001
Turizm bakanlığı	57.380.500	72.594.600
Tapu ve kadastro	56.677.000	65.252.000
Gümrük müsteşarlığı	54.465.500	54.803.100
Enerji bakanlığı	48.220.500	80.021.000
Devlet İstatistik Enstitüsü	40.637.500	23.858.800
Sahil güvenlik	33.252.700	43.672.000
Çalışma ve sosyal güvenlik	28.571.500	27.172.750
Dış ticaret müsteşarlığı	24.680.000	29.688.895
Çevre bakanlığı	23.531.000	28.374.000
Meteoroloji	20.495.800	25.073.500
Sayıştay	17.595.400	22.234.180
Devlet planlama	13.845.000	16.628.000
Cumhurbaşkanlığı	13.690.000	13.690.181
Denizcilik müsteşarlığı	11.382.000	19.270.000
Yargıtay	6.746.000	8.948.500
Danıştay	4.714.600	6.079.750
Anayasa mahkemesi	1.123.700	1.481.450

	01.01.2000	01.01.2001
U.S. dollar (Central Bank of Turkey)	540.000 TL	666.000 TL

APPENDIX B. Information About Turkish Law Enforcement Agencies

Law enforcement agencies can be classified as Public Agencies and Private Agencies. Private Law Enforcement Agencies are agencies, which do not take place within the organization of police and gendarmerie forces (The Security Organization Law, Act 3/1). Each agency has its own law, which defines duties, responsibilities and other matters in detail.

The ministry of Interior Affairs is responsible for ensuring security and public order in Turkey. Governors are responsible for the same duty in provinces and district governors are responsible for this duty in districts. The ministry of Interior performs this duty by means of the General Command of the Gendarmerie, The Turkish National Police according to the act 3152 (1985), which is about the duties, and responsibilities of the ministry of interior affairs.

The Turkish Republic is divided into 81 provinces having districts of various numbers according to the 1982 Constitution's Act No: 126. Criterion of defining the provinces and districts are based on geography, economic conditions and necessities of public service. Throughout Turkey, there are a total of 923 districts and 36.596 villages.

APPENDIX B. (cont`d)

Areas of Responsibility

While General directorate of security is responsible for ensuring security and public order within the municipal borders of provinces and districts; gendarmerie is responsible for the performance of the safety and public order in the areas outside of the municipal borders and police duty zone. The General Command of Gendarmerie is responsible for the 91 % of Turkish territories, while the Turkish General Directorate of Security is responsible for the 9 % of the Turkish territories. This forms 41 % of Turkey population that amounts to 27 million reside in gendarmerie region. During the summer season the population in gendarmerie region rises up to 65 %, which is equal to 43 million.

A. General Directorate of Security

General directorate of security, which is a subordinate of ministry of interior, consists of three organizations: Central, provincial, and international organization.

Central Organization: It consists of (1) chief management, (5) vice-chairmen positions, (1) management of audit committee, (1) management of the police academy, (27) management of administrative units, (1) consultant of law affairs, (1) management of the police college, (1) management of traffic research center, (173) management of divisions, (1) private office of paperwork, and the position of civil defense specialist. Provincial Organization: It consists of (81) security management of province, (338) security management of administrative district, (390) security chief positions

APPENDIX B. (cont`d)

of administrative district, (1) division management of border gate, (8) security management of border gate, (9) free area police headquarters, (9) free region police headquarters, (1) free area police point, (12) security management of sub-district, and (1380) security chief of police headquarters.

International organization: General directorate of security has representative offices in Germany, Australia, Denmark, France, Netherlands, Italy, and Bosnia and Herzegovina.

B. General Command of The Gendarmerie

The General Command of the Gendarmerie is subordinated to the Ministry of Interior in matters relating to the performance of the safety and public order duties and responsible to Ministry of Interior. The Gendarmerie of The Republic of Turkey, which is responsible for the maintenance of safety and public order as well as carrying out other duties assigned by laws and regulation, is an armed security and law enforcement force.

Duties of The Gendarmerie

Turkish Gendarmerie is assigned on duties primarily by Act No: 2803 “ The Organization, Duties and Powers of the Gendarmerie ” and then by approximately 500 laws and regulations. The duties of gendarmerie, which are related to public order, can be categorized in two main titles as administrative duties, judicial duties.

APPENDIX B.(cont`d)

Administrative Duties

The administrative duties cover the activities preventing crime in order to perform the protection, safety and public order. The preventing of the smuggling, its surveillance and investigations, and the external guarding of the Departments of Corrections are under the responsibility of the gendarmerie. One of the major duties of gendarmerie is to prevent crime.

JUDICIAL DUTIES

To find out, arrest and transfer the offender/s with their offence evidences to the judicial bodies. In the comprehension of the judicial duties defined as the prosecution of the committed crime, The Internal Security Units of Gendarmerie intervene to the events on behalf of the Public Prosecutor after getting the information on already committed or being committed offences without delay and waiting for no application. If it is a committed crime, the investigation starts with the examination of the crime scene.

The Organization of Gendarmerie

The General Command of Gendarmerie carries out the safety and public order through its subordinate Regional Gendarmerie Commands that have variable of subordinate Provincial Gendarmerie Commands. The Provincial Gendarmerie Commands have a well-organized system in districts and villages. In all of the provinces of Turkey, there are provincial Gendarmerie commands called after the name of provinces where they are situated.

APPENDIX C. Definitions of Variables and Sources of Data

Dependent Variable

CRIME RATE: Number of recorded offences divided by city population. (*100.000), *General directorate of security and General Command of Gendarmerie.*

Economic Variables

EDUCATION LEVEL: Total number of people graduated from universities divided by total city population *State Institution of Statistics.*

ENROLLMENT RATE: Total number of students enrolled in secondary school (in general, vocational and technical schools) divided city population of 10-19 ages. *State Institution of Statistics.*

GDP: Gross Domestic Income per capita in U.S. Dollars. *State Institution of Statistics.*

UNEMPLOYMENT RATE: Number of unemployed divided by total labor force by province. *State Institution of Statistics.*

URBANIZATION RATE: Urban population as a percentage of total population, *State Institution of Statistics.*

APPENDIX C. (cont`d)

Deterrence Variables

POLICE: Number of police workforce in provinces divided by number of total city population (*100.000) *General directorate of security.*

CLEAR-UP RATE: Number of crimes whose offenders' are known divided by crimes. *State Institution of Statistics.*

Demographic Variables

AGE: Number of young man population (between 15 and 25) divided by total city population. *State Institution of Statistics.*

POPULATION DENSITY: Number of people living in each 1000 square meters. *State Institution of Statistics.*

MUNICIPALITY SIZE: Membership in big municipality determined by Büyükşehir Belediye Kanunu No: 3030 Admission Date: 1984 (Dummy variable if big municipality =1, if not = 0.)

APPENDIX D. Correlations of Variables In Police Area in 2000

	EDUCATION	ENROLLME	GDP_\$00	UNEMPLOY	POLICE	THEFTCLE	MURDCLE	PROCRCLE	PERCRCLE	TOTALCLE	YOUNGMAN
EDUCATION	1,000										
ENROLLME	0,698	1,000									
GDP_\$00	0,636	0,737	1,000								
UNEMPLOY	-0,267	-0,472	-0,328	1,000							
POLICE	0,000	-0,111	-0,188	0,009	1,000						
THEFTCLE	-0,124	0,058	0,026	-0,148	-0,060	1,000					
MURDCLE	-0,029	-0,021	-0,049	-0,019	-0,004	0,004	1,000				
PROCRCLE	-0,219	-0,010	-0,113	-0,208	0,026	0,924	0,066	1,000			
PERCRCLE	-0,124	0,023	-0,196	-0,312	0,159	0,414	0,209	0,541	1,000		
TOTALCLE	-0,258	-0,066	-0,226	-0,174	0,153	0,794	0,113	0,927	0,714	1,000	
YOUNGMAN	0,173	-0,121	-0,127	0,196	0,669	-0,093	0,108	-0,020	0,068	0,093	1,000
POPDENST	0,272	0,118	0,315	0,143	-0,131	-0,247	-0,143	-0,336	-0,840	-0,534	-0,042
CITY SIZE	0,339	0,149	0,348	0,202	-0,202	-0,231	-0,055	-0,389	-0,394	-0,453	-0,107
URBANIZA	0,452	0,245	0,326	0,444	-0,162	-0,219	-0,110	-0,377	-0,487	-0,426	0,119
THEFT	0,329	0,175	0,334	-0,013	-0,069	-0,454	-0,163	-0,665	-0,450	-0,787	-0,200
MURDER	-0,063	-0,015	0,154	0,065	-0,085	-0,034	-0,152	-0,097	-0,593	-0,246	-0,142
CRIMPRO	0,358	0,260	0,392	-0,142	-0,065	-0,408	-0,174	-0,570	-0,406	-0,703	-0,265
CRIMPER	0,158	0,188	0,123	-0,283	0,291	-0,036	-0,089	-0,029	0,199	0,074	-0,041
TOTALCRI	0,296	0,261	0,293	-0,255	0,145	-0,247	-0,152	-0,333	-0,100	-0,342	-0,172

	POPDENST	CITY SIZE	URBANIZA	THEFT	MURDER	CRIMPRO	CRIMPER	TOTALCRI
POPDENST	1,000							
CITY SIZE	0,334	1,000						
URBANIZA	0,411	0,576	1,000					
THEFT	0,328	0,453	0,255	1,000				
MURDER	0,476	0,153	0,187	0,197	1,000			
CRIMPRO	0,361	0,411	0,154	0,957	0,209	1,000		
CRIMPER	-0,088	0,039	-0,212	0,300	-0,023	0,443	1,000	
TOTALCRI	0,145	0,251	-0,047	0,715	0,101	0,829	0,869	1,000

APPENDIX E. Correlations of Variables In Police Area in 2001

	EDUCATION	ENROLLME	GDP_\$01	UNEMPLOY	POLICE	THEFTCLE	MURDCLE	PROCLE	PERCLEA	TOTCLEA	YOUNGMAN
EDUCATION	1,000										
ENROLLME	0,719	1,000									
GDP_\$01	0,607	0,689	1,000								
UNEMPLOY	-0,282	-0,472	-0,309	1,000							
POLICE	-0,156	-0,188	-0,140	0,181	1,000						
THEFTCLE	-0,132	0,004	-0,026	-0,149	-0,156	1,000					
MURDCLE	-0,053	-0,018	-0,161	0,096	-0,046	0,098	1,000				
PROCLE	-0,192	-0,035	-0,117	-0,198	-0,118	0,960	0,122	1,000			
PERCLEA	-0,166	-0,047	-0,217	-0,350	-0,063	0,429	0,069	0,471	1,000		
TOTCLEA	-0,313	-0,129	-0,305	-0,175	-0,031	0,781	0,151	0,870	0,637	1,000	
YOUNGMAN	0,160	-0,119	-0,117	0,204	0,236	-0,137	0,087	-0,121	-0,068	-0,019	1,000
POPDENS	0,274	0,131	0,290	0,138	-0,059	-0,263	-0,087	-0,282	-0,777	-0,504	-0,043
CITY SIZE	0,345	0,169	0,335	0,193	-0,135	-0,257	-0,109	-0,347	-0,345	-0,435	-0,110
URBANIZA	0,443	0,281	0,301	0,442	-0,074	-0,215	-0,017	-0,319	-0,472	-0,437	0,121
THEFT	0,398	0,236	0,405	-0,068	-0,053	-0,475	-0,093	-0,542	-0,453	-0,754	-0,140
MURDER	0,039	0,080	0,190	-0,003	-0,057	0,023	0,089	-0,033	-0,157	-0,178	-0,253
CRIMPRO	0,431	0,290	0,437	-0,154	-0,054	-0,469	-0,091	-0,503	-0,461	-0,704	-0,131
CRIMPER	0,172	0,209	0,152	-0,379	0,044	-0,187	-0,050	-0,069	0,093	0,018	-0,016
TOTALCRI	0,328	0,285	0,312	-0,313	-0,010	-0,369	-0,069	-0,312	-0,202	-0,345	-0,089

	POPDENS	CITY SIZE	URBANIZA	THEFT	MURDER	CRIMPRO	CRIMPER	TOTALCRI
POPDENS	1,000							
CITY SIZE	0,337	1,000						
URBANIZA	0,411	0,575	1,000					
THEFT	0,399	0,464	0,258	1,000				
MURDER	0,106	0,210	0,161	0,257	1,000			
CRIMPRO	0,445	0,426	0,218	0,978	0,228	1,000		
CRIMPER	-0,071	0,008	-0,256	0,334	-0,072	0,459	1,000	
TOTALCRI	0,204	0,255	-0,033	0,744	0,078	0,832	0,861	1,000

APPENDIX F. Correlations of Variables In Cities including Gendarmerie Region in 2000

	EDUCATION	ENROLLME	GDP_\$00	UNEMPLOY	LAWENFO	THEFTCLE	MURDCLE	PROCRCLE	PERCRCLE	TOTALCLE	YOUNGMAN
EDUCATION	1,000										
ENROLLME	0,707	1,000									
GDP_\$00	0,646	0,744	1,000								
UNEMPLOY	-0,263	-0,459	-0,305	1,000							
LAWENFO	0,059	-0,089	-0,149	0,090	1,000						
THEFTCLE	-0,163	0,035	-0,004	-0,142	-0,070	1,000					
MURDCLE	-0,142	-0,076	-0,208	-0,078	0,096	0,204	1,000				
PROCRCLE	-0,278	-0,072	-0,160	-0,173	0,007	0,925	0,288	1,000			
PERCRCLE	-0,149	0,004	-0,225	-0,310	0,081	0,438	0,463	0,561	1,000		
TOTALCLE	-0,322	-0,130	-0,289	-0,175	0,114	0,778	0,337	0,921	0,749	1,000	
YOUNGMAN	0,162	-0,124	-0,124	0,206	0,749	-0,094	0,047	-0,015	0,045	0,088	1,000
POPDENST	0,279	0,129	0,323	0,144	-0,085	-0,262	-0,295	-0,346	-0,843	-0,565	-0,041
CITY SIZE	0,351	0,166	0,362	0,201	-0,124	-0,256	-0,222	-0,406	-0,432	-0,495	-0,107
URBANIZA	0,452	0,264	0,357	0,456	0,037	-0,248	-0,311	-0,398	-0,495	-0,484	0,124
THEFT	0,424	0,258	0,406	0,106	-0,098	-0,509	-0,287	-0,726	-0,610	-0,872	-0,152
MURDER	-0,043	0,024	0,141	-0,042	-0,059	-0,040	-0,420	-0,081	-0,534	-0,230	-0,176
CRIMPRO	0,478	0,334	0,468	0,038	-0,106	-0,479	-0,309	-0,677	-0,620	-0,842	-0,181
CRIMPER	0,360	0,329	0,218	-0,163	0,235	-0,140	-0,092	-0,202	0,057	-0,133	0,013
TOTALCRI	0,492	0,385	0,411	-0,062	0,057	-0,376	-0,243	-0,534	-0,361	-0,602	-0,108

	POPDENST	CITY SIZE	URBANIZA	THEFT	MURDER	CRIMPRO	CRIMPER	TOTALCRI
POPDENST	1							
BIGMAJOR	0,340	1,000						
URBANIZA	0,410	0,572	1,000					
THEFT	0,491	0,582	0,534	1,000				
MURDER	0,412	0,130	0,195	0,223	1,000			
CRIMPRO	0,557	0,584	0,529	0,973	0,268	1,000		
CRIMPER	-0,005	0,275	0,182	0,417	0,011	0,482	1,000	
TOTALCRI	0,349	0,514	0,430	0,835	0,175	0,886	0,833	1,000

APPENDIX G. Correlations of Variables In Cities including Gendarmerie Region in 2001

	EDUCATION	ENROLLME	GDP_\$01	UNEMPLOY	LAWENF	THEFTCLE	MURDCLE	PROCLE	PERCLEA	TOTCLEA	YOUNGMAN
EDUCATION	1,000										
ENROLLME	0,721	1,000									
GDP_\$01	0,613	0,694	1,000								
UNEMPLOY	-0,263	-0,452	-0,284	1,000							
LAWENF	0,070	-0,054	-0,105	0,071	1,000						
THEFTCLE	-0,145	0,000	-0,048	-0,172	-0,149	1,000					
MURDCLE	0,090	0,044	-0,045	-0,047	-0,030	0,210	1,000				
PROCLE	-0,213	-0,046	-0,170	-0,233	-0,063	0,945	0,125	1,000			
PERCLEA	-0,155	-0,031	-0,212	-0,380	-0,111	0,458	0,148	0,519	1,000		
TOTCLEA	-0,155	-0,031	-0,212	-0,380	-0,111	0,458	0,148	0,519	1,000		
YOUNGMAN	0,162	-0,115	-0,111	0,206	0,741	-0,150	0,059	-0,087	-0,081	1,000	
POPDENS	0,279	0,136	0,294	0,144	-0,073	-0,276	-0,086	-0,323	-0,788	-0,788	1,000
CITY SIZE	0,351	0,176	0,342	0,201	-0,129	-0,277	-0,080	-0,400	-0,358	-0,358	-0,107
URBANIZA	0,452	0,299	0,326	0,456	0,050	-0,254	-0,049	-0,384	-0,484	-0,484	0,124
THEFT	0,464	0,283	0,432	0,086	-0,017	-0,522	-0,022	-0,648	-0,595	-0,595	-0,090
MURDER	0,017	0,095	0,155	-0,041	-0,209	-0,048	0,190	-0,142	-0,081	-0,081	-0,204
CRIMPRO	0,527	0,349	0,474	0,011	0,025	-0,506	-0,020	-0,610	-0,613	-0,613	-0,059
CRIMPER	0,417	0,373	0,303	-0,194	0,266	-0,281	0,162	-0,262	-0,074	-0,074	0,080
TOTALCRI	0,548	0,409	0,458	-0,086	0,145	-0,468	0,065	-0,527	-0,438	-0,438	0,000

	POPDENS	CITY SIZE	URBANIZA	THEFT	MURDER	CRIMPRO	CRIMPER	TOTALCRI
POPDENS	1,000							
CITY SIZE	0,340	1,000						
URBANIZA	0,410	0,572	1,000					
THEFT	0,575	0,586	0,538	1,000				
MURDER	0,096	0,170	0,068	0,211	1,000			
CRIMPRO	0,626	0,556	0,533	0,983	0,182	1,000		
CRIMPER	0,075	0,307	0,225	0,453	0,012	0,528	1,000	
TOTALCRI	0,447	0,513	0,459	0,865	0,126	0,912	0,830	1,000

APPENDIX H. The Long Forms of Abbreviations

ABBREVIATIONS	THE LONG FORMS
EDUCATION	Education Level
ENROLLME	Enrollment Rate
GDP_\$00	Average Income Level In 2000
GDP_\$01	Average Income Level In 2001
UNEMPLOY	Unemployment Rate
LAWENF	Law Enforcement Officers
THEFTCLE	The Clear up Rate of Thefts
MURDCLE	The Clear up Rate of Murders
PROCLE	The Clear up Rate of Crimes against Property
PERCLEA	The Clear up Rate of Crimes against Persons
TOTCLEA	The Clear up Rate of Total Crimes
YOUNGMAN	The Proportion of Young Men
POPDENS	Population Density
CITY SIZE	Size of the City
URBANIZA	Urbanization Level
THEFT	Theft Rate
MURDER	Murder Rate
CRIMPRO	Property Crimes Rate
CRIMPER	Crimes Against Persons Rate
TOTALCRI	Total Crime Rate

APPENDIX I. Education Statistics for 2000 (Number of Graduates by Sex)

	HIGHER EDUCATION		HIGH SCHOOL		VOCATIONAL HIGH SCHOOL	
CITIES	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
ADANA	46.988	29.894	98.862	81.770	30.031	16.196
ADİYAMAN	10.958	3.477	30.649	13.937	5.770	2.990
AFYON	17.034	7.460	36.246	20.693	17.883	7.175
AĞRI	5.630	1.694	18.644	4.790	5.024	1.078
AMASYA	9.312	4.063	20.429	10.829	10.194	3.598
ANKARA	233.805	169.647	306.770	261.458	112.094	64.794
ANTALYA	75.259	50.064	103.586	81.785	37.053	24.718
ARTVİN	5.496	2.009	11.568	5.727	5.474	2.360
AYDIN	25.507	16.308	34.518	30.026	16.103	9.181
BALIKESİR	31.976	17.379	47.368	35.729	25.907	11.812
BİLECİK	4.834	2.095	9.917	5.286	7.237	2.856
BİNGÖL	4.332	1.092	11.965	3.466	3.629	995
BİTLİS	5.974	1.777	20.368	5.735	5.067	1.423
BOLU	7.739	3.945	12.994	8.427	8.492	3.651
BURDUR	7.511	3.403	11.550	8.058	5.776	2.967
BURSA	63.133	37.125	105.398	83.867	55.260	25.992
ÇANAKKALE	14.303	7.389	22.014	15.139	12.499	5.685
ÇANKIRI	6.147	2.532	14.123	7.852	7.331	2.715
ÇORUM	11.630	4.708	18.607	10.786	8.085	3.417
DENİZLİ	23.307	13.448	33.544	26.313	15.379	9.643
DİYARBAKIR	21.744	8.569	59.942	25.537	12.159	4.499
EDİRNE	11.623	7.353	21.343	14.884	11.141	5.711
ELAZIĞ	16.012	6.541	39.380	18.493	10.266	3.184
ERZİNCAN	8.822	2.846	23.874	11.167	6.936	256
ERZURUM	22.501	8.239	60.680	26.580	16.900	5.428
ESKİŞEHİR	25.291	16.453	42.613	35.869	27.112	93
GAZİANTEP	20.930	10.447	50.293	28.338	9.792	4.443
GİRESUN	11.626	5.318	37.622	17.470	9.836	5.432
GÜMÜŞHANE	3.966	1.139	10.389	4.526	3.333	1.195
HAKKARİ	4.042	791	13.679	2.725	3.941	580
HATAY	24.860	13.229	57.431	39.937	13.574	6.313
ISPARTA	17.058	7.866	33.619	22.266	14.404	6.700
İÇEL	46.339	27.774	91.906	73.777	24.761	14.724
İSTANBUL	415.360	292.336	642.720	560.098	160.873	106.096
İZMİR	139.438	101.900	187.045	169.857	80.617	46.438
KARS	6.166	2.409	18.205	8.062	4.652	1.437
KASTAMONU	7.693	3.399	10.979	7.224	8.955	3.096
KAYSERİ	29.189	14.096	53.552	37.007	20.376	7.948
KIRKLARELİ	9.530	5.624	15.246	12.429	11.807	4.721
KIRŞEHİR	6.152	2.548	13.235	9.257	5.564	2.538

APPENDIX I. (cont`d)

	HIGHER EDUCATION		HIGH SCHOOL		VOCATIONAL HIGH SCHOOL	
CITIES	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
KOCAELI	34.703	18.155	64.475	44.777	41.889	15.693
KONYA	52.351	21.802	104.236	57.858	38.151	14.619
KÜTAHYA	14.123	5.739	30.056	14.959	18.563	6.327
MALATYA	24.639	10.935	60.484	36.112	12.667	5.531
MANİSA	24.086	13.447	39.799	30.345	21.012	11.284
K.MARAŞ	20.798	7.477	46.393	24.039	14.332	6.108
MARDİN	9.327	2.694	30.018	9.280	5.906	1.902
MUĞLA	28.566	18.366	37.558	28.366	17.179	9.614
MUŞ	4.671	1.494	15.582	4.793	4.155	1.013
NEVŞEHİR	7.008	3.649	12.969	8.028	5.459	2.601
NİĞDE	6.998	3.912	14.946	10.596	6.042	2.866
ORDU	15.431	7.436	38.178	24.755	13.385	7.032
RİZE	8.780	3.918	19.857	11.631	6.868	3.610
SAKARYA	17.701	7.879	34.316	21.927	19.572	7.651
SAMSUN	27.462	16.397	48.065	37.870	20.019	10.121
SİİRT	3.927	1.053	11.393	2.552	3.326	697
SİNOP	4.768	2.556	6.549	4.455	3.841	1.804
SİVAS	17.122	7.355	43.370	24.145	14.342	5.082
TEKİRDAĞ	18.316	10.578	32.074	24.194	19.684	8.233
TOKAT	16.381	6.321	36.444	20.356	16.224	6.748
TRABZON	30.935	14.562	73.445	45.513	17.651	10.576
TUNCELİ	2.733	960	9.254	3.522	2.721	640
ŞANLIURFA	19.390	5.495	52.372	16.973	9.810	2.948
UŞAK	7.425	3.804	12.417	9.505	6.511	3.334
VAN	11.818	3.810	33.320	9.860	8.404	2.315
YOZGAT	12.331	3.953	34.798	17.078	8.904	3.961
ZONGULDAK	13.999	8.511	25.135	19.542	16.622	6.059
AKSARAY	7.194	3.149	16.766	9.394	4.371	1.839
BAYBURT	2.111	444	4.590	1.518	1.670	429
KARAMAN	5.397	2.190	10.156	6.373	3.635	1.814
KIRIKKALE	9.010	3.586	29.501	14.434	10.028	3.157
BATMAN	6.203	1.706	19.075	5.810	4.734	1.145
ŞIRNAK	4.611	972	15.717	2.454	3.986	335
BARTIN	3.467	1.869	5.264	3.327	3.207	1.354
ARDAHAN	2.272	775	7.382	2.782	1.572	614
İĞDIR	2.886	1.222	8.361	4.326	1.581	789
YALOVA	6.124	3.172	9.666	7.336	4.858	2.481
KARABÜK	6.358	3.161	9.190	6.699	7.420	2.550
KİLİS	2.189	789	4.612	2.094	1.304	640
OSMANIYE	10.671	4.966	28.295	18.554	7.388	3.764
DÜZCE	6.730	3.090	13.760	8.643	7.735	3.433

APPENDIX J. Education Statistics for 2000(Number of Graduates at each level)

CITIES	Illiterate	Total of literate	No School Completed	Primary * School	Primary Education	Junior High School	Junior Vocational School	High School	Vocational School	Higher School
ADANA	212.623	1.408.027	382.752	554.088	52.822	111.329	3.198	180.632	46.227	76.882
ADİYAMAN	106.295	421.856	148.718	153.138	18.005	33.142	772	44.586	8.760	14.435
AFYON	83.841	630.606	149.917	303.857	19.996	48.565	1.519	56.939	25.058	24.494
AĞRI	136.998	290.727	117.073	111.032	8.568	16.593	404	23.434	6.102	7.324
AMASYA	41.436	287.523	67.196	127.028	13.385	20.514	811	31.258	13.792	13.375
ANKARA	243.415	3.377.410	654.371	1.134.826	109.683	318.662	9.936	568.228	176.888	403.452
ANTALYA	122.553	1.421.367	285.105	611.250	36.046	105.835	10.112	185.371	61.771	125.323
ARTVİN	22.976	151.586	33.208	64.718	7.838	12.604	460	17.295	7.834	7.505
AYDIN	108.017	752.298	176.957	373.622	22.433	45.613	1.985	64.544	25.284	41.815
BALIKESİR	114.487	869.558	174.353	422.647	36.647	61.967	3.180	83.097	37.719	49.355
BİLECİK	14.978	162.560	30.019	79.762	6.849	12.905	726	15.203	10.093	6.929
BİNGÖL	57.300	159.925	57.216	60.197	5.561	11.215	248	15.431	4.624	5.424
BITLİS	87.677	230.112	85.169	78.059	7.970	17.862	544	26.103	6.490	7.751
BOLU	25.616	221.634	47.170	107.854	6.063	14.745	528	21.421	12.143	11.684
BURDUR	23.995	209.213	41.850	104.247	8.325	14.768	645	19.608	8.743	10.914
BURSA	158.537	1.757.611	374.724	788.446	58.236	160.116	5.139	189.265	81.252	100.258
ÇANAKKALE	45.040	386.081	71.149	197.469	13.988	24.873	1.385	37.153	18.184	21.692
ÇANKIRI	28.663	213.726	49.148	95.277	6.728	21.129	619	21.975	10.046	8.679
ÇORUM	89.118	438.683	121.309	218.793	15.161	25.683	741	29.393	11.502	16.338
DENİZLİ	79.552	683.366	149.055	344.625	21.686	44.957	1.379	59.857	25.022	36.755

* Primary Education: The compulsory primary education was changed to 8 years from 5 years in 1997.The difference between primary education and primary schools comes from this change.

APPENDIX J. (cont'd)

CITIES	Illiterate	Total of literate	No School Completed	Primary School	Primary Education	Junior High School	Junior Vocational School	High School	Vocational School	Higher School
DIYARBAKIR	341.295	780.885	322.321	243.930	27.825	52.718	1.337	85.479	16.658	30.313
EDİRNE	40.901	331.695	59.316	160.686	12.960	25.455	1.014	36.227	16.852	18.976
ELAZIĞ	89.023	414.481	118.031	149.736	14.720	37.015	965	57.873	13.450	22.553
ERZINCAN	35.738	245.941	58.791	95.781	8.526	26.022	776	35.041	9.192	11.668
ERZURUM	131.950	674.661	204.756	254.248	21.064	52.416	1.727	87.260	22.328	30.740
ESKİŞEHİR	45.389	599.056	107.715	250.273	27.841	53.681	2.422	78.482	36.644	41.744
G. ANTEP	175.258	905.379	292.725	401.305	28.256	57.293	1.432	78.631	14.235	31.377
GİRESUN	78.319	392.287	107.773	156.426	14.071	32.456	1.160	55.092	15.268	16.944
GÜMÜŞHANE	22.384	142.304	38.725	60.646	5.831	12.203	305	14.915	4.528	5.105
HAKKARİ	55.530	133.937	52.695	38.835	4.459	11.901	275	16.404	4.521	4.833
HATAY	151.647	933.172	268.485	407.420	36.717	63.558	1.573	97.368	19.887	37.909
İSPARTA	37.149	427.988	84.736	184.805	15.967	38.978	1.498	55.885	21.104	24.924
İÇEL	157.983	1.299.578	331.895	537.474	45.880	101.224	3.697	165.683	39.485	74.113
İSTANBUL	593.606	8.386.260	1.703.739	3.476.500	243.199	756.676	27.388	1.202.818	266.969	707.696
İZMİR	250.627	2.827.560	568.725	1.202.607	86.610	234.928	9.161	356.902	127.055	241.338
KARS	47.462	230.813	74.463	92.099	6.402	16.532	360	26.267	6.089	8.572
KASTAMONU	65.914	277.465	70.956	140.002	7.919	16.674	553	18.203	12.051	11.092
KAYSERİ	103.662	829.342	208.872	364.647	29.284	62.232	2.044	90.559	28.324	43.285
KIRKLARELİ	21.590	281.822	52.961	137.594	8.563	22.662	654	27.675	16.528	15.154
KIRŞEHİR	28.158	197.520	49.001	83.893	9.246	15.755	302	22.492	8.102	8.700

APPENDIX J. (cont'd)

CITIES	Illiterate	Total of literate	No School Completed	Primary School	Primary Education	Junior High School	Junior Vocational School	High School	Vocational School	Higher School
KOCAELİ	85.711	992.405	222.298	425.261	31.724	89.875	3.362	109.252	57.582	52.858
KONYA	189.274	1.718.069	418.476	836.612	48.787	120.645	4.186	162.094	52.770	74.153
KÜTAHYA	64.581	527.593	119.594	261.008	16.015	39.917	1.259	45.015	24.890	19.862
MALATYA	110.085	641.427	170.178	226.889	28.264	63.920	1.707	96.596	18.198	35.574
MANİSA	155.858	980.694	228.844	523.215	27.803	57.989	2.434	70.144	32.296	37.533
K. MARAŞ	141.845	713.986	215.249	298.900	25.990	52.974	1.598	70.432	20.440	28.275
MARDİN	164.757	407.621	166.514	136.149	14.039	30.939	715	39.298	7.808	12.021
MUĞLA	47.385	604.887	111.927	296.433	14.691	40.099	2.044	65.924	26.793	46.932
MUŞ	113.782	258.645	107.837	90.974	9.548	18.005	537	20.375	5.168	6.165
NEVŞEHİR	31.811	242.826	59.133	117.287	7.985	18.216	476	20.997	8.060	10.657
NİĞDE	41.668	261.683	69.384	122.487	7.293	16.575	444	25.542	8.908	16.310
ORDU	131.665	647.983	184.632	282.509	23.413	48.981	1.409	62.933	20.417	22.867
RİZE	40.539	288.877	71.103	129.615	10.029	22.480	800	31.488	10.478	12.698
SAKARYA	61.971	615.042	140.281	299.405	16.099	48.321	1.837	56.243	27.223	25.580
SAMSUN	147.540	922.313	257.158	419.894	27.489	56.174	1.611	85.935	30.140	43.859
SIİRT	65.664	143.878	61.938	44.761	4.139	9.871	203	13.945	4.023	4.980
SİNOP	35.313	166.095	47.290	82.526	4.984	10.027	275	11.004	5.645	7.324
SİVAS	97.024	567.640	158.296	226.696	21.142	47.818	1.632	67.515	19.424	24.477
TEKİRDAĞ	39.752	529.129	103.372	248.707	14.981	47.489	1.478	56.268	27.917	28.894
TOKAT	103.371	618.371	169.047	276.946	19.529	48.829	1.431	56.800	22.972	22.702

APPENDIX J. (cont`d)

CITIES	Illiterate	Total of literate	No School Completed	Primary School	Primary Education	Junior High School	Junior Vocational School	High School	Vocational School	Higher School
TRABZON	100.702	774.249	193.178	290.422	28.782	66.578	2.527	118.958	28.227	45.497
TUNCELİ	14.689	71.842	14.559	26.341	3.248	7.594	203	12.776	3.361	3.693
Ş.ÜRFA	378.542	794.782	311.699	296.026	25.663	52.148	1.538	69.345	12.758	24.885
UŞAK	36.096	253.578	58.659	124.687	8.168	18.544	486	21.922	9.845	11.229
VAN	222.401	473.895	197.614	163.415	13.777	28.812	642	43.180	10.719	15.628
YOZGAT	82.108	511.985	145.122	221.826	20.111	42.608	1.043	51.876	12.865	16.284
ZONGULDAK	68.044	490.594	119.163	228.840	16.502	35.025	978	44.677	22.681	22.510
AKSARAY	46.976	296.932	84.398	138.123	10.137	20.946	591	26.160	6.210	10.343
BAYBURT	11.416	73.192	22.127	33.296	2.082	4.792	110	6.108	2.099	2.555
KARAMAN	21.946	191.541	47.061	97.203	5.741	11.540	541	16.529	5.449	7.587
KIRIKKALE	36.986	303.338	74.625	108.779	13.735	35.350	299	43.935	13.185	12.596
BATMAN	106.458	260.306	113.087	82.796	9.225	16.781	404	24.885	5.879	7.909
ŞIRNAK	94.472	181.384	77.554	58.054	4.909	12.526	884	18.171	4.321	5.583
BARTIN	26.594	139.955	36.365	73.094	4.489	7.259	319	8.591	4.561	5.336
ARDAHAN	18.178	100.056	29.765	44.762	3.051	6.866	261	10.164	2.186	3.047
İĞDIR	34.840	107.209	40.173	35.693	3.726	8.221	222	12.687	2.370	4.108
YALOVA	10.872	142.949	28.455	61.585	4.445	14.271	251	17.002	7.339	9.296
KARABÜK	26.730	177.937	38.555	79.672	8.751	14.814	658	15.889	9.970	9.519
KİLİS	19.319	79.474	24.583	33.747	3.670	5.589	170	6.706	1.944	2.978
OSMANIYE	55.801	343.384	92.971	129.076	14.339	32.276	1.018	46.849	11.152	15.637
DÜZCE	29.789	252.620	61.703	123.274	6.602	16.879	672	22.403	11.168	9.820

APPENDIX K. Numbers of Students Enrolled in Schools in 2000

CITIES	SECONDARY SCHOOL		
	GENERAL	VOCATIONAL and TECHNICAL	TOTAL
ADANA	51.188	27.314	78.502
ADİYAMAN	15.087	5.281	20.368
AFYON	10.852	10.530	21.382
AĞRI	3.785	2.865	6.650
AMASYA	7.729	5.912	13.641
ANKARA	122.471	71.746	194.217
ANTALYA	35.973	16.053	52.026
ARTVİN	3.410	5.754	9.164
AYDIN	20.692	10.723	31.415
BALIKESİR	22.909	14.589	37.498
BİLECİK	2.992	4.652	7.644
BİNGÖL	3.387	1.791	5.178
BİTLİS	3.897	2.162	6.059
BOLU	10.285	11.169	21.454
BURDUR	4.873	3.549	8.422
BURSA	39.756	41.837	81.593
ÇANAKKALE	8.811	6.699	15.510
ÇANKIRI	2.663	4.545	7.208
ÇORUM	12.014	7.142	19.156
DENİZLİ	14.891	11.044	25.935
DİYARBAKIR	25.430	5.187	30.617
EDİRNE	8.308	6.925	15.233
ELAZIĞ	17.810	5.450	23.260
ERZİNCAN	5.909	4.034	9.943
ERZURUM	14.816	8.471	23.287
ESKİŞEHİR	19.003	14.111	33.114
GAZİANTEP	25.287	10.707	35.994
GİRESUN	8.351	8.455	16.806
GÜMÜŞHANE	2.542	1.962	4.504
HAKKARİ	2.754	1.937	4.691
HATAY	38.130	11.292	49.422
ISPARTA	10.362	7.238	17.600
İÇEL	39.598	20.416	60.014
İSTANBUL	223.538	160.174	383.712
İZMİR	82.533	53.631	136.164
KARS	5.568	2.559	8.127
KASTAMONU	5.170	6.403	11.573
KAYSERİ	28.134	18.112	46.246
KIRKLARELİ	6.881	6.204	13.085
KIRŞEHİR	7.054	3.800	10.854

APPENDIX K. (Cont`d)

CITIES	SECONDARY SCHOOL		
	GENERAL	VOCATIONAL and TECHNICAL	TOTAL
KOCAELİ	24.114	25.362	49.476
KONYA	37.041	23.854	60.895
KÜTAHYA	9.321	11.166	20.487
MALATYA	24.068	8.191	32.259
MANİSA	22.357	17.544	39.901
K.MARAŞ	19.351	12.135	31.486
MARDİN	8.684	3.223	11.907
MUĞLA	13.778	8.282	22.060
MUŞ	4.380	2.199	6.579
NEVŞEHİR	5.041	3.814	8.855
NİĞDE	5.321	3.777	9.098
ORDU	12.065	10.966	23.031
RİZE	7.056	7.117	14.173
SAKARYA	11.473	12.856	24.329
SAMSUN	32.992	17.509	50.501
SİİRT	3.179	1.811	4.990
SİNOP	3.701	3.199	6.900
SİVAS	13.024	10.850	23.874
TEKİRDAĞ	10.700	10.839	21.539
TOKAT	10.685	10.612	21.297
TRABZON	20.034	14.322	34.356
TUNCELİ	2.709	550	3.259
ŞANLIURFA	14.216	5.869	20.085
UŞAK	7.552	4.114	11.666
VAN	9.797	3.850	13.647
YOZGAT	8.438	9.026	17.464
ZONGULDAK	16.098	11.979	28.077
AKSARAY	7.175	3.177	10.352
BAYBURT	1.305	1.533	2.838
KARAMAN	4.286	2.902	7.188
KIRIKKALE	9.506	6.547	16.053
BATMAN	7.926	2.010	9.936
ŞIRNAK	3.051	544	3.595
BARTIN	2.838	3.605	6.443
ARDAHAN	2.280	1.200	3.480
İĞDIR	3.419	1.369	4.788
YALOVA	3.536	3.220	6.756
KARABÜK	5.317	4.863	10.180
KİLİS	2.135	1.579	3.714
OSMANİYE	13.786	6.219	20.005
DÜZCE	7.100	3.900	11.000

APPENDIX L. Average Income Statistics
(GDP per capita, US Dollars)

CITIES	2000	2001
ADANA	3.286	2.339
ADİYAMAN	1.250	918
AFYON	1.727	1.263
AĞRI	824	568
AMASYA	2.049	1.439
ANKARA	4.148	2.752
ANTALYA	2.911	2.193
ARTVİN	2.815	2.137
AYDIN	2.932	2.017
BALIKESİR	2.819	2.005
BİLECİK	3.521	2.584
BİNGÖL	1.065	795
BİTLİS	883	646
BOLU	5.687	4.216
BURDUR	2.728	1.951
BURSA	3.491	2.507
ÇANAKKALE	3.465	2.335
ÇANKIRI	1.604	1.136
ÇORUM	2.276	1.654
DENİZLİ	2.807	2.133
DİYARBAKIR	1.691	1.313
EDİRNE	3.613	2.403
ELAZIĞ	2.253	1.704
ERZİNCAN	1.530	1.158
ERZURUM	1.452	1.061
ESKİŞEHİR	3.369	2.513
G.ANTEP	2.102	1.593
GİRESUN	1.874	1.443
GÜMÜŞHANE	1.491	1.075
HAKKARİ	1.122	836
HATAY	2.452	1.751
ISPARTA	2.107	1.510
İÇEL	3.297	2.452
İSTANBUL	4.416	3.063
İZMİR	4.302	3.215
KARS	1.134	886
KASTAMONU	2.409	1.851
KAYSERİ	2.308	1.806
KIRKLARELİ	4.370	3.590
KIRŞEHİR	1.928	1.488
KOCAELİ	7.556	6.155

CITIES	2000	2001
KONYA	2.241	1.554
KÜTAHYA	2.256	1.805
MALATYA	1.863	1.417
MANİSA	3.292	2.459
K. MARAŞ	1.930	1.584
MARDIN	1.151	983
MUĞLA	4.253	3.308
MUŞ	725	578
NEVŞEHİR	2.908	2.117
NİĞDE	2.503	1.781
ORDU	1.375	1.064
RİZE	2.441	1.897
SAKARYA	2.953	2.108
SAMSUN	2.325	1.680
SİİRT	1.399	1.111
SİNOP	1.879	1.459
SİVAS	1.751	1.399
TEKİRDAĞ	3.412	2.498
TOKAT	1.771	1.370
TRABZON	1.927	1.506
TUNCELİ	1.991	1.584
Ş.URFA	1.301	1.008
UŞAK	2.047	1.436
VAN	1.118	859
YOZGAT	1.250	852
ZONGULDAK	3.779	2.969
AKSARAY	1.427	966
BAYBURT	1.308	1.017
KARAMAN	2.799	2.012
KIRIKKALE	3.416	2.725
BATMAN	1.558	1.216
ŞIRNAK	830	638
BARTIN	1.355	1.061
ARDAHAN	1.058	842
İĞDIR	1.168	855
YALOVA	4.665	3.463
KARABÜK	2.236	1.587
KİLİS	2.317	1.817
OSMANİYE	1.560	1.157
DÜZCE	1.639	1.142

APPENDIX M. Unemployment Data for 2000

CITIES	EMPLOYED		UNEMPLOYED	
	MALE	FEMALE	MALE	FEMALE
ADANA	377.845	194.760	66.522	28.667
ADYAMAN	115.707	93.419	19.930	6.206
AFYON	209.987	156.290	15.099	4.095
AĞRI	102.771	81.085	18.197	2.248
AMASYA	95.687	58.608	5.280	2.604
ANKARA	1.010.476	368.223	107.732	61.845
ANTALYA	473.342	287.172	43.668	21.177
ARTVIN	48.900	31.376	4.073	2.003
AYDIN	265.110	184.871	17.194	9.058
BALIKESİR	301.985	172.996	16.346	8.825
BİLECİK	58.057	27.486	2.672	1.551
BİNGÖL	56.376	40.717	7.856	2.064
BİTLİS	71.851	48.296	14.946	2.379
BOLU	79.750	54.178	4.474	1.884
BURDUR	69.469	41.065	3.612	1.826
BURSA	550.355	275.176	55.952	28.866
ÇANAKKALE	152.617	85.082	5.481	3.388
ÇANKIRI	73.896	49.384	5.538	1.701
ÇORUM	142.614	104.562	10.771	2.433
DENİZLİ	244.937	178.563	11.129	6.875
DİYARBAKIR	239.009	159.146	52.576	13.398
EDİRNE	132.361	64.028	6.316	4.003
ELAZIĞ	119.940	73.980	18.134	5.185
ERZİNCAN	86.078	49.127	7.812	1.986
ERZURUM	196.985	124.621	26.259	6.075
ESKİŞEHİR	170.989	73.319	14.220	8.267
G.ANTEP	271.014	103.654	39.143	9.047
GİRESUN	121.824	92.436	15.243	5.562
GÜMÜŞHANE	44.303	38.686	4.589	876
HAKKARİ	52.308	25.564	8.503	2.143
HATAY	295.709	223.099	27.138	10.108
ISPARTA	141.227	81.110	10.638	4.568
İÇEL	376.168	238.809	48.738	21.287
İSTANBUL	2.573.547	897.853	335.849	169.992
İZMİR	873.949	407.059	94.776	60.401
KARS	82.989	58.661	6.848	2.276
KASTAMONU	101.184	83.380	5.045	2.079
KAYSERİ	243.350	123.983	25.873	8.290
KIRKLARELİ	106.629	59.633	5.692	3.231
KIRŞEHİR	56.498	38.812	6.467	2.038

APPENDIX M. (cont`d)

CITIES	EMPLOYED		UNEMPLOYED	
	MALE	FEMALE	MALE	FEMALE
KOCAELI	331.236	171.714	32.357	13.315
KONYA	512.856	308.076	50.345	12.561
KÜTAHYA	176.151	124.413	11.471	3.392
MALATYA	189.073	122.904	22.983	7.632
MANİSA	354.045	222.988	16.966	10.067
K. MARAŞ	225.359	154.371	25.732	6.538
MARDİN	124.448	88.707	26.976	4.911
MUĞLA	236.505	157.196	10.928	6.737
MUŞ	91.940	80.581	11.801	2.052
NEVŞEHİR	82.352	63.551	5.522	1.777
NİĞDE	87.089	70.273	4.286	2.039
ORDU	208.467	169.792	25.281	7.838
RİZE	84.530	63.842	12.695	4.257
SAKARYA	200.514	114.389	17.532	6.479
SAMSUN	287.321	217.794	22.158	13.742
SİİRT	48.979	28.766	8.053	1.225
SİNOP	56.561	48.599	3.677	1.589
SİVAS	177.942	117.101	17.989	5.148
TEKİRDAĞ	196.274	105.354	12.978	7.286
TOKAT	197.362	144.796	18.088	5.296
TRABZON	230.110	180.155	26.174	10.905
TUNCELİ	32.898	11.720	1.738	1.192
Ş. URFA	257.254	172.177	62.790	9.953
UŞAK	84.407	55.502	5.758	2.636
VAN	159.303	117.983	27.977	5.680
YOZGAT	156.520	127.046	17.038	3.583
ZONGULDAK	161.273	120.937	10.033	5.398
AKSARAY	91.946	66.211	8.892	2.269
BAYBURT	23.693	19.699	1.749	319
KARAMAN	58.168	38.754	4.846	1.848
KIRIKKALE	79.091	36.705	13.903	3.500
BATMAN	67.868	42.215	18.639	4.556
ŞIRNAK	77.106	32.118	11.619	1.493
BARTIN	49.594	47.450	2.633	1.344
ARDAHAN	38.704	307.878	2.607	1.034
İĞDIR	37.956	26.236	5.044	1.254
YALOVA	48.389	24.411	4.453	1.996
KARABÜK	51.823	24.902	4.553	2.261
KİLİS	25.479	12.966	2.115	433
OSMANİYE	86.641	52.819	19.013	5.482
DÜZCE	92.465	64.376	6.691	2.280

APPENDIX N. Police Workforce

CITIES	2000	2001
ADANA	4.368	4.136
ADYAMAN	1.214	1.288
AFYON	623	464
AĞRI	998	1.048
AMASYA	662	762
ANKARA	10.887	12.834
ANTALYA	3.713	4.227
ARTVİN	461	492
AYDIN	1.878	2.146
BALIKESİR	1.785	2.045
BİLECİK	394	502
BİNGÖL	869	929
BİTLİS	961	1.016
BOLU	460	680
BURDUR	492	604
BURSA	4.019	4.614
ÇANAKKALE	662	779
ÇANKIRI	417	501
ÇORUM	879	1.021
DENİZLİ	1.156	1.350
DİYARBAKIR	3.535	3.786
EDİRNE	826	988
ELAZIĞ	1.519	1.645
ERZİNCAN	904	965
ERZURUM	1.454	1.594
ESKİŞEHİR	1.371	1.623
GAZİANTEP	2.568	2.779
GİRESUN	778	896
GÜMÜŞHANE	352	409
HAKKARİ	951	1.008
HATAY	1.862	2.151
ISPARTA	600	750
İÇEL	3.702	4.012
İSTANBUL	23.031	27.746
İZMİR	8.710	9.668
KARS	842	893
KASTAMONU	491	642
KAYSERİ	1.622	1.807
KIRKLARELİ	454	566
KIRŞEHİR	468	559

CITIES	2000	2001
KOCAELİ	1.936	2.423
KONYA	2.799	3.089
KÜTAHYA	627	731
MALATYA	1.815	1.959
MANİSA	1.636	1.863
K.MARAŞ	1.707	1.843
MARDİN	1.926	2.046
MUĞLA	1.483	1.717
MUŞ	829	887
NEVŞEHİR	556	714
NİĞDE	445	539
ORDU	878	1.028
RİZE	796	863
SAKARYA	1.039	1.328
SAMSUN	1.905	2.156
SİİRT	1.046	1.124
SİNOP	395	468
SİVAS	1.514	1.623
TEKİRDAĞ	842	1.000
TOKAT	1.096	1.241
TRABZON	1.080	1.331
TUNCELİ	1.048	1.105
ŞANLIURFA	1.975	2.123
UŞAK	546	683
VAN	1.667	1.775
YOZGAT	518	702
ZONGULDAK	723	919
AKSARAY	494	588
BAYBURT	268	305
KARAMAN	437	517
KIRIKKALE	637	775
BATMAN	1.224	1.324
ŞIRNAK	1.418	1.523
BARTIN	355	456
ARDAHAN	414	448
İĞDIR	607	657
YALOVA	630	758
KARABÜK	506	632
KİLİS	345	489
OSMANİYE	973	1.079
DÜZCE	247	401

APPENDIX O. Gendarmerie Workforce

CITIES	2000	2001
ADANA	444	435
ADYAMAN	342	345
AFYON	281	279
AĞRI	373	373
AMASYA	216	200
ANKARA	803	782
ANTALYA	834	598
ARTVİN	222	219
AYDIN	468	398
BALIKESİR	710	515
BİLECİK	163	171
BİNGÖL	626	619
BİTLİS	472	477
BOLU	254	240
BURDUR	202	195
BURSA	557	534
ÇANAKKALE	319	296
ÇANKIRI	192	189
ÇORUM	303	285
DENİZLİ	325	315
DİYARBAKIR	953	950
EDİRNE	246	237
ELAZIĞ	562	566
ERZİNCAN	306	301
ERZURUM	487	483
ESKİŞEHİR	283	275
GAZİANTEP	397	388
GİRESUN	249	242
GÜMÜŞHANE	178	175
HAKKARİ	391	392
HATAY	412	413
ISPARTA	221	210
İÇEL	443	439
İSTANBUL	1.340	1.208
İZMİR	1.011	763
KARS	291	285
KASTAMONU	325	312
KAYSERİ	303	291
KIRKLARELİ	202	198
KIRŞEHİR	159	155

CITIES	2000	2001
KOCAELİ	343	340
KONYA	513	498
KÜTAHYA	268	256
MALATYA	320	322
MANİSA	375	360
K.MARAŞ	468	481
MARDİN	801	795
MUĞLA	768	462
MUŞ	416	419
NEVŞEHİR	230	170
NİĞDE	148	139
ORDU	410	413
RİZE	199	198
SAKARYA	311	303
SAMSUN	368	360
SIİRT	690	692
SİNOP	179	172
SİVAS	523	521
TEKİRDAĞ	228	234
TOKAT	437	423
TRABZON	330	319
TUNCELİ	875	862
ŞANLIURFA	493	499
UŞAK	185	179
VAN	704	817
YOZGAT	248	236
ZONGULDAK	223	218
AKSARAY	153	149
BAYBURT	96	91
KARAMAN	146	145
KIRIKKALE	169	164
BATMAN	453	451
ŞIRNAK	710	710
BARTIN	137	133
ARDAHAN	175	172
İĞDIR	205	205
YALOVA	124	126
KARABÜK	130	128
KİLİS	118	120
OSMANİYE	214	206
DÜZCE	166	174

APPENDIX P. Young Population in Cities for 2000

CITIES	10-14 Ages	15-19 Ages	20-24 ages	25-29 Ages	Total
ADANA	206.757	207.277	167.973	158.725	533.975
ADIYAMAN	84.843	77.004	57.251	50.033	184.288
AFYON	81.902	88.434	75.856	63.950	228.240
AĞRI	75.850	64.276	54.529	37.667	156.472
AMASYA	35.107	37.156	38.270	27.358	102.784
ANKARA	355.639	409.893	444.505	377.693	1.232.091
ANTALYA	145.555	158.897	158.141	171.401	488.439
ARTVİN	17.287	17.998	17.316	15.284	50.598
AYDIN	89.644	94.126	77.991	72.870	244.987
BALIKESİR	88.391	92.699	89.716	81.577	263.992
BİLECİK	16.235	18.205	21.356	15.981	55.542
BİNGÖL	34.287	30.341	30.883	21.191	82.415
BİTLİS	53.578	48.384	40.172	30.345	118.901
BOLU	21.554	27.125	25.988	22.339	75.452
BURDUR	20.727	22.911	22.530	20.035	65.476
BURSA	188.565	209.462	192.725	194.648	596.835
ÇANAKKALE	33.155	39.848	49.860	35.062	124.770
ÇANKIRI	25.561	27.461	24.586	21.175	73.222
ÇORUM	63.365	61.941	46.968	44.481	153.390
DENİZLİ	76.575	82.884	78.389	71.984	233.257
DİYARBAKIR	185.473	163.122	140.386	109.377	412.885
EDİRNE	29.846	34.361	49.575	30.214	114.150
ELAZIĞ	62.787	65.914	62.022	48.982	176.918
ERZİNCAN	30.280	35.291	38.547	26.563	100.401
ERZURUM	111.937	111.142	103.394	75.210	289.746
ESKİŞEHİR	59.182	69.113	67.313	59.158	195.584
G.ANTEP	155.713	148.673	123.096	111.219	382.988
GİRESUN	53.359	55.969	42.925	37.846	136.740
GÜMÜŞHANE	20.762	21.320	16.641	14.748	52.709
HAKKARİ	29.404	27.470	35.744	17.973	81.187
HATAY	142.986	142.884	123.888	103.732	370.504
ISPARTA	45.486	56.992	62.377	41.678	161.047
İÇEL	178.407	179.574	146.353	143.164	469.091
İSTANBUL	887.898	1.043.067	1.059.601	1.067.011	3.169.679
İZMİR	289.091	325.271	335.920	300.071	961.262
KARS	38.466	34.575	39.006	25.927	99.508
KASTAMONU	33.183	35.411	27.499	25.312	88.222
KAYSERİ	111.903	117.642	100.839	91.099	309.580
KIRKLARELİ	25.337	28.297	37.103	25.989	91.389
KİRŞEHİR	27.472	28.706	21.647	19.441	69.794

APPENDIX P. (cont`d)

CITIES	10-14 Ages	15-19 Ages	20-24 ages	25-29 Ages	Total
KOCAELİ	113.505	127.283	127.368	117.236	371.887
KONYA	231.077	248.210	207.661	176.873	632.744
KÜTAHYA	59.878	68.578	65.853	51.389	185.820
MALATYA	95.087	99.854	86.169	73.160	259.183
MANİSA	118.067	124.762	112.569	100.448	337.779
K. MARAŞ	117.539	120.426	96.260	85.185	301.871
MARDİN	95.418	80.868	70.781	55.973	207.622
MUĞLA	55.269	62.577	66.334	66.931	195.842
MUŞ	67.101	57.245	43.250	32.963	133.458
NEVŞEHİR	31.185	34.088	26.362	26.013	86.463
NİĞDE	37.970	40.632	33.664	28.610	102.906
ORDU	95.567	95.481	74.838	71.332	241.651
RİZE	34.414	36.994	32.321	32.021	101.336
SAKARYA	69.172	77.836	75.887	66.091	219.814
SAMSUN	128.573	125.492	104.874	91.492	321.858
SIİRT	34.822	28.405	28.638	18.934	75.977
SİNOP	24.111	22.086	15.242	14.107	51.435
SİVAS	82.025	83.936	73.919	58.311	216.166
TEKİRDAĞ	51.323	56.376	68.569	57.464	182.409
TOKAT	91.022	91.180	75.162	62.922	229.264
TRABZON	97.924	112.027	96.094	81.221	289.342
TUNCELİ	8.352	9.266	19.612	8.606	37.484
Ş.URFA	198.277	177.520	139.632	113.060	430.212
UŞAK	29.745	31.811	26.997	26.651	85.459
VAN	120.660	99.089	86.688	65.070	250.847
YOZGAT	82.570	80.385	60.856	52.873	194.114
ZONGULDAK	60.927	66.875	56.078	49.785	172.738
AKSARAY	46.805	47.741	39.440	33.728	120.909
BAYBURT	11.421	10.674	8.761	7.712	27.147
KARAMAN	25.481	25.963	20.865	20.222	67.050
KIRIKKALE	41.730	43.982	34.824	30.857	109.663
BATMAN	63.110	52.749	43.172	35.013	130.934
ŞIRNAK	42.957	36.199	51.856	25.529	113.584
BARTIN	17.452	18.530	14.936	13.875	47.341
ARDAHAN	15.396	14.233	15.211	10.454	39.898
İĞDIR	21.298	19.333	17.608	13.914	50.855
YALOVA	14.221	16.751	16.587	14.991	48.329
KARABÜK	19.760	31.778	19.996	18.344	70.118
KİLİS	13.925	12.805	11.208	8.903	32.916
OSMANİYE	51.496	55.325	44.349	38.833	138.507
DÜZCE	28.475	33.014	30.234	29.046	92.294

APPENDIX Q. List of Cities which have Membership in
Big Municipality

1. ADANA
2. ANKARA
3. ANTALYA
4. BURSA
5. DIYARBAKIR
6. ERZURUM
7. ESKİŞEHİR
8. G.ANTEP
9. İÇEL
10. İSTANBUL
11. İZMİR
12. KAYSERİ
13. KOCAELİ
14. KONYA
15. SAKARYA
16. SAMSUN

APPENDIX R. Urbanization Rate and Population Density for
2000

CITIES	POPULATION DENSITY	URBANIZATION RATE
ADANA	133	0,74
ADYAMAN	89	0,53
AFYON	57	0,43
AGRI	46	0,48
AMASYA	64	0,53
ANKARA	163	0,88
ANTALYA	83	0,54
ARTVIN	26	0,44
AYDIN	121	0,52
BALIKESİR	75	0,53
BİLECİK	45	0,62
BİNGÖL	31	0,47
BİTLİS	55	0,57
BOLU	33	0,48
BURDUR	38	0,51
BURSA	204	0,76
ÇANAKKALE	47	0,46
ÇANKIRI	36	0,41
ÇORUM	47	0,52
DENİZLİ	73	0,47
DİYARBAKIR	90	0,60
EDİRNE	66	0,57
ELAZIĞ	67	0,63
ERZİNCAN	27	0,53
ERZURUM	37	0,60
ESKİŞEHİR	51	0,79
GAZİANTEP	188	0,78
GİRESUN	77	0,48
GÜMÜŞHANE	29	0,41
HAKKARİ	33	0,60
HATAY	215	0,47
ISPARTA	62	0,59
İÇEL	107	0,61
İSTANBUL	1928	0,91
İZMİR	281	0,81
KARS	32	0,44
KASTAMONU	29	0,45
KAYSERİ	62	0,67
KIRKLARELİ	52	0,57
KIRŞEHİR	40	0,56

APPENDIX R. (cont`d)

CITIES	POPULATION DENSITY	URBANIZATION RATE
KOCAELİ	334	0,60
KONYA	56	0,56
KÜTAHYA	55	0,45
MALATYA	72	0,57
MANİSA	96	0,57
K.MARAŞ	70	0,52
MARDİN	80	0,55
MUĞLA	56	0,38
MUŞ	56	0,34
NEVŞEHİR	58	0,42
NİĞDE	47	0,36
ORDU	149	0,42
RİZE	93	0,53
SAKARYA	156	0,60
SAMSUN	133	0,51
SİİRT	48	0,58
SİNOP	39	0,43
SİVAS	26	0,56
TEKİRDAĞ	99	0,63
TOKAT	83	0,48
TRABZON	209	0,46
TUNCELİ	13	0,58
ŞANLIURFA	77	0,58
UŞAK	60	0,56
VAN	45	0,50
YOZGAT	49	0,43
ZONGULDAK	186	0,41
AKSARAY	52	0,51
BAYBURT	26	0,42
KARAMAN	27	0,51
KIRIKKALE	65	0,69
BATMAN	98	0,68
ŞIRNAK	49	0,59
BARTIN	89	0,26
ARDAHAN	28	0,28
İĞDIR	47	0,48
YALOVA	199	0,59
KARABÜK	55	0,69
KİLİS	80	0,62
OSMANİYE	147	0,68
DÜZCE	122	0,42

APPENDIX S. Population of Cities in 2000

CITIES	POLICE AREA	GENDARME AREA	TOTAL
ADANA	1.378.723	475.547	1.854.270
ADYAMAN	333.665	290.146	623.811
AFYON	348.751	463.665	812.416
AGRI	252.309	276.435	528.744
AMASYA	195.110	170.121	365.231
ANKARA	3.526.877	480.983	4.007.860
ANTALYA	926.861	799.344	1.726.205
ARTVIN	84.198	107.736	191.934
AYDIN	494.212	458.794	953.006
BALIKESİR	575.380	500.967	1.076.347
BİLECİK	120.693	73.633	194.326
BİNGÖL	120.291	135.104	255.395
BİTLİS	220.402	168.276	388.678
BOLU	130.818	139.836	270.654
BURDUR	130.928	125.875	256.803
BURSA	1.605.854	500.833	2.106.687
ÇANAKKALE	215.571	249.404	464.975
ÇANKIRI	111.185	158.394	269.579
ÇORUM	307.774	289.291	597.065
DENİZLİ	393.542	449.580	843.122
DİYARBAKIR	818.396	545.813	1.364.209
EDİRNE	228.638	173.968	402.606
ELAZIĞ	362.215	210.718	572.933
ERZİNCAN	168.054	147.752	315.806
ERZURUM	560.704	381.636	942.340
ESKİŞEHİR	554.978	151.031	706.009
G.ANTEP	1.014.265	279.584	1.293.849
GİRESUN	250.932	273.078	524.010
GÜMÜŞHANE	77.570	109.383	186.953
HAKKARİ	140.398	95.443	235.841
HATAY	582.631	650.279	1.232.910
ISPARTA	302.756	211.623	514.379
İÇEL	1.021.086	646.921	1.668.007
İSTANBUL	9.119.315	914.163	10.033.478
İZMİR	2.733.157	654.751	3.387.908
KARS	144.321	182.735	327.056
KASTAMONU	169.630	207.095	376.725
KAYSERİ	698.212	351.447	1.049.659
KIRKLARELİ	187.664	140.797	328.461
KIRŞEHİR	141.122	112.117	253.239

APPENDIX S. (cont`d)

CITIES	POLICE AREA	GENDARME AREA	TOTAL
KOCAELİ	723.883	479.452	1.203.335
KONYA	1.249.489	968.480	2.217.969
KÜTAHYA	298.173	358.543	656.716
MALATYA	483.967	369.691	853.658
MANİSA	714.760	545.409	1.260.169
K. MARAŞ	524.091	483.978	1.008.069
MARDİN	391.249	313.849	705.098
MUĞLA	271.515	445.869	717.384
MUŞ	153.368	300.286	453.654
NEVŞEHİR	129.821	180.093	309.914
NİĞDE	126.812	221.269	348.081
ORDU	371.819	515.946	887.765
RİZE	193.457	172.481	365.938
SAKARYA	445.979	300.081	746.060
SAMSUN	619.235	584.446	1.203.681
SİİRT	154.730	110.048	264.778
SİNOP	96.476	129.098	225.574
SİVAS	419.897	332.931	752.828
TEKİRDAĞ	393.160	233.389	626.549
TOKAT	397.602	430.425	828.027
TRABZON	446.478	532.817	979.295
TUNCELİ	54.476	39.108	93.584
Ş. URFA	839.817	597.139	1.436.956
UŞAK	182.284	140.370	322.654
VAN	438.571	438.953	877.524
YOZGAT	296.507	386.412	682.919
ZONGULDAK	250.282	365.317	615.599
AKSARAY	202.435	197.710	400.145
BAYBURT	41.356	56.002	97.358
KARAMAN	125.322	118.077	243.399
KIRIKKALE	264.976	118.532	383.508
BATMAN	305.475	141.244	446.719
ŞIRNAK	208.423	145.638	354.061
BARTIN	48.002	136.176	184.178
ARDAHAN	37.154	96.602	133.756
İĞDIR	81.582	87.052	168.634
YALOVA	98.661	69.932	168.593
KARABÜK	156.028	69.074	225.102
KİLİS	70.670	44.054	114.724
OSMANİYE	314.812	148.384	463.196
DÜZCE	130.632	183.634	314.266

APPENDIX T.Number of Murders in Police Area in 2000 and
2001

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEAR ED	NOT CLEARED	TOTAL
ADANA	58	8	66	70	5	75
ADİYAMAN	9	0	9	4	1	5
AFYON	8	1	9	10	0	10
AĞRI	12	0	12	7	0	7
AMASYA	3	0	3	3	2	5
ANKARA	81	10	91	69	13	82
ANTALYA	35	7	42	41	9	50
ARTVİN	1	0	1	2	0	2
AYDIN	31	2	33	20	1	21
BALIKESİR	12	3	15	22	0	22
BİLECİK	5	1	6	1	2	3
BİNGÖL	1	0	1	1	0	1
BİTLİS	4	0	4	5	0	5
BOLU	4	0	4	3	0	3
BURDUR	2	0	2	4	0	4
BURSA	35	7	42	36	1	37
ÇANAKKALE	6	0	6	7	0	7
ÇANKIRI	2	0	2	3	0	3
ÇORUM	7	3	10	10	3	13
DENİZLİ	19	4	23	27	3	30
DİYARBAKIR	36	8	44	39	13	52
EDİRNE	5	0	5	10	1	11
ELAZIĞ	15	0	15	8	2	10
ERZİNCAN	3	0	3	3	0	3
ERZURUM	7	0	7	5	1	6
ESKİŞEHİR	7	1	8	10	2	12
GAZİANTEP	40	1	41	55	3	58
GİRESUN	10	0	10	7	1	8
GÜMÜŞHANE	0	0	0	2	0	2
HAKKARİ	3	0	3	4	0	4
HATAY	22	2	24	15	8	23
ISPARTA	7	0	7	8	0	8
İÇEL	31	4	35	41	6	47
İSTANBUL	767	287	1054	290	60	350
İZMİR	91	11	102	102	19	121
KARS	5	0	5	6	0	6
KASTAMONU	4	0	4	8	0	8
KAYSERİ	21	0	21	19	2	21
KIRKLARELİ	4	1	5	3	0	3
KİRŞEHİR	3	2	5	2	0	2

APPENDIX T. (cont`d)

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELI	28	4	32	20	7	27
KONYA	42	3	45	43	6	49
KÜTAHYA	2	1	3	4	1	5
MALATYA	17	2	19	18	1	19
MANİSA	23	2	25	25	2	27
K.MARAŞ	15	1	16	12	0	12
MARDİN	12	3	15	10	3	13
MUĞLA	8	1	9	9	0	9
MUŞ	3	0	3	2	0	2
NEVŞEHİR	2	0	2	8	0	8
NİĞDE	7	0	7	0	1	1
ORDU	9	0	9	15	2	17
RİZE	4	0	4	8	0	8
SAKARYA	13	0	13	12	2	14
SAMSUN	22	1	23	20	3	23
SİİRT	0	0	0	2	1	3
SİNOP	3	0	3	1	1	2
SİVAS	5	2	7	8	0	8
TEKİRDAĞ	9	1	10	11	2	13
TOKAT	13	1	14	11	1	12
TRABZON	10	1	11	6	1	7
TUNCELİ	1	0	1	1	0	1
ŞANLIURFA	15	2	17	27	2	29
UŞAK	4	0	4	5	0	5
VAN	10	0	10	8	0	8
YOZGAT	8	1	9	9	0	9
ZONGULDAK	7	1	8	5	1	6
AKSARAY	9	0	9	6	0	6
BAYBURT	0	0	0	0	0	0
KARAMAN	4	0	4	9	1	10
KIRIKKALE	6	0	6	9	0	9
BATMAN	24	1	25	7	1	8
ŞIRNAK	2	0	2	3	0	3
BARTIN	3	0	3	1	0	1
ARDAHAN	0	0	0	0	0	0
İĞDIR	0	1	1	3	0	3
YALOVA	2	0	2	3	1	4
KARABÜK	4	1	5	7	1	8
KİLİS	7	3	10	2	0	2
OSMANİYE	5	0	5	13	1	14
DÜZCE	5	0	5	5	0	5

APPENDIX U.Number of Thefts in Police Area in 2000 and 2001

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	863	830	1.693	1.035	389	1.424
ADYAMAN	122	139	261	99	133	232
AFYON	162	65	227	230	105	335
AGRI	60	164	224	72	165	237
AMASYA	105	153	258	119	230	349
ANKARA	2.421	3.715	6.136	3.232	6.369	9.601
ANTALYA	1.271	4.375	5.646	1.508	5.356	6.864
ARTVIN	28	17	45	67	30	97
AYDIN	782	115	897	845	177	1.022
BALIKESİR	253	316	569	386	523	909
BİLECİK	32	39	71	50	54	104
BİNGÖL	62	27	89	87	57	144
BİTLİS	59	50	109	69	55	124
BOLU	111	36	147	105	35	140
BURDUR	112	103	215	106	36	142
BURSA	1.386	3.523	4.909	2.155	3.918	6.073
ÇANAKKALE	174	127	301	220	151	371
ÇANKIRI	49	74	123	52	85	137
ÇORUM	130	369	499	257	546	803
DENİZLİ	420	186	606	578	84	662
DİYARBAKIR	337	552	889	423	803	1.226
EDİRNE	145	77	222	199	66	265
ELAZIĞ	195	48	243	278	157	435
ERZİNCAN	54	8	62	61	15	76
ERZURUM	178	99	277	149	106	255
ESKİŞEHİR	509	289	798	462	677	1.139
GAZİANTEP	902	3.654	4.556	881	4.245	5.126
GİRESUN	108	102	210	126	85	211
GÜMÜŞHANE	12	23	35	37	19	56
HAKKARİ	17	36	53	23	37	60
HATAY	400	148	548	482	340	822
ISPARTA	147	34	181	231	30	261
İÇEL	1.373	1.326	2.699	1.862	1.479	3.341
İSTANBUL	5.164	25.690	30.854	7.853	36.453	44.306
İZMİR	3.395	2.544	5.939	3.839	2.545	6.384
KARS	74	55	129	82	69	151
KASTAMONU	49	43	92	61	58	119
KAYSERİ	503	167	670	816	252	1.068
KIRKLARELİ	146	102	248	208	127	335
KIRŞEHİR	62	130	192	95	120	215

APPENDIX U.(cont`d)

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	607	174	781	932	663	1.595
KONYA	640	348	988	706	334	1.040
KÜTAHYA	143	81	224	193	199	392
MALATYA	258	216	474	217	118	335
MANİSA	513	219	732	610	454	1.064
K.MARAŞ	270	337	607	379	166	545
MARDİN	270	68	338	141	222	363
MUĞLA	553	468	1.021	805	496	1.301
MUŞ	159	96	255	129	21	150
NEVŞEHİR	118	83	201	131	107	238
NİĞDE	103	36	139	143	54	197
ORDU	124	39	163	187	42	229
RİZE	131	46	177	147	35	182
SAKARYA	335	197	532	334	175	509
SAMSUN	502	56	558	580	96	676
SİİRT	44	9	53	113	13	126
SİNOP	79	38	117	94	88	182
SİVAS	148	93	241	200	92	292
TEKİRDAĞ	300	100	400	445	122	567
TOKAT	102	127	229	149	208	357
TRABZON	246	68	314	268	70	338
TUNCELİ	15	19	34	28	65	93
ŞANLIURFA	397	73	470	734	279	1.013
UŞAK	218	15	233	241	28	269
VAN	185	129	314	196	88	284
YOZGAT	51	129	180	91	69	160
ZONGULDAK	193	33	226	320	111	431
AKSARAY	116	40	156	120	23	143
BAYBURT	13	22	35	10	11	21
KARAMAN	67	9	76	65	6	71
KIRIKKALE	224	206	430	213	197	410
BATMAN	214	92	306	210	117	327
ŞIRNAK	46	29	75	72	71	143
BARTIN	26	29	55	25	66	91
ARDAHAN	15	3	18	28	8	36
İĞDIR	109	17	126	149	7	156
YALOVA	94	78	172	119	133	252
KARABÜK	110	35	145	89	27	116
KİLİS	40	5	45	59	6	65
OSMANİYE	211	253	464	240	308	548
DÜZCE	77	56	133	80	96	176

APPENDIX V. Number of Crimes in Police Area in 2000

CITIES	CRIMES AGAINST PERSONS			CRIMES AGAINST PROPERTY		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	3.911	78	3.989	1.701	1.059	2.760
ADYAMAN	549	5	554	244	172	416
AFYON	628	2	630	430	83	513
AĞRI	632	12	644	256	176	432
AMASYA	382	5	387	278	173	451
ANKARA	12.464	241	12.705	6.020	4.334	10.354
ANTALYA	3.648	150	3.798	2.406	4.832	7.238
ARTVİN	233	2	235	142	31	173
AYDIN	1.883	20	1.903	1.438	199	1.637
BALIKESİR	1.293	27	1.320	702	384	1.086
BİLECİK	216	3	219	143	52	195
BİNGÖL	300	2	302	120	32	152
BİTLİS	491	5	496	141	54	195
BOLU	493	1	494	237	43	280
BURDUR	576	5	581	277	119	396
BURSA	5.490	100	5.590	2.873	3.727	6.600
ÇANAKKALE	552	4	556	356	143	499
ÇANKIRI	596	4	600	185	93	278
ÇORUM	1.189	40	1.229	510	464	974
DENİZLİ	1.031	15	1.046	885	220	1.105
DIYARBAKIR	2.539	95	2.634	784	596	1.380
EDİRNE	460	2	462	288	83	371
ELAZIĞ	745	8	753	398	63	461
ERZİNCAN	172	1	173	94	9	103
ERZURUM	1.290	14	1.304	506	121	627
ESKİŞEHİR	2.428	30	2.458	955	371	1.326
GAZİANTEP	3.571	167	3.738	1.995	3.908	5.903
GİRESUN	542	13	555	326	125	451
GÜMÜŞHANE	233	1	234	59	27	86
HAKKARİ	194	4	198	68	40	108
HATAY	1.119	39	1.158	778	200	978
ISPARTA	658	2	660	297	51	348
İÇEL	4.651	101	4.752	2.531	1.513	4.044
İSTANBUL	15.387	2.534	17.921	18.093	31.285	49.378
İZMİR	7.313	298	7.611	5.724	3.375	9.099
KARS	820	5	825	251	71	322
KASTAMONU	415	3	418	185	58	243
KAYSERİ	2.127	24	2.151	1.385	263	1.648
KIRKLARELİ	374	13	387	286	136	422
KİRŞEHİR	555	13	568	184	167	351

APPENDIX V. (cont`d)

CITIES	CRIMES AGAINST PERSONS			CRIMES AGAINST PROPERTY		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	1.606	31	1.637	1.345	300	1.645
KONYA	2.864	43	2.907	1.496	460	1.956
KÜTAHYA	835	6	841	377	104	481
MALATYA	1.523	38	1.561	603	254	857
MANİSA	1.652	27	1.679	1.006	285	1.291
K.MARAŞ	1.301	30	1.331	608	397	1.005
MARDİN	871	17	888	489	78	567
MUĞLA	1.512	14	1.526	1.132	533	1.665
MUŞ	282	6	288	244	99	343
NEVŞEHİR	806	7	813	307	106	413
NİĞDE	874	1	875	256	44	300
ORDU	771	9	780	313	65	378
RİZE	432	8	440	344	60	404
SAKARYA	1.061	17	1.078	940	272	1.212
SAMSUN	2.073	41	2.114	1.247	113	1.360
SİİRT	323	1	324	111	11	122
SİNOP	251	3	254	172	57	229
SİVAS	878	3	881	364	96	460
TEKİRDAĞ	862	10	872	627	155	782
TOKAT	852	18	870	490	154	644
TRABZON	1.525	16	1.541	612	106	718
TUNCELİ	330	1	331	56	25	81
ŞANLIURFA	1.323	23	1.346	938	102	1.040
UŞAK	914	2	916	489	21	510
VAN	1.116	16	1.132	449	169	618
YOZGAT	490	7	497	257	162	419
ZONGULDAK	1.913	10	1.923	692	42	734
AKSARAY	709	7	716	279	59	338
BAYBURT	216	2	218	47	25	72
KARAMAN	177	2	179	126	10	136
KIRIKKALE	826	11	837	467	260	727
BATMAN	666	33	699	325	108	433
ŞIRNAK	350	2	352	180	33	213
BARTIN	274	0	274	105	34	139
ARDAHAN	163	0	163	54	4	58
İĞDIR	385	2	387	221	24	245
YALOVA	270	3	273	203	104	307
KARABÜK	490	4	494	217	47	264
KİLİS	153	5	158	94	6	100
OSMANİYE	1.174	13	1.187	561	275	836
DÜZCE	194	2	196	295	72	367

APPENDIX W.Number of Crimes in Police Area in 2001

CITIES	CRIMES AGAINST PERSONS			CRIMES AGAINST PROPERTY		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	3.073	62	3.135	1.553	583	2.136
ADYAMAN	651	15	666	177	155	332
AFYON	1.025	11	1.036	365	161	526
AĞRI	918	25	943	169	203	372
AMASYA	550	7	557	203	271	474
ANKARA	13.793	342	14.135	6.679	7.380	14.059
ANTALYA	4.140	151	4.291	2.454	5.825	8.279
ARTVİN	249	3	252	106	31	137
AYDIN	2.652	21	2.673	1.472	260	1.732
BALIKESİR	1.846	29	1.875	704	632	1.336
BİLECİK	288	2	290	109	74	183
BİNGÖL	407	5	412	139	65	204
BİTLİS	436	6	442	105	71	176
BOLU	462	3	465	188	59	247
BURDUR	630	4	634	197	49	246
BURSA	5.539	126	5.665	3.632	4.205	7.837
ÇANAKKALE	634	16	650	331	176	507
ÇANKIRI	802	7	809	151	106	257
ÇORUM	1.571	51	1.622	637	684	1.321
DENİZLİ	1.201	11	1.212	1.030	100	1.130
DİYARBAKIR	2.209	72	2.281	574	850	1.424
EDİRNE	658	4	662	316	84	400
ELAZIĞ	794	19	813	388	174	562
ERZİNCAN	239	0	239	88	18	106
ERZURUM	1.592	22	1.614	301	131	432
ESKİŞEHİR	2.553	43	2.596	734	813	1.547
GAZİANTEP	3.426	129	3.555	1.426	4.558	5.984
GİRESUN	497	5	502	205	119	324
GÜMÜŞHANE	271	0	271	73	25	98
HAKKARİ	231	3	234	66	44	110
HATAY	1.293	47	1.340	696	431	1.127
ISPARTA	632	2	634	365	59	424
İÇEL	4.794	100	4.894	2.843	1.742	4.585
İSTANBUL	19.513	3.157	22.670	22.595	43.571	66.166
İZMİR	7.698	268	7.966	5.457	3.645	9.102
KARS	970	6	976	253	80	333
KASTAMONU	511	4	515	118	66	184
KAYSERİ	3.233	49	3.282	1.372	337	1.709
KIRKLARELİ	454	13	467	317	174	491
KİRŞEHİR	787	16	803	199	154	353

APPENDIX W. (cont`d)

CITIES	CRIMES AGAINST PERSONS			CRIMES AGAINST PROPERTY		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	2.609	72	2.681	1.417	925	2.342
KONYA	3.323	50	3.373	1.285	465	1.750
KÜTAHYA	1.336	12	1.348	417	240	657
MALATYA	1.303	14	1.317	359	167	526
MANİSA	1.676	32	1.708	885	552	1.437
K.MARAŞ	1.650	18	1.668	656	196	852
MARDİN	947	27	974	256	240	496
MUĞLA	1.742	25	1.767	1.257	558	1.815
MUŞ	171	0	171	156	29	185
NEVŞEHİR	641	7	648	222	127	349
NİĞDE	797	3	800	231	66	297
ORDU	773	13	786	285	58	343
RİZE	445	16	461	217	44	261
SAKARYA	1.293	20	1.313	554	266	820
SAMSUN	2.408	37	2.445	964	157	1.121
SİİRT	342	1	343	189	15	204
SİNOP	389	4	393	188	100	288
SİVAS	862	0	862	311	105	416
TEKİRDAĞ	1.098	18	1.116	665	270	935
TOKAT	1.296	9	1.305	371	266	637
TRABZON	1.507	15	1.522	557	95	652
TUNCELİ	393	15	408	78	94	172
ŞANLIURFA	1.963	36	1.999	970	364	1.334
UŞAK	845	3	848	395	41	436
VAN	1.095	12	1.107	357	101	458
YOZGAT	522	1	523	170	98	268
ZONGULDAK	2.238	12	2.250	669	137	806
AKSARAY	785	3	788	211	32	243
BAYBURT	118	1	119	29	13	42
KARAMAN	185	4	189	90	6	96
KIRIKKALE	1.002	16	1.018	382	255	637
BATMAN	674	62	736	336	139	475
ŞIRNAK	286	7	293	104	81	185
BARTIN	357	5	362	98	77	175
ARDAHAN	266	0	266	54	8	62
İĞDIR	423	4	427	216	8	224
YALOVA	335	8	343	172	165	337
KARABÜK	519	5	524	190	37	227
KİLİS	195	1	196	93	6	99
OSMANİYE	1.133	8	1.141	386	332	718
DÜZCE	345	5	350	172	122	294

APPENDIX X.Number of Murders in Gendarmerie Area in 2000
and 2001

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	27	4	31	26	10	36
ADYAMAN	3	0	3	5	1	6
AFYON	15	0	15	12	1	13
AGRI	11	2	13	15	3	18
AMASYA	2	0	2	12	0	12
ANKARA	13	4	17	11	1	12
ANTALYA	31	5	36	31	5	36
ARTVIN	3	0	3	5	0	5
AYDIN	17	4	21	19	2	21
BALIKESİR	17	1	18	18	2	20
BİLECİK	2	0	2	2	1	3
BİNGÖL	7	0	7	1	0	1
BİTLİS	2	0	2	4	0	4
BOLU	5	0	5	5	1	6
BURDUR	10	1	11	2	0	2
BURSA	25	5	30	20	2	22
ÇANAKKALE	12	0	12	8	1	9
ÇANKIRI	6	0	6	4	0	4
ÇORUM	10	0	10	9	0	9
DENİZLİ	21	4	25	21	2	23
DİYARBAKIR	17	1	18	14	0	14
EDİRNE	3	0	3	6	0	6
ELAZIĞ	11	1	12	10	1	11
ERZİNCAN	1	0	1	6	0	6
ERZURUM	13	0	13	16	1	17
ESKİŞEHİR	7	1	8	4	0	4
GAZİANTEP	13	1	14	15	0	15
GİRESUN	15	0	15	18	0	18
GÜMÜŞHANE	6	0	6	3	0	3
HAKKARİ	4	3	7	5	2	7
HATAY	13	5	18	11	1	12
ISPARTA	6	1	7	6	0	6
İÇEL	0	0	0	13	5	18
İSTANBUL	55	16	71	40	18	58
İZMİR	37	2	39	37	3	40
KARS	13	0	13	9	0	9
KASTAMONU	16	0	16	17	0	17
KAYSERİ	8	1	9	21	0	21
KIRKLARELİ	4	0	4	2	0	2
KIRŞEHİR	4	1	5	1	0	1

APPENDIX X.(cont`d)

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	14	4	18	14	4	18
KONYA	36	2	38	22	6	28
KÜTAHYA	18	1	19	10	1	11
MALATYA	14	4	18	8	2	10
MANİSA	25	1	26	32	2	34
K.MARAŞ	0	0	0	19	0	19
MARDİN	5	0	5	11	2	13
MUĞLA	16	3	19	13	1	14
MUŞ	8	0	8	11	1	12
NEVŞEHİR	4	1	5	6	1	7
NİĞDE	9	0	9	11	0	11
ORDU	24	1	25	21	0	21
RİZE	3	0	3	3	1	4
SAKARYA	16	7	23	17	0	17
SAMSUN	26	0	26	24	1	25
SİİRT	4	0	4	2	0	2
SİNOP	10	0	10	4	1	5
SİVAS	9	1	10	8	0	8
TEKİRDAĞ	8	3	11	8	5	13
TOKAT	16	0	16	15	1	16
TRABZON	8	0	8	8	0	8
TUNCELİ	1	0	1	1	0	1
ŞANLIURFA	0	0	0	16	1	17
UŞAK	10	0	10	7	1	8
VAN	17	3	20	9	3	12
YOZGAT	9	2	11	19	3	22
ZONGULDAK	8	0	8	11	2	13
AKSARAY	0	0	0	3	0	3
BAYBURT	2	0	2	0	0	
KARAMAN	4	0	4	6	0	6
KIRIKKALE	1	0	1	8	0	8
BATMAN	2	0	2	2	0	2
ŞIRNAK	7	0	7	1	3	4
BARTIN	6	1	7	7	1	8
ARDAHAN	2	0	2	3	0	3
İĞDIR	4	0	4	5	1	6
YALOVA	2	0	2	4	0	4
KARABÜK	2	1	3	2	0	2
KİLİS	7	2	9	0	0	
OSMANİYE	8	0	8	5	1	6
DÜZCE	4	0	4	10	0	10

APPENDIX Y. Number of Thefts in Gendarmerie Area in 2000 and 2001

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	107	70	177	62	35	97
ADIYAMAN	14	4	18	4	4	8
AFYON	53	15	68	36	29	65
AĞRI	37	6	43	3	4	7
AMASYA	22	2	24	20	2	22
ANKARA	172	100	272	100	21	121
ANTALYA	136	84	220	159	79	238
ARTVİN	13	10	23	8	0	8
AYDIN	57	20	77	100	108	208
BALIKESİR	113	52	165	122	60	182
BİLECİK	12	4	16	11	0	11
BİNGÖL	1	1	2	5	2	7
BİTLİS	5	1	6	3	0	3
BOLU	23	6	29	28	4	32
BURDUR	20	18	38	23	13	36
BURSA	105	53	158	96	89	185
ÇANAKKALE	28	12	40	35	2	37
ÇANKIRI	14	3	17	18	0	18
ÇORUM	12	2	14	16	3	19
DENİZLİ	65	20	85	62	64	126
DIYARBAKIR	28	7	35	14	5	19
EDİRNE	22	10	32	14	2	16
ELAZIĞ	18	2	20	30	3	33
ERZİNCAN	16	9	25	17	6	23
ERZURUM	19	4	23	18	0	18
ESKİŞEHİR	16	8	24	25	1	26
GAZİANTEP	34	4	38	31	0	31
GİRESUN	33	3	36	36	10	46
GÜMÜŞHANE	4	0	4	4	1	5
HAKKARİ	6	0	6	0	0	0
HATAY	78	20	98	55	18	73
ISPARTA	20	4	24	19	8	27
İÇEL	117	13	130	66	11	77
İSTANBUL	142	103	245	236	164	400
İZMİR	77	24	101	136	60	196
KARS	12	2	14	7	3	10
KASTAMONU	22	0	22	32	4	36
KAYSERİ	33	6	39	53	16	69
KIRKLARELİ	28	6	34	22	10	32
KİRŞEHİR	16	18	34	10	10	20

APPENDIX Y. (cont`d)

CITIES	2000			2001		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	30	13	43	59	61	120
KONYA	61	14	75	41	9	50
KÜTAHYA	28	4	32	28	0	28
MALATYA	20	4	24	23	7	30
MANİSA	79	11	90	65	7	72
K.MARAŞ	21	1	22	25	2	27
MARDİN	14	2	16	4	2	6
MUĞLA	104	53	157	130	155	285
MUŞ	9	1	10	3	1	4
NEVŞEHİR	13	4	17	19	1	20
NİĞDE	32	5	37	9	10	19
ORDU	39	8	47	45	11	56
RİZE	14	3	17	20	3	23
SAKARYA	44	36	80	79	55	134
SAMSUN	39	4	43	46	2	48
SİİRT	10	0	10	3	0	3
SİNOP	16	2	18	26	3	29
SİVAS	12	5	17	20	11	31
TEKİRDAĞ	59	30	89	49	9	58
TOKAT	46	1	47	7	3	10
TRABZON	43	6	49	68	10	78
TUNCELİ	2	1	3	4	0	4
ŞANLIURFA	20	2	22	16	5	21
UŞAK	26	3	29	23	1	24
VAN	5	1	6	7	3	10
YOZGAT	29	14	43	19	5	24
ZONGULDAK	21	2	23	25	5	30
AKSARAY	18	3	21	13	0	13
BAYBURT	2	1	3	0	0	0
KARAMAN	13	4	17	13	4	17
KIRIKKALE	19	7	26	21	6	27
BATMAN	23	2	25	1	0	1
ŞİRNAK	5	0	5	6	1	7
BARTIN	9	2	11	14	3	17
ARDAHAN	11	2	13	4	1	5
İĞDIR	7	1	8	2	0	2
YALOVA	11	0	11	26	2	28
KARABÜK	10	3	13	14	5	19
KİLİS	1	1	2	7	0	7
OSMANİYE	17	4	21	15	3	18
DÜZCE	32	3	35	22	4	26

APPENDIX Z. Number of Crimes in Gendarmerie Area in 2000

CITIES	CRIMES AGAINST PROPERTY			CRIMES AGAINST PERSONS		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	199	138	337	562	20	582
ADYAMAN	34	11	45	172	2	174
AFYON	116	41	157	310	3	313
AĞRI	37	8	45	189	3	192
AMASYA	35	4	39	142	2	144
ANKARA	299	208	507	529	12	541
ANTALYA	175	117	292	679	48	727
ARTVİN	23	22	45	58	2	60
AYDIN	114	44	158	269	4	273
BALIKESİR	237	127	364	501	12	513
BİLECİK	19	4	23	70	0	70
BİNGÖL	1	1	2	93	2	95
BİTLİS	17	2	19	72	0	72
BOLU	35	11	46	119	0	119
BURDUR	47	44	91	148	1	149
BURSA	178	85	263	368	10	378
ÇANAKKALE	45	20	65	127	0	127
ÇANKIRI	29	7	36	101	0	101
ÇORUM	31	4	35	124	0	124
DENİZLİ	166	49	215	498	8	506
DİYARBAKIR	86	23	109	263	4	267
EDİRNE	26	11	37	108	0	108
ELAZIĞ	38	4	42	188	2	190
ERZİNCAN	30	17	47	128	1	129
ERZURUM	58	12	70	313	1	314
ESKİŞEHİR	34	13	47	157	1	158
GAZİANTEP	72	8	80	171	6	177
GİRESUN	65	6	71	143	0	143
GÜMÜŞHANE	13	0	13	57	0	57
HAKKARİ	8	0	8	35	3	38
HATAY	103	32	135	301	4	305
ISPARTA	33	13	46	166	2	168
İÇEL	172	15	187	524	6	530
İSTANBUL	303	231	534	469	27	496
İZMİR	184	64	248	391	7	398
KARS	56	12	68	260	0	260
KASTAMONU	58	0	58	237	0	237
KAYSERİ	55	15	70	276	5	281
KIRKLARELİ	46	7	53	212	1	213
KİRŞEHİR	23	30	53	160	1	161

APPENDIX Z. (cont`d)

CITIES	CRIMES AGAINST PROPERTY			CRIMES AGAINST PERSONS		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	68	32	100	133	12	145
KONYA	151	32	183	544	4	548
KÜTAHYA	61	8	69	263	3	266
MALATYA	63	15	78	169	5	174
MANİSA	178	27	205	507	3	510
K.MARAŞ	49	2	51	309	1	310
MARDİN	27	3	30	130	2	132
MUĞLA	164	84	248	416	4	420
MUŞ	13	3	16	194	6	200
NEVŞEHİR	24	7	31	178	1	179
NİĞDE	51	9	60	138	1	139
ORDU	89	16	105	311	1	312
RİZE	22	7	29	71	0	71
SAKARYA	105	85	190	278	15	293
SAMSUN	113	8	121	338	1	339
SİİRT	11	0	11	64	1	65
SİNOP	41	5	46	112	1	113
SİVAS	35	15	50	253	2	255
TEKİRDAĞ	90	47	137	237	6	243
TOKAT	46	3	49	208	0	208
TRABZON	69	8	77	245	2	247
TUNCELİ	10	4	14	33	0	33
ŞANLIURFA	64	7	71	212	1	213
UŞAK	55	11	66	209	1	210
VAN	45	6	51	97	4	101
YOZGAT	75	30	105	257	4	261
ZONGULDA	54	2	56	209	1	210
AKSARAY	34	7	41	164	0	164
BAYBURT	3	1	4	29	1	30
KARAMAN	22	8	30	97	0	97
KIRIKKALE	60	27	87	106	0	106
BATMAN	31	3	34	79	0	79
ŞIRNAK	14	0	14	45	0	45
BARTIN	28	4	32	122	2	124
ARDAHAN	50	5	55	200	0	200
İĞDIR	19	2	21	114	0	114
YALOVA	17	1	18	52	1	53
KARABÜK	17	5	22	103	1	104
KİLİS	8	3	11	29	2	31
OSMANİYE	32	8	40	123	0	123
DÜZCE	60	6	66	228	0	228

APPENDIX AA. Number of Crimes in Gendarmerie Area in 2001

CITIES	CRIMES AGAINST PROPERTY			CRIMES AGAINST PERSONS		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
ADANA	148	46	194	275	13	288
ADYAMAN	27	9	36	100	1	101
AFYON	93	37	130	212	1	213
AĞRI	16	7	23	77	3	80
AMASYA	48	3	51	79	0	79
ANKARA	282	38	320	283	1	284
ANTALYA	294	96	390	376	10	386
ARTVİN	23	0	23	32	0	32
AYDIN	186	136	322	218	3	221
BALIKESİR	274	68	342	325	4	329
BİLECİK	31	1	32	32	1	33
BİNGÖL	17	3	20	48	0	48
BİTLİS	41	2	43	26	0	26
BOLU	57	7	64	74	1	75
BURDUR	65	38	103	43	0	43
BURSA	187	106	293	298	9	307
ÇANAKKALE	95	3	98	86	1	87
ÇANKIRI	40	0	40	38	0	38
ÇORUM	56	6	62	109	0	109
DENİZLİ	150	83	233	293	6	299
DİYARBAKIR	61	8	69	114	3	117
EDİRNE	40	2	42	62	0	62
ELAZIĞ	75	3	78	64	1	65
ERZİNCAN	102	8	110	56	0	56
ERZURUM	62	2	64	129	2	131
ESKİŞEHİR	48	5	53	73	0	73
GAZİANTEP	77	8	85	110	2	112
GİRESUN	79	12	91	90	0	90
GÜMÜŞHANE	10	2	12	36	0	36
HAKKARİ	6	0	6	15	2	17
HATAY	122	31	153	156	2	158
ISPARTA	98	12	110	109	0	109
İÇEL	137	19	156	226	8	234
İSTANBUL	400	225	625	452	37	489
İZMİR	247	86	333	339	6	345
KARS	43	9	52	151	0	151
KASTAMONU	65	4	69	135	0	135
KAYSERİ	140	20	160	182	0	182
KIRKLARELİ	88	16	104	85	0	85
KIRŞEHİR	52	19	71	49	0	49

APPENDIX AA. (cont`d)

CITIES	CRIMES AGAINST PROPERTY			CRIMES AGAINST PERSONS		
	CLEARED	NOT CLEARED	TOTAL	CLEARED	NOT CLEARED	TOTAL
KOCAELİ	91	72	163	149	6	155
KONYA	110	25	135	298	7	305
KÜTAHYA	45	0	45	124	1	125
MALATYA	66	15	81	125	3	128
MANİSA	135	10	145	306	2	308
K.MARAŞ	115	2	117	222	0	222
MARDİN	20	4	24	74	3	77
MUĞLA	240	185	425	290	2	292
MUŞ	27	2	29	73	2	75
NEVŞEHİR	30	6	36	72	1	73
NİĞDE	27	18	45	74	1	75
ORDU	80	15	95	175	0	175
RİZE	46	3	49	43	1	44
SAKARYA	135	56	191	192	4	196
SAMSUN	117	2	119	253	2	255
SİİRT	11	0	11	32	0	32
SİNOP	52	1	53	60	2	62
SİVAS	60	19	79	93	3	96
TEKİRDAĞ	115	8	123	101	6	107
TOKAT	26	12	38	144	1	145
TRABZON	90	10	100	101	0	101
TUNCELİ	27	0	27	25	0	25
ŞANLIURFA	39	11	50	105	1	106
UŞAK	54	1	55	81	1	82
VAN	52	5	57	90	3	93
YOZGAT	63	10	73	119	4	123
ZONGULDAK	45	7	52	162	2	164
AKSARAY	26	5	31	86	0	86
BAYBURT	19	0	19	7	0	7
KARAMAN	21	8	29	47	0	47
KIRIKKALE	51	12	63	59	1	60
BATMAN	10	1	11	40	0	40
ŞIRNAK	20	2	22	24	3	27
BARTIN	22	3	25	109	2	111
ARDAHAN	30	1	31	54	0	54
İĞDIR	17	1	18	39	1	40
YALOVA	37	2	39	35	0	35
KARABÜK	25	8	33	29	0	29
KİLİS	10	0	10	17	0	17
OSMANİYE	40	8	48	65	1	66
DÜZCE	59	3	62	96	2	98

**APPENDIX AB. Number of Thefts In Three Big Cities and
Yenimahalle Neighbourhood**

PERIOD	MONTHS	ISTANBUL	ANKARA	IZMIR	YENIMAHALLE
1	January 2000	3755	528	685	
2	February 2000	3642	605	685	
3	March 2000	3866	590	558	
4	April 2000	3607	503	650	
5	May..2000	3442	493	550	
6	June 2000	3268	511	501	
7	July 2000	2881	516	460	
8	August 2000	3385	668	469	
9	September 2000	3016	553	479	
10	October 2000	3177	641	574	
11	November 2000	3373	524	490	
12	December 2000	4032	623	602	
13	January 2001	5347	803	722	115
14	February 2001	6058	857	569	124
15	March 2001	6064	917	686	145
16	April 2001	5841	761	636	128
17	May..2001	5896	890	606	159
18	June 2001	5007	698	576	170
19	July 2001	4211	852	556	111
20	August 2001	3480	787	633	158
21	September 2001	3977	805	521	135
22	October 2001	4103	1021	626	196
23	November 2001	4105	1030	577	184
24	December 2001	4246	1193	678	210
25	January 2002	4100	878	794	123
26	February 2002	3961	898	593	94
27	March 2002	4063	1002	732	107
28	April 2002	3932	875	690	100
29	May..2002	4301	881	618	122
30	June 2002	3274	654	559	111
31	July 2002	3322	823	553	163
32	August 2002	3308	937	590	176
33	September 2002	3398	840	545	136
34	October 2002	3784	1084	616	189
35	November 2002	3452	917	647	177
36	December 2002	3867	998	799	179
37	January 2003	4235	1211	945	
38	February 2003	3678	909	839	
39	March 2003	4301	1187	1112	
40	April 2003	4105	1177	938	
41	May..2003	6821	1118	1074	
42	June 2003	4272	1023	1106	
43	July 2003	5311	1013	899	
44	August 2003	4835	856	950	
45	September 2003	4672	868	924	
46	October 2003	4669	934	882	
47	November 2003	4170	944	1317	
48	December 2003	4710	1136	1177	
49	January 2003	5284	1421	1366	
50	February2004	5318	1275	1223	
51	March 2004	6211	1352	1278	
52	April 2004	6132	1257	1110	
53	May..2004	6313	1512	1127	

APPENDIX AC.Spreadsheet of Holt-Winter`s Method for
Thefts In Istanbul

PERIOD	MONTHS	ACTUAL THEFTS	BASE LEVEL	TREND	SEASONAL FACTOR	PREDICTE D THEFTS
1	January 2000	3755			1,087	
2	February 2000	3642			1,055	
3	March 2000	3866			1,119	
4	April 2000	3607			1,044	
5	May..2000	3442			0,997	
6	June 2000	3268			0,946	
7	July 2000	2881			0,834	
8	August 2000	3385			0,980	
9	September 2000	3016			0,873	
10	October 2000	3177			0,920	
11	November 2000	3373			0,977	
12	December 2000	4032	3453,7	0,0	1,167	
13	January 2001	5347	4057,6	0,0	1,207	3755,0
14	February 2001	6058	4753,5	0,0	1,169	4278,9
15	March 2001	6064	5027,3	0,0	1,165	5321,0
16	April 2001	5841	5260,5	0,0	1,079	5250,5
17	May..2001	5896	5530,9	0,0	1,033	5242,7
18	June 2001	5007	5432,1	0,0	0,934	5233,5
19	July 2001	4211	5273,7	0,0	0,816	4531,4
20	August 2001	3480	4563,0	0,0	0,867	5168,8
21	September 2001	3977	4559,3	0,0	0,873	3984,7
22	October 2001	4103	4518,5	0,0	0,914	4194,1
23	November 2001	4105	4388,4	0,0	0,955	4412,9
24	December 2001	4246	4044,8	0,0	1,106	5123,3
25	January 2002	4100	3887,2	0,0	1,128	4882,1
26	February 2002	3961	3848,2	0,0	1,096	4543,3
27	March 2002	4063	3942,5	0,0	1,095	4481,2
28	April 2002	3932	4030,3	0,0	1,025	4252,6
29	May..2002	4301	4494,6	0,0	0,993	4162,0
30	June 2002	3274	4018,5	0,0	0,872	4195,7
31	July 2002	3322	3930,1	0,0	0,831	3277,7
32	August 2002	3308	3792,3	0,0	0,870	3407,9
33	September 2002	3398	3663,2	0,0	0,901	3309,8
34	October 2002	3784	3489,1	0,0	1,002	3347,2
35	November 2002	3452	3540,6	0,0	0,965	3332,9
36	December 2002	3867	3522,0	0,0	1,102	3916,9
37	January 2003	4235	3618,0	0,0	1,150	3972,4
38	February 2003	3678	3509,4	0,0	1,071	3966,5
39	March 2003	4301	3682,2	0,0	1,133	3842,6
40	April 2003	4105	3815,1	0,0	1,052	3774,7
41	May..2003	6821	5073,9	0,0	1,176	3789,6
42	June 2003	4272	5002,3	0,0	0,863	4423,4
43	July 2003	5311	5575,0	0,0	0,894	4157,1
44	August 2003	4835	5568,3	0,0	0,869	4849,2
45	September 2003	4672	5409,7	0,0	0,882	5018,4
46	October 2003	4669	5099,4	0,0	0,957	5423,0
47	November 2003	4170	4777,5	0,0	0,917	4923,5
48	December 2003	4710	4569,9	0,0	1,065	5264,7
49	January 2003	5284	4580,1	0,0	1,152	5255,7
50	February2004	5318	4738,6	0,0	1,098	4906,3
51	March 2004	6211	5045,3	0,0	1,184	5368,5
52	April 2004	6132	5369,6	0,0	1,099	5305,5
53	May..2004	6313	5369,6	0,0	1,176	6313,0

APPENDIX AD.Spreadsheet of Holt-Winter`s Method for Thefts In
Ankara

PERIOD	MONTHS	ACTUAL THEFTS	BASE LEVEL	TREND	SEASONAL FACTOR	PREDICTE D THEFTS
1	January 2000	528			0,938	
2	February 2000	605			1,075	
3	March 2000	590			1,048	
4	April 2000	503			0,894	
5	May..2000	493			0,876	
6	June 2000	511			0,908	
7	July 2000	516			0,917	
8	August 2000	668			1,187	
9	September 2000	553			0,982	
10	October 2000	641			1,139	
11	November 2000	524			0,931	
12	December 2000	623	562,9	0,0	1,107	
13	January 2001	803	791,7	0,8	1,004	528,0
14	February 2001	857	796,3	0,8	1,076	851,8
15	March 2001	917	857,8	1,0	1,066	835,5
16	April 2001	761	853,2	1,0	0,892	767,4
17	May..2001	890	980,6	1,4	0,903	748,1
18	June 2001	698	815,7	0,9	0,863	891,5
19	July 2001	852	904,7	1,2	0,938	748,5
20	August 2001	787	716,5	0,5	1,110	1075,0
21	September 2001	805	796,9	0,8	1,006	704,4
22	October 2001	1021	874,9	1,1	1,163	908,4
23	November 2001	1030	1055,9	1,7	0,970	815,4
24	December 2001	1193	1040,5	1,6	1,141	1170,4
25	January 2002	878	882,6	1,1	0,996	1046,4
26	February 2002	898	978,3	1,4	0,939	950,8
27	March 2002	1002	1108,0	1,8	0,926	1044,6
28	April 2002	875	995,9	1,4	0,880	990,1
29	May..2002	881	969,1	1,4	0,908	901,0
30	June 2002	654	643,2	0,2	0,996	837,1
31	July 2002	823	795,1	0,7	1,022	603,8
32	August 2002	937	816,9	0,8	1,142	883,5
33	September 2002	840	883,8	1,0	0,958	823,0
34	October 2002	1084	958,7	1,3	1,135	1029,3
35	November 2002	917	948,9	1,3	0,967	930,7
36	December 2002	998	891,1	1,1	1,123	1084,4
37	January 2003	1211	1144,7	1,9	1,050	888,6
38	February 2003	909	1007,3	1,5	0,907	1076,7
39	March 2003	1187	1222,0	2,2	0,965	934,0
40	April 2003	1177	1312,2	2,5	0,895	1077,7
41	May..2003	1118	1249,2	2,3	0,897	1194,2
42	June 2003	1023	1076,2	1,7	0,957	1246,8
43	July 2003	1013	1010,1	1,4	1,005	1101,8
44	August 2003	856	807,0	0,7	1,072	1155,2
45	September 2003	868	884,5	1,0	0,978	773,7
46	October 2003	934	836,6	0,8	1,119	1005,1
47	November 2003	944	945,9	1,2	0,994	809,6
48	December 2003	1136	997,6	1,4	1,137	1063,4
49	January 2003	1421	1275,9	2,3	1,105	1048,5
50	February2004	1275	1377,4	2,7	0,923	1159,7
51	March 2004	1352	1396,1	2,7	0,968	1332,2
52	April 2004	1257	1403,5	2,7	0,895	1251,6
53	May..2004	1512	1624,7	3,5	0,926	1261,0

APPENDIX AE.Spreadsheet of Holt-Winter`s Method for Thefts In
Izmir

PERIOD	MONTHS	ACTUAL THEFTS	BASE LEVEL	TREND	SEASONAL FACTOR	PREDICTED THEFTS
1	January 2000	685			1,226	
2	February 2000	685			1,226	
3	March 2000	558			0,999	
4	April 2000	650			1,164	
5	May..2000	550			0,985	
6	June 2000	501			0,897	
7	July 2000	460			0,824	
8	August 2000	469			0,840	
9	September 2000	479			0,858	
10	October 2000	574			1,028	
11	November 2000	490			0,877	
12	December 2000	602	558,6	0,0	1,078	
13	January 2001	722	569,0	0,0	1,243	685,0
14	February 2001	569	532,8	0,0	1,163	697,8
15	March 2001	686	585,9	0,0	1,067	532,2
16	April 2001	636	572,3	0,0	1,143	681,8
17	May..2001	606	587,2	0,0	1,003	563,5
18	June 2001	576	606,2	0,0	0,918	526,7
19	July 2001	556	630,0	0,0	0,847	499,2
20	August 2001	633	672,7	0,0	0,880	528,9
21	September 2001	521	650,2	0,0	0,835	576,9
22	October 2001	626	636,1	0,0	1,010	668,2
23	November 2001	577	643,6	0,0	0,885	558,0
24	December 2001	678	563,4	0,0	1,128	693,6
25	January 2002	794	643,3	0,0	1,240	700,5
26	February 2002	593	597,2	0,0	1,096	748,4
27	March 2002	732	647,6	0,0	1,092	637,3
28	April 2002	690	689,6	0,0	1,086	740,1
29	May..2002	618	710,6	0,0	0,950	692,0
30	June 2002	559	695,1	0,0	0,873	652,4
31	July 2002	553	677,8	0,0	0,835	588,8
32	August 2002	590	642,1	0,0	0,895	596,4
33	September 2002	545	634,9	0,0	0,844	536,2
34	October 2002	616	613,1	0,0	1,008	641,5
35	November 2002	647	653,8	0,0	0,926	542,5
36	December 2002	799	672,7	0,0	1,151	737,2
37	January 2003	945	703,6	0,0	1,281	833,9
38	February 2003	839	725,0	0,0	1,120	771,0
39	March 2003	1112	826,1	0,0	1,193	791,9
40	April 2003	938	839,0	0,0	1,099	897,5
41	May..2003	1074	939,4	0,0	1,027	797,3
42	June 2003	1106	1052,5	0,0	0,944	820,0
43	July 2003	899	1061,0	0,0	0,840	878,4
44	August 2003	950	1061,0	0,0	0,895	950,0
45	September 2003	924	1072,5	0,0	0,851	895,9
46	October 2003	882	1004,3	0,0	0,957	1081,3
47	November 2003	1317	1148,3	0,0	1,014	930,5
48	December 2003	1177	1104,8	0,0	1,117	1322,2
49	January 2003	1366	1091,6	0,0	1,269	1415,0
50	February2004	1223	1091,7	0,0	1,120	1222,8
51	March 2004	1278	1084,6	0,0	1,187	1302,5
52	April 2004	1110	1058,9	0,0	1,079	1192,0
53	May..2004	1127	1072,2	0,0	1,037	1087,5

APPENDIX AF.Spreadsheet of Holt-Winter`s Method for
Thefts In Yenimahalle

PERIOD	MONTHS	ACTUAL THEFTS	BASE LEVEL	TREND	SEASONAL FACTOR	PREDICTED THEFTS
1	November 2000	115			0,752	
2	December 2000	124			0,811	
3	January 2001	145			0,948	
4	February 2001	128			0,837	
5	March 2001	159			1,040	
6	April 2001	170			1,112	
7	May..2001	111			0,726	
8	June 2001	158			1,033	
9	July 2001	135			0,883	
10	August 2001	196			1,282	
11	September 2001	184			1,203	
12	October 2001	210	152,9	0,0	1,373	
13	November 2001	123	158,6	0,2	0,776	115,0
14	December 2001	94	135,9	-0,7	0,692	128,8
15	January 2002	107	123,3	-1,2	0,868	128,2
16	February 2002	100	120,7	-1,2	0,829	102,2
17	March 2002	122	118,3	-1,3	1,031	124,2
18	April 2002	111	107,9	-1,6	1,029	130,2
19	May..2002	163	169,5	0,9	0,962	77,1
20	June 2002	176	170,3	0,9	1,033	176,0
21	July 2002	136	162,0	0,5	0,839	151,2
22	August 2002	189	154,5	0,2	1,223	208,4
23	September 2002	177	150,6	0,0	1,175	186,1
24	October 2002	179	139,8	-0,4	1,280	206,9