Cheating in Retail Illicit Drug Transactions: Theory and Evidence

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Abstract

The reliability of illicit drug markets has important implications for any proposed legalization or decriminalization of illicit drugs. The level of violence and cheating in the illicit drugs market will define the magnitude of the social benefits from the legalization and regulation of the illicit market. The reliability of the illicit drugs market also has important implications for any decriminalisation of drugs. A common criticism of decriminalisation is it leaves a 'harmful' illicit market intact (see Drug Policy Forum Trust, 1998). If the illicit market is actually relatively reliable, policy makers are able to respond to any public demand for lighter penalties for drug use without any major concern about the role the illicit market plays in violence and crime.

This thesis uses property rights economics to model the level of cheating between exchange parties in retail illicit drug transactions. Illicit drug transactions are generally assumed to be unreliable because exchange parties cannot call on the police and courts to enforce the terms of transactions. The reliability of illicit drug transactions is essentially a problem of social cooperation in the absence of third party enforcement. The scope of the model is restricted to exchange parties during retail drug transactions. It does not explain all the cheating and violence which might occur in an illicit drugs market. The model therefore can only partially address the drug control policy issues related to the reliability of illicit drug markets.

The decision to cheat on a retail illicit drug transaction is initially modelled as a two person prisoners dilemma game. The "ongoing interaction" solution to the prisoners dilemma is adapted to retail illicit drug transactions by introducing search costs. The decision to cheat involves comparing the expected one-off benefit of cheating with the search costs of locating a new exchange partner. The one-off benefit of cheating is

constrained by the low financial value of retail drug transactions. Search costs are high in the illicit drugs market because exchange parties are secretive and suspicious, there is no advertising, information directories, or prominent store locations, to assist exchange parties with finding exchange partners, and search activity can result in arrest and victimisation. The model indicates there are often strong incentives to voluntarily honour the terms of retail illicit drug transactions.

Search costs also make it costly for victims of cheating to quit exchange relationships. The decision to quit an exchange relationship involves comparing the search costs of finding a new exchange partner with the losses from continuing to transact with an existing cheating exchange partner. It will usually pay to quit an exchange relationship after cheating because the perpetuity of losses from cheating will generally be greater than the search costs of finding a new exchange partner. However, if the costs of cheating are very small, for example in the case of quality fraud, it maybe rational to persist with a cheating exchange partner - at least in the short term.

The assertions of the model are tested in the retail cannabis market in New Zealand. The central assertions are product fraud, robbery, and assault, will be rare, while quality fraud will be relatively common. Sellers will not cheat buyers because transactions are very profitable, reputation is important, new customers are costly to find, and sellers wish to dispose of stocks of drugs as quickly as possible. Data collected in a postal questionnaire of members of the Aotearoa Legalise Cannabis Party (ALCP) was broadly consistent with the model's assertions (n = 357). A range of statistical analysis was used to test the model's assertions.

Most buyers (78.5%) had never suffered from product fraud. The overwhelming majority of buyers (91-96%) had never been robbed or assaulted. The overwhelming

majority of buyers (85-98%) experienced product fraud, robbery, and assault, less than 0.1 times per 100 transactions (less than 1 incident in 1000 transactions). In contrast, 81% of buyers had suffered from quality fraud. Many buyers (41%) experienced quality fraud more than 5 times per 100 transactions.

Overall, the average level of cheating (per 100 people) in the ALCP sample was higher than the average level of cheating (per 100 people) in New Zealand as a whole. The important exception was the incidence of assault. There were one-third less assaults (per 100 people) in the ALCP sample than in New Zealand as a whole. The level of robbery (per 100 people) in the ALCP sample was comparable to the level of robbery in New Zealand as a whole. In contrast, there were approximately 100 times more incidents of quality fraud (per 100 people) in the ALCP sample than New Zealand as a whole.

The highly positively skewed nature of the data (ie. many people never been cheated) meant the median provided a better description of the sample than the mean. A large proportion of buyers (79-96%) had levels of product fraud, robbery, and assault (per 100 people) below the levels of these offences for New Zealand as a whole. Only a very small proportion of buyers (2-16%) had levels of product fraud, robbery, and assault, above the range of these offences (per 100 people) for New Zealand. In contrast, a large proportion of buyers (79%) had levels of quality fraud (per 100 people) above the level of fraud (per 100 people) for New Zealand as a whole.

Sellers were provided with eight reasons why they did not cheat buyers and asked to score the importance of each using the scale, 1 ("not important") to 7 ("very important"). Four of the reasons were from the model and were based on the profit motive and the need to minimise search costs. They were, "money," "selling stocks

quickly," "reputation," and "limited customers." The other four reasons were traditional explanations for reliable illicit drug exchange based on fear of physical retaliation and the desire to minimise the risk of arrest. They were, "fear of physical retaliation," "fear of attracting the police," "fear of betrayal to the police," and "cheating may result in committing a more serious crime."

Between 61-65% of sellers thought the four reasons used in the model were very important reasons not to cheat buyers (ie. importance score of 6-7). In contrast, only between 33-44% of sellers thought the four traditional reasons were very important (ie. importance score of 6-7). When ranked according to average score of importance the four reasons used in the model were all higher than the traditional reasons. The reasons used in the model occupied the first four rankings, "money" (5.5), "selling stocks" (5.4), "reputation" (5.3), and "limited customers" (5.1). "Fear of physical retaliation" received the lowest average score of importance of the eight reasons provided (3.8). The other three traditional reasons also received relatively low average scores of importance, "fear of betrayal to police" (3.9), "fear of attracting the police" (4.2), and "cheating may result in committing a more serious crime" (4.4).

The policy implications that can be drawn from the thesis are extremely tentative. Additional modelling of the illicit drugs market and a greater understanding of the wider consequences of liberalising drug control laws is required before firm policy recommendations can be made. The model and research completed in this thesis suggest the legalization and regulation of the cannabis market will only have a small impact on lowering violence and cheating in New Zealand. The only significant impact the legalization of cannabis would have on levels of victimisation would be to reduce quality fraud. The results from the thesis could be used to support the case for the decriminalisation of cannabis in New Zealand. The thesis suggests the illicit cannabis

market does not contribute significantly to violence and victimisation in New Zealand. Decriminalisation could be used to meet any public demand for the reduction in the legal penalties for cannabis use without any major concern about leaving a dangerous illicit market intact.

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1. Introduction

1.1 Background

In recent years a number of writers have used benefit-cost analysis to support their views on drug control policy.[1] An economic approach to drug control policy is timely given the increasing amounts of public money now spent on drug enforcement, and the need to move beyond the ideological stalemate which has characterised the debate for sometime.

One of the social benefits often discussed from the legalization of drugs is the elimination of the violence related to the unregulated illegal market. Currently drug users and drug dealers are physically harmed and killed during drug transactions, have money and property stolen, and sometimes suffer health problems, and even death, from consuming unsafe drugs. The wider community is affected by the anarchy of illicit drug markets through higher levels of street crime, and the additional health care costs of cheated drug users.

The level of cheating in an illicit drug market defines the magnitude of the social benefits from legalizing and regulating the market. Official statistics on crime and violence are not comprehensive enough to calculate the level of violence and cheating in an illicit drugs market. Consequently, the reliability of illicit drug markets is an excellent topic for economic modelling and original market research. This thesis seeks to model the level of cheating between exchange parties in retail illicit drug transactions.

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[1] see Friedman, 1972; Nadelmann, 1989; Ostrowski, 1990; 1991; Dennis, 1990; Kielman and Saiger, 1990; Miron and Zweibel, 1995; Kaplan, 1988; Wilson, 1990; Inciardi and Saum, 1996.

The origins of this thesis lie in the early property rights literature on the development of property rights (see Demsetz, 1967; Anderson and Hill, 1975; 1979; Posner, 1980; Umbeck, 1981). An interesting feature of this early work was groups of private individuals were often able to develop and maintain property right structures without a formal government or formal enforcement agency. Even when the gains from using violence appeared to be persuasive, such as in a mining settlement in the Wild West, individuals were still able to achieve peaceful and stable rights arrangements (see Umbeck, 1981; also see, Demestz, 1967, Anderson and Hill, 1979). When economic activity was highly profitable individuals had strong incentives to come to peaceful property rights arrangements. Economizing behaviour was evident even in situations of violent confrontation (Anderson and McChesney, 1994).

The question was could participants in illicit drug markets also maintain some kind of stable informal property rights system. Although the media sometimes reported violent incidents related to illicit drug markets, when the number of these incidents is compared with the number of drug users in a society, or more precisely the total number of drug transactions completed, the level of violence appears relatively low.[2] This thesis aims to improve the theoretical understanding of the role cheating plays in the operation of an illicit drugs market, and empirically measure the level of cheating in an actual market.

The limited scope of the model means it can only partially addresses the drug control policy issues related to the reliability of illicit drug markets. The model does not explain all the cheating and violence which might occur in an illicit drugs market. It only investigates the incentives to cheat faced by exchange parties during retail

[2] Ostrowski (1990) used official statistics to calculate around 825 murders per year in the United States are drug-related. Official drug statistics at the time indicated there were approximately 500,000 heroin

transactions. It does not investigate the incentives to cheat on wholesale transactions. The model does not investigate the violence which may occur between sellers seeking greater market share. It also does not investigate the incentives third parties might have to victimise exchange parties. Finally, it does not address the violence associated with defending stocks of drugs or drug production sites from third parties.

There is also the broader issue of how much violence legalization would eliminate. Opponents of legalization have pointed out the possibility of the survival of an illicit market if taxation and regulation are too strict (Keilman and Saiger, 1990; Jacobs, 1990). Violent criminals may simply find a new illicit industry to operate within. There is also the issue of how the increase in drug consumption following any liberalisation of drug laws would contribute to violence in society (Wilson, 1990; Inciardi and Saum, 1996). Great care is therefore required when applying the results of the thesis to drug control policy. Clearly, additional modelling of the illicit drugs market and a greater understanding of the wider consequences of liberalising drug control laws is required before any firm policy recommendations can be made.

1.2 Chapter Outline of the Thesis

Chapter 2 introduces the topic of cheating in illicit drug markets. It reviews the benefit-cost literature on drug control policy and explains the implications the level of cheating in illicit drug markets has for drug control policy. It also reviews some of the previous studies of violence in illicit markets. Finally, it describes the methodology of the thesis by reviewing the key concepts of the property rights approach.

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users, 3 million cocaine users, and 20 million marijuana users. The size of the drug using population suggests many hundreds of millions of illicit drug transactions must be completed each year.

Chapter 3 reviews the economic theory of cooperation in the absence of third party enforcement. Retail illicit drug transactions are initially modelled as a two person prisoners dilemma game. The chapter goes on to investigate whether recent solutions to the prisoners dilemma game are applicable to the retail illicit drugs market.

Chapter 4 develops a transaction cost model of the reliability of retail illicit drug transactions. The ongoing interaction solution to the prisoners dilemma is adapted to the illicit drugs market by introducing search costs. Two decision making rules are developed to explain all the cheating between exchange parties in retail illicit drug transactions.

Chapter 5 adapts the variables of the model to the illicit cannabis market in New Zealand. A number of testable assertions are developed about the level of cheating between exchange parties in retail cannabis transactions in New Zealand. A research methodology is developed to test these assertions.

Chapter 6 presents the results of the survey of members of the Aotearoa Legalise Cannabis Party (ALCP). The methodology of the survey is explained and discussed. Data collected in the questionnaire is used to test the assertions developed in the previous chapter.

Chapter 7 draws out the conclusions of the thesis and discusses the implications the thesis has for economic theory and drug control policy.

2. The Study of Cheating in Illicit Drug Markets

2.1 Introduction

Interest in the level of cheating in illicit drug markets has emerged from benefit-cost studies of drug control policy. This chapter reviews the benefit-cost literature and explains the implications the level of cheating in illicit drug markets has for drug control policy. It also reviews some of the previous studies of violence in illicit markets. Much of the research that has been completed in this area has been conducted in the United States in the illicit markets for heroin and cocaine. A section on cannabis in New Zealand is included to provide a broader picture of the issues, and to provide a background to the research on the illicit cannabis market in New Zealand presented in subsequent chapters. The last section describes the methodology of the thesis by reviewing some of the key concepts of the property rights approach.

2.2 The Economic Approach to Drug Control Policy

The economic analysis of drug control policy is a relatively new application of economic theory. Traditionally, the control of illicit substances was considered a matter of public morality or public health (see Musto, 1973; Brecher, 1972; Abel, 1980; Thornton, 1991). An individual's view of prohibition was largely determined by their political philosophy. Libertarians naturally objected to state control of private consumption decisions. They promoted the right of individuals to choose to ingest whatever they like free of government moralising. Conservatives, on the other hand, took a more paternalistic view. They argued the government had a responsibility to protect society from the harmful effects of drug use, particularly amongst vulnerable groups such as children, the easily manipulated, and the uninformed. Debate over the

future of drug control policy was often reduced to an ideological stalemate (Warner, 1993).

The nature of the drug control debate began to change in the 1980's. The United States suffered from two new drug "epidemics" during this time, powder cocaine in the early part of the decade, followed by "crack" cocaine in the mid 1980's. The United States government responded by declaring a "war on drugs."[1] Stricter drug control laws were enacted and additional public funds were allocated to drug enforcement (Boaz, 1991; Hamowy, 1987). However, this significant increase in expenditure on drug control appeared to achieve very little. More and more cocaine entered the country, the price of cocaine actually fell, more and more Americans used cocaine, criminals involved in cocaine trafficking became wealthy, and the inner city areas where cocaine was bought and sold became more violent and crime ridden (see Hamowy, 1987).

A number of policy commentators in the United States began to question the practical effectiveness of drug prohibition (see Friedman, 1972; Barnett, 1987; Nadelmann, 1989; Ostrowski, 1990; 1991; Dennis, 1990). These critics made the distinction between the harmful consequences of illicit drugs, and the harmful consequences of the policy of prohibition, or more precisely the harmful consequences of the illicit market for drugs which emerged under prohibition. The unregulated illicit market made drug use a greater health risk, exposed drug users to criminal elements, forced drug

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[1] The cause(s) of the "war on Drugs" in the United States remain controversial. The official federal government explanation is it was a policy developed in response to the cocaine, and later crack, epidemics of the 1980's. Alternative explanations suggest an "opposite causation" where drug dealers responded to successful operations aganinst marijuana in the early 1980's by switching first to cocaine powder and then later to crack (see Thornton, 1991). Benson *et al.* (1995) have advanced another theory where the "war on drugs" was the result of enforcement agencies reacting to asset seizure powers in the Federal Crime Bill 1984. This statute allowed state and local enforcement agencies to retain the proceeds from the asset seizures of drug cases. Benson *et al* (1995) thesis is law enforcement agencies responded by focusing their efforts on drug enforcement as a means of increasing their discretionary budget.

users to commit crimes to support their drug use, lead to the corruption of law enforcement officials, and increased street violence. Wider costs of drug prohibition include the time and money spent of drug enforcement. This includes any extra public funds allocated to drug enforcement as opposed to other public priorities (eg. education), and the diversion of the existing police budget to drug enforcement (see Boaz, 1990). It also includes the diversion of scarce police resources to drug enforcement away from detecting and solving other types of crime (see Benson *et al.*, 1992; Benson and Rasmussen, 1991).

Opponents of drug prohibition claimed the negative aspects of the illicit market actually exceeded the benefits of prohibition in terms of restricting drug use. Once the negative features of the illegal market were removed from drug use, legal drug use could increase significantly and still cause less social harm than under prohibition (Ostrowski, 1990; 1991; Dennis, 1990). Analogies were drawn between drug prohibition and the failure of alcohol prohibition during the 1920's and 1930's (Friedman, 1991; Ostrowski, 1991; Thornton, 1991). The legalization of drugs would eliminate the illicit market, allow the government to regulate and tax the drugs trade, and allow effective rehabilitation and drug education to take place. Opponents of legalization countered the social harm caused by the increase in drug use following legalisation would easily overwhelm the social benefits from eliminating the illicit market (Kielman and Saiger, 1990; Kaplan, 1988; Wilson, 1990; Inciardi and Saum, 1996).

The evaluation of drug prohibition required a comparison of the benefits and costs of prohibition with the benefits and costs of legalization. The discussion of benefits and costs under the two policies increasingly demanded economic analysis (Warner, 1993). An economic analysis provided the means to progress beyond the ideological rhetoric that characterised the debate to now (Warner, 1993). Unfortunately, the value of the

benefit-cost approach was limited by a lack of quantitative data and empirical understanding of important relationships (Warner, 1993; Wagstaff and Maynard, 1988). Drug control policy therefore presents a challenging area for future economic research.

2.3 The Illicit Drugs Market and Violence

2.3.1 Introduction

One of the social benefits from legalizing drugs is the elimination of the violence and crime related to the unregulated illicit drugs market. A range of American writers have provided explanations for why illicit drug markets create violence (see Moore, 1977; Zahn, 1980; Barnett, 1987; Goldstein 1989; Paul and Wilhite, 1994; Miron and Zweibel, 1995). This analysis can be brought together to form a theory of illicit drug markets and violence. This body of work has largely emerged from the analysis of the illicit markets for cocaine and heroin in the United States.

The illegality of the illicit drugs market means exchange parties cannot use the police and courts to enforce the terms of exchange or protect property rights (Miron and Zweibel, 1995; Paul and Wilhite, 1994; Barnett, 1987; Moore, 1977). With no formal institutions to resolve disputes peacefully exchange parties are often forced to resort to violence to enforce their rights. Exchange parties are physically harmed and killed during illicit drug transactions, have money and property stolen, and sometimes suffer health problems, and even death, from consuming unsafe drugs. Members of the public are caught up in violent incidents between exchange parties, endure psychological distress from increasing street crime, and pay for the additional health care costs of cheated drug users (see Wagstaff and Maynard, 1988). The legalization

of drugs would provide exchange parties with access to peaceful ways to resolve disputes, and thereby reduce the levels of violence and crime in society.

Drug users and drug dealers are particularly attractive targets for victimisation (Barnett, 1987). They are known to carry either large amounts of cash or valuable drugs, and must carry out transactions in secluded areas away from the police and public (Barnett, 1987). Drugs are small and valuable, and can be easily re-sold by criminals on the streets (Moore, 1977). Exchange parties cannot report incidents of victimisation to the police (Goldstein, 1989). The risk of cheating and violence is further increased by the youth of the market (ie. 18 year old risk takers), the effects of drug intoxication and drug withdrawal on participants, and the perceived need to carry weapons for protection (Reuter *et al.*, 1990; Goldstein, 1989; Zahn, 1980).

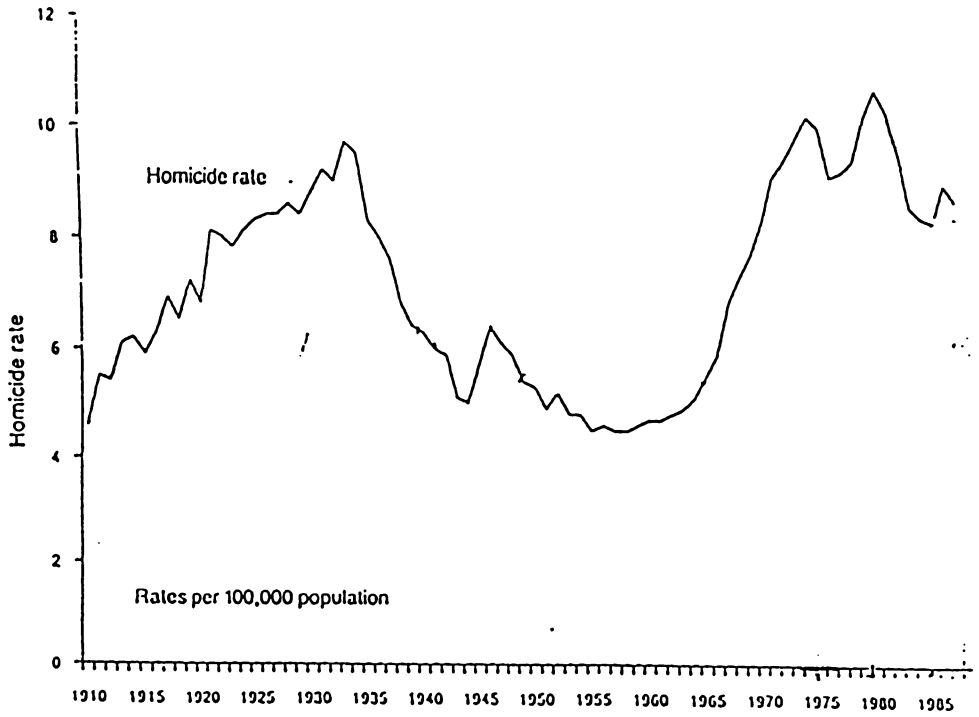
The legal penalties for involvement in the illicit market reduce the cost of violence to participants (Miron and Zweibel, 1995). Evading apprehension for drug offences is complementary with evading apprehension for violence offences (Miron and Zweibel, 1995). Additional legal charges eventually lead to a less-than-proportional increase in legal penalty (Miron and Zweibel, 1995). If the penalties for drug offences are already high, additional violent offences may not significantly increase an offenders sentence. The absence of the police and courts also means there are few peaceful ways to resolve disputes or obtain compensation for cheating. Violence is seemingly the only recourse available to exchange parties.

2.3.2 Illicit Markets and Homicide

A number of American writers have noted the apparent correlation between the existence of illicit markets for alcohol and drugs, and periods of high homicide in the United States (see, Zahn, 1980; Klebba, 1981; Corman *et al.*, 1991; Ostrowski, 1991; Friedman, 1991; Economist, 1991). High rates of homicide have been recorded during alcohol prohibition between 1919 and 1933, after the emergence of heroin from the mid 1960's onwards, after the introduction of powder cocaine in the late 1970's, and again with the introduction of 'crack' cocaine in the mid 1980's.

Milton Friedman (1991) has investigated the relationship between illicit drug markets and homicide trends in the United States. He believes illicit markets for alcohol and drugs have had a significant impact on the homicide rate. Figure 2.1 presents the homicide rate for the United States from 1910-1987.

Figure 2.1: The Homicide Rate (per 100,000 population) in the United States, 1910-1987



Source: Friedman, 1991

Friedman (1991) explains:

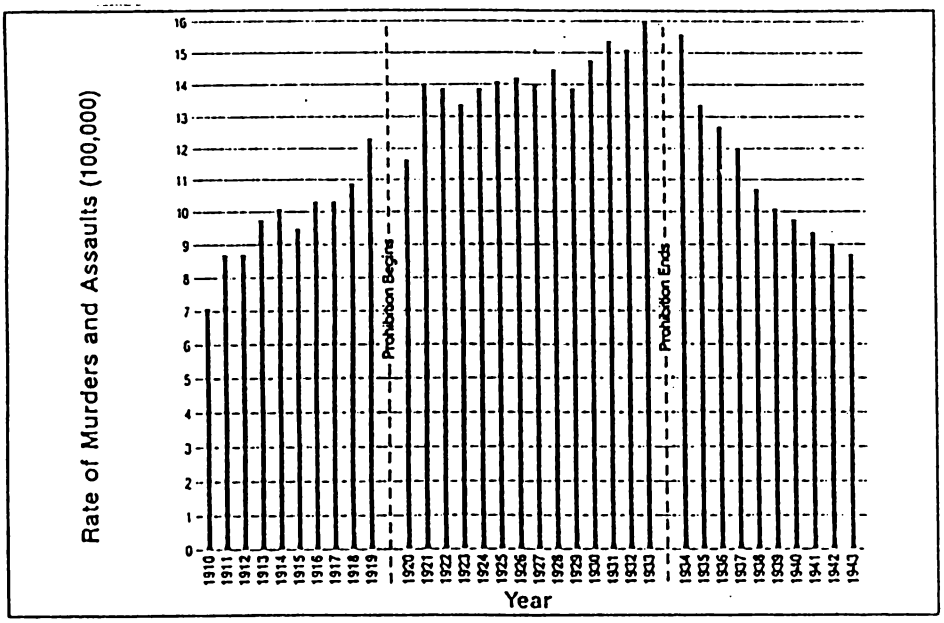
"From 1910 on, there is an almost explosive growth in the number of homicides. The first part of the explosion is World War I.....What happened after the end of the war? The homicide rate kept going up very rapidly and reached a peak precisely the year in which prohibition ended, 1933. It then fell drastically, and stayed down through the forties and fifties.....Since 1933 was also the end of the great contraction, it can be argued the Great Depression was also a stimulus to crime and to homicide. Throughout the prosperous 1920's, however, homicides per hundred thousand persons were very much higher than throughout the prosperous forties and fifties, let alone the late thirties which were not so prosperous." (p. 56-57)

Friedman (1991) recommends the legalisation of drugs as a policy to reduce homicide:

"I believe that no one who looks at the evidence can doubt that ending prohibition had a significant and prompt effect on the homicide rate. Homicides started to go up early in the 1960's and rose very rapidly after Nixon introduced his drug war. More recently, the rate has come down a little, but it is still at the same level as in 1933. I believe one can have great confidence that if drugs were decriminalized the homicide rate would fall sharply, most likely back to the level that it maintained throughout the fifties." (p.57)

James Ostrowski (1991) also believes the legalisation of drugs would significantly reduce violent crime in the United States. He uses crime statistics from the period of alcohol prohibition (1920-1933) to support this view. The combined murder and assault rates in the United States between 1910-1943 are presented in Figure 2.2.

Figure 2.2: Combined per Capita Murder and Assault (by firearm) Rates in the United States, 1910-1943



Source: Ostrowski, 1991

Ostrowski (1991) explains:

"By now, there can be little doubt that most, if not all, "drug-related murders" are the result of drug prohibition. The same type of violence came with the Eighteenth Amendment's ban of alcohol in 1920. The murder rate rose with the start of Prohibition, remained high during Prohibition, and then declined for 11 consecutive years when Prohibition ended. The rate of assaults with a firearm rose with Prohibition and declined for 10 consecutive years after Prohibition. In the last year of Prohibition - 1933 - there were 12,124 homicides and 7,863 assaults with firearms; by 1941 those figures had declined to 8,048 and 4,525, respectively." (p. 45-46)

Margaret Zahn (1980) reviewed the studies of homicide in the United States between 1900-1979. She found homicides between strangers or homicides with an economic motive (sometimes called homicides related to criminal transactions), and the use of firearms, were proportionately higher during the periods of high homicide (ie. late 1920's, and late 1960's). In contrast, homicides involving family members or social acquaintances did not fluctuate dramatically through time, and were the dominant form of homicide in the periods of low homicide rates, such as in the 1950's. She concludes:

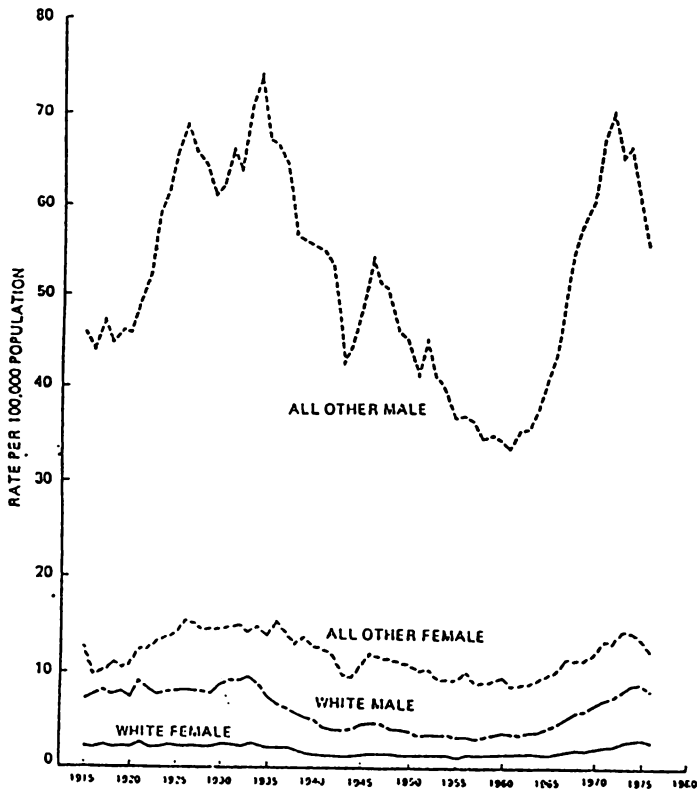
"..this historical review would suggest that closer attention be paid to the connection between markets for illegal goods and the overall rate of homicide violence. It seems possible, if not likely, that establishing and maintaining a market for illegal goods (booze in the 1920's and early 1930s; heroin and cocaine in the late 1960's and early 1970s) may involve controlling and/or reducing the competition, solving disputes between alternate suppliers, or eliminating dissatisfied customers. The resolution of such problems in illegal markets is not easily done by resorting to use of legal sanction (although payoffs may occur). There may, then, be more likelihood of resorting to force to settle differences. This resolution has the added advantage of silencing the victim and thus preventing unwanted information from leaking to official sources.

The use of guns in illegal markets may also be triggered by the constant "fear" of being caught either by a rival or by the police. Such fear may increase the perceived need for protection, that is, a gun, thus may increase the arming of these populations and a resulting increased likelihood of use. For the overall society this may mean a higher homicide rate." (Zahn, 1980, p.128)

Zahn (1980) acknowledges difficulties with the definition of key terms (eg. what is included as homicide, different definitions of offender-victim relationships), as well as bias in the source of homicide data (ie. police versus coroner and medical examiner), make comparisons between studies and through time difficult. Certainly, the homicide data does not specify whether an illicit drug was the motivation for a homicide, or accurately identify the specific role the illicit intoxicant played in the homicide (ie. psychopharmacological, economic compulsive, systematic).

Joan Klebba (1981) examined homicide and suicide trends in the United States between 1900-1976. She challenges the view illicit markets for alcohol and drugs had a significant impact on homicide rates during this time. She argues, although the illicit market for alcohol may account for some of the rise in the homicide rate during the 1920's, other wider socio-economic factors are likely to have been influential, such as the aftermath of World War I, the uneven distribution of the new wealth created during the war years, the economic depression, and the emergence of mass unemployment. She points out, white men, who were most frequently involved in the Prohibition gang wars, continued to have a much lower homicide rate than men of other races who had little involvement in the illicit alcohol trade. Figure 2.3 presents the homicide rate for white men and men of other races in the United States from 1915 to 1976.

Figure 2.3: Homicide Rates, by Color and Sex: United States, 1915-76



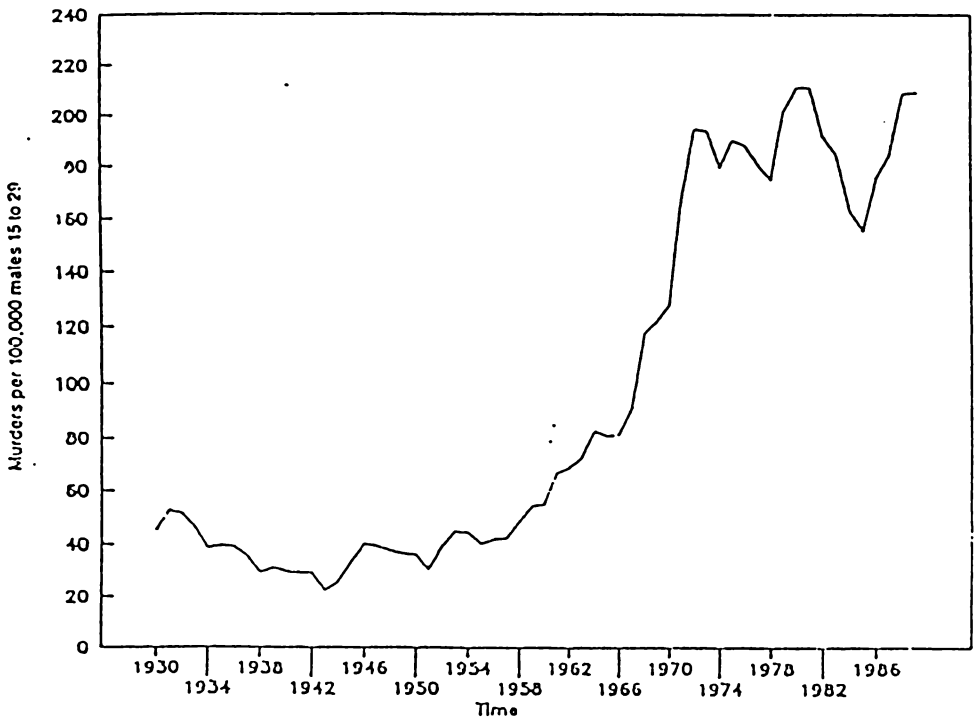
Source: Klebba, 1981

Although the homicide rate for white men is high around the period of alcohol prohibition (1920-1933), the homicide rate for males of other races is also high during Prohibition despite their low involvement in the illicit alcohol trade.

Corman *et al.* (1991) have used a statistical analysis to test whether the introduction of 'crack' cocaine was associated with a statistically significant increase in murders in New York City during the late 1980s. The homicide rate for New York City increased sharply from approximately 1986, which roughly coincides with the introduction of

"crack" cocaine. Figure 2.4 presents the homicide rate in New York City for males aged 15 to 29 between 1930-1989.

Figure 2.4: Number of Murders in New York City (per 100,000) Males Aged 15-29, 1930-1989



Source: Corman *et al.*, 1991

Using the last 23 years of homicide rates for New York City, Corman *et al.* (1991) developed a univariate time-series model up until a hypothetical turning point (ie. the best guess of the introduction of crack). Estimates included, January 1984, July 1984, January 1985, July 1985, and Jan 1986. The series was then projected forward over a 24 month time horizon. If a true turning point occurred at the proposed date, then the forecasts should be poor compared with the actual data. An indication of

poor forecasts would be if the actual data were consistently above the 95-percent confidence interval for forecasts.

Corman *et al.* (1991) found actual murders per month never exceeded the 95-percent confidence interval for forecasts made in January 1985, they exceeded it four times for forecasts made in July 1985, and only three times for forecasts made in January 1986. They concluded:

"We found only a weak evidence of any significant upturn in murders and murder rates. Murders increased from 151 per month in 1980 to 161 per month in 1989, a 6 percent increase in 9 years. The magnitude of the increase in murders is thus far from the "tidal wave" effect depicted in the media [associated with the crack epidemic]....it is the steep drop in murders from 1981 to 1985 that has made the subsequent rise so alarming. One would have had little reason to suspect an intervention in 1985 without the decline in 1981. Perhaps the introduction of crack caused an upturn in murders that otherwise would have continued on its downward path. If the decline in 1981 is part of the inherent variability in murders, however, then crack is a convenient confounder of more fundamental causes." (my explanation, Corman *et al.*, 1991, p.134)

Paul J. Goldstein has undertaken several studies to more precisely document the relationship between drugs and homicide (see, Goldstein *et al.*, 1989; 1992; also Goldstein, 1985; 1991). In one study he analysed homicides committed in 1984 in New York State and New York City (Goldstein *et al.*, 1992). In the New York City sample, 23.8% of the 1,459 homicides (n=347) were classified as drug-related. In the statewide sample, 41.7% of the 309 homicides (n=129) were classified as drug-related. The relatively lower percentage of homicides classified as drug-related in New York City was due to the lack of detail on New York City homicides. As a result most the analysis in the 1984 study is based on the 309 non-New York City homicides.

The 1984 sample indicated the homicide data routinely collected during police investigations was not sufficient for a precise classification of the drug relatedness of homicides. Consequently for his next study Goldstein developed a specific data collection form (Goldstein *et al.*, 1992; 1989). Detectives were asked to fill out a separate questionnaire from their normal casefile reports to identify the precise role drugs played in a homicide. The homicides in this study were all committed in New York City during 1988. Goldstein *et al.* (1992; 1989) found 52.7% of the 414 homicides (n=218) were drug-related. This is likely to be a conservative figure, because even when the police suggested a homicide was "probably drug-related," it was not classified as such until sufficient information was available that both police and researchers believed drugs contributed to the homicide in an "important and causal manner."

In the 1984 sample, most of the drug-related homicides (59%, n=76) were psychopharmacological. In the 1988 sample, most of the drug-related homicides (74%, n=161) were systematic. Very few homicides in both samples were economically compulsive (3% in 1984, n=4, and 4% in 1988, n=9). This does not mean that drug users do not commit crimes to obtain money for drugs, merely that they did not regularly kill victims in the process. The difference in the drug relatedness of homicide between the two samples cannot be easily compared because the two samples differ in terms of time, place (ie. New York City versus non-New York City), data collection procedures (ie. the 1984 data was collected retrospectively using existing police records, the 1988 data was collected using a specially designed data collection which detectives filled out during ongoing investigations), and new developments in the illicit drug marketplace (ie. the introduction of crack cocaine in 1986).

There was significant consistency between the two samples in terms of the drug involved in each type of drug-related homicide. The vast majority of the homicides that were psychopharmacologically induced involved alcohol, a legal drug (95% in 1984, n=72, and 77% in 1988, n=24). Systematic homicides overwhelmingly involved illicit drugs (ie 94% in 1984, n=15, and 100% in 1988, n=162). Table 2.1 breaks down the homicide related to each drug by its drug-relatedness (Goldstein *et al.*, 1989). Ninety-two percent of the cocaine homicides, 85% of the crack homicides, 86% of the marijuana homicides, and 67% of the heroin murders, were classified as systematic.

Table 2.1: Primary Drugs Involved in Drug Related Homicides

	Psycho-pharm	Economic com-pulsive	Systematic	Multi-dimen-sional	Total
Crack	3 (3%)	8 (7%)	100 (85%)	7 (6%)	118
Cocaine	1 (2)	0	44 (92)	3 (6)	48
Alcohol	21 (100)	0	0	0	21
Marijuana	1 (14)	0	6 (86)	0	7
Heroin	0	0	2 (67)	1 (33)	3
Cocaine/crack	0	0	4 (80)	1 (20)	5
Cocaine/alcohol	2 (67)	0	0	1 (33)	3
Cocaine/marijuana	1 (50)	0	1 (50)	0	2
Crack/alcohol	1 (33)	0	0	2 (67)	3
Crack/marijuana	0	0	2 (100)	0	2
Crack/cocaine/ alcohol	1 (50)	0	0	1 (50)	2
Crack/cocaine/ alcohol/marijuana	0	0	0	1 (100)	1
Unknown	0	0	3 (100)	0	3

Note: Sample n=218
Source: Goldstein *et al.*, 1989, p.664.

Goldstein's research suggests the primary link between illicit drugs and homicide is systematic, rather than psychopharmacological or economically compulsive. In a recent summary of his work, he discusses the general relationship between illicit markets and violence which he believes his research suggests:

"Systematic violence tended to be associated with whatever particular drug was dominating illicit street markets at the time that data were being collected. Through the roughly fifteen years that the author has been engaged in drugs/violence research the primary drug related to systematic violence has changed from heroin to powder cocaine to crack cocaine. Had the research been undertaken in the USA in the 1930s, the primary illicit drug associated with systematic violence would, undoubtedly, have been alcohol." (Goldstein, 1997, p.117)

Reuter *et al.* (1990) studied cocaine dealers in the District of Columbia (Washington D.C.) in the mid 1980's. As part of the study, Reuter *et al.* (1990) estimated dealer's risk of murder and injury. Street-level cocaine dealers were estimated to have an average risk of homicide of 1.4%, and an average risk of serious injury of 7%, for every "regular dealer year" (a regular dealer is defined as someone who sold more than one day per week). If these rates persist for a decade a drug dealer has an average risk of being a homicide victim of 14%, and an average risk of serious injury of 70%.

Only very broad crime statistics were available to make these calculations (eg. number of people arrested in the district for a drug offence). Reuter *et al.* (1990) had to employ a number of assumptions to make the risk calculations. The drug dealing population had to be estimated using police statistics on the number of people charged with a drug offence. This base figure was then converted into the number of regular drug dealers using information collected about the frequency of drug dealing amongst the sample. Additional assumptions used in the calculation were, the police estimate that 50-80% of murders in the area are drug related, the ratio of injuries to killings is the same for drug-market related shootings as for all shootings, and adding 25% more injuries to cover injuries caused by weapons other than guns.

The risk of drug dealing is very high even when compared with sections of the population in the United States who suffer from very high rates of violence (Reuter *et*

al., 1990). The average lifetime risk of homicide for a white male is 0.007%, compared to 0.04% for a black male (Reuter *et al.*, 1990). For adolescent black males, for whom homicide is the leading cause of death, the average cumulative risk of homicide between the ages of 25 and 34 is 1.3% (Reuter *et al.* 1990). Reuter *et al.* (1990) acknowledge:

"This study's data and conclusions are highly specific to the District of Columbia in the mid 1980's. In other communities with less violence and less stringent enforcement, the returns to drug selling may be less. The study's results may help focus attention on the policy importance of understanding the dynamics of drug-selling markets." (p. v)

2.3.3 Illicit Drug Markets and Violence

There are a number of studies of specific illicit drug markets, or small groups of drug dealers, that have contributed to the understanding of violence in illicit drug markets. Again, these studies are from the United States and deal largely in the illicit markets for cocaine and heroin. These studies largely comprised of anecdotal accounts by participants, and secondary sources of information. Consequently, it is difficult to draw general inferences about illicit drug markets as a whole from these studies. The value of these case studies is they provide a level of detail about the operation of illicit drug markets which cannot be obtained from aggregate statistical work.

Mark Moore's (1977) analysis of the heroin market in New York City in the 1970's remains an important source in the literature. Moore(1977) identifies the vulnerability of exchange parties in illicit drug markets:

"The threat of arrest and imprisonment is probably the most significant problem created by illicitness. However, illicitness has an additional effect: not only are the dealers threatened by the police - they are also effectively denied police protection. No police and courts will respond to a heroin dealer's complaints that his property has been stolen, implied contracts broken, or his business embezzled by employees.....The dealer can rely on nothing other than his own ability to protect, retaliate, or inspire respect among his criminal associates. In the face of enormous opportunities for gain and fragile social institutions, "honor among thieves" can disintegrate rapidly. Thus the isolation that results from illicitness exposes heroin dealers to threats from other criminals." (Moore, 1977, p.41-42)

Patricia Alder (1985) studied upper level cocaine and cannabis dealers in SouthWest County (United States) during the early 1980's. The interviews she conducted with drug dealers indicated violence was rare in the market:

"The rare incidences of violence I observed were "noncompetitive," primarily oriented toward collecting debts and only secondarily aimed at getting revenge. Violent behaviour was least prevalent in the upper echelons of the prestige hierarchy. Individuals at these levels generally excluded others from their business dealings if they committed offensive acts. Ostracism was considered sufficient retaliation for burns [quality fraud], rip-offs [robbery], security violations, and other disreputable behaviour. At the lower end of the prestige hierarchy, where rip-offs and burns were more common, drug traffickers chased, threatened, and occasionally hit each other. In the end, though, the guilty parties usually either capitulated to the threats or fled the area and hid. Ultimately, little violence occurred even among this group." (my explanation, p. 119-20)

Reuter and Haaga (1989) interviewed incarcerated cocaine dealers as part of a study of the upper level drug market. One of their concluding observations concerned the level of violence in the market :

"It is possible to function as a high-level dealer without recourse to violence.....The violence of street-level cocaine markets in recent years, as well as the "wars" that have occasionally characterised the Miami wholesale cocaine market, cannot be denied. But not only did our subjects report little use of violence themselves..... they also had little experience of explicit threats or even a sense of danger in the higher levels of the trade." (Reuter and Haaga, 1989, p. xii-xiii)

The autobiographical volume written by Harold S. Long (1988) is a first hand guide of how to succeed as a drug dealer in the United States. Long (1988) acknowledges violence is a real risk in the drug business in the United States, but reports he was only robbed once, the adoption of a range of security precautions ensured it "never happened again."

2.3.4 The Cannabis Market and Violence in New Zealand

Violence in the cannabis market has been a growing concern in New Zealand since the early 1980s when cannabis emerged as a popular illegal commercial crop (Yska, 1990). Violence has resulted from the theft of cannabis crops, and from disputes over transactions and possession. The relationship between cannabis and violence has received increased attention in recent years with renewed political interest in cannabis law reform, and the publication of a number of studies of cannabis use and its social consequences (see Drug Policy Forum Trust, 1997; 1998; Casswell and Abel, 1993; Te Rununga, 1995; Poulton *et al.*, 1997; Walker *et al.*, 1998; Ministry of Health, 1996; Drugs Advisory Committee, 1995).

Poulton *et al.* (1997) studied the cannabis use of a group of New Zealand young people at age 15, 18, and 21. At age 21, 70.5% of those who had being convicted of a violent offence or self-reported violent behaviour had used cannabis 6 times or more. Poulton *et al.* (1997) concluded:

"Although this does not establish a causal link between cannabis use and violent behaviour, it does indicate the two are meaningfully related." (p.70)

Poulton *et al.* (1997) suggested three possible explanations for the cannabis/violence relationship. First, violence is a feature of the illicit market in which cannabis is currently traded and purchased. Second, cannabis consumption increases the propensity of users to commit violent acts. Third, violent behaviour is the result of a third unknown factor, for example pre-existing behavioural problems or other substance use.

Dr. David Hadorn, Director of the New Zealand Drug Policy Forum Trust[2] responded to the Poulton *et al.* (1997) paper in correspondence to the *New Zealand Medical Journal* (Hadorn, 1997).[3] He rejected the suggestion that cannabis consumption induces violent behaviour, quoting the findings of the United States National Commission on Marihuana and Drug Abuse (1973) which found no evidence that cannabis use induces violent behaviour.[4] Dr. Hadorn points out the Poulton *et al.* (1997) study failed to control for alcohol use which is widely held to play a causal role in violent behaviour.

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[2] The Drug Policy Forum Trust is a group of scientists and professionals dedicated to elevating the level of debate concerning illicit drug policy in New Zealand. Its members view drug use as primarily a public health issue. In 1997 they circulated a discussion paper on cannabis law reform, *Alternative Systems of Cannabis Control in New Zealand: A Discussion Paper* (1997), which was latter developed into a policy recommendation, *New Zealand Should Regulate and Tax Cannabis Commerce: Final Report* (1998).

[3] Also see correspondence from Dr. David M Fergusson (Executive Director, Christchurch Health and Development Study, Christchurch), "Cannabis use in Young New Zealanders"(letter) *New Zealand Medical Journal* 25 July, vol.110, 1997, p.279), and correspondence from Richie Poulton (letter), *New Zealand Medical Journal* 25 July, vol.110, 1997, p.279.

[4] In a subsequent letter to the New Zealand Medical Journal (25 July, 1997), Richie Poulton clarifies the findings of the National Commission on Marihuana and Drug Abuse(1973). The report stated "No evidence exists that marihuana use will cause or lead to the commission of violent or aggressive behaviour by the *large majority of pyschologically and socially mature* individuals in the general population" (italics added). Poulton points out there is a significant minority of "vulnerable" individuals for whom the reports statement does not apply.

Dr. Hadorn goes on to suggest the unregulated illegal market is the primary source of violence with cannabis in New Zealand. He quotes the recent United States Justice Information Center study on the link between illicit drugs and violence:

"Illegal drugs and violence are linked primarily through drug marketing: disputes among rival distributors, arguments and robberies involving buyers and sellers, property crimes committed to raise drug money and, more speculatively, social and economic interactions between the illegal markets and the surrounding Communities." (Hadorn, 1997, p.216)

Recent studies of the New Zealand cannabis market have reported anecdotal evidence of violence related to the market. In the Te Runanga O Te Rarawa Cannabis Project Report (1995) a spokesperson for the New Zealand Police indicated the link between cannabis and violence was mainly in the area of grower competition and theft. The police spokesperson is quoted as saying:

"There are serious offences every year where the significant factor is involvement with cannabis whether as a user or dealer. Some are in retribution for alleged thefts from each other, some because the offender believes the victim has cannabis, or the proceeds of a cannabis sale are freely available, and the offender is in a position to take them." (Te Runanga, 1995, p.50).

The level of violence in the cannabis market in New Zealand appears to be on a much smaller scale than that reported in the cocaine and heroin markets in the United States (Staff, 1988; McLauchlan, 1996; Te Rununga, 1995; Yska, 1990; Walker *et al.*, 1998). When questioned about the levels of violence in the cannabis market in Northland (a major cannabis growing area in New Zealand) the drug liaison officer for the area explained:

"This isn't Miami Vice, you know. I mean we occasionally come across things like that, and yes, we do carry firearms and flakjackets [during cannabis recovery

operations only] just in case, but most commercial cultivators are more horticulturally minded than criminally minded.....when they get busted, well they get pissed off [annoyed] but they don't get aggro [violent]. It's a game of cops and robbers, cowboys and indians." (my explanation, McLauchlan, 1996, p.117)

The reporter continues:

"Occasionally the police hear about assaults over dope-growing territory and deals gone sour, but you don't get Mr Asia-type killings [infamous international heroin dealer from New Zealand], he says, like you do over class A narcotics like heroin."(my explanation, McLauchlan, 1996, p.117)

2.4 Cheating in Illicit Drug Markets and Drug Control Policy

The level of cheating in illicit drug markets has important implications for drug control policy. "Cheating" is the general economic term for violating voluntary agreements or standing property rights. In the context of illicit drug markets it includes behaviour such as assault, robbery, product fraud, and quality fraud. The level of cheating in an illicit drug market defines the magnitude of the social benefits from legalizing and regulating the illicit market.[5] If the illicit drugs market is very unreliable, there may be significant social benefits from legalizing and regulating the market. Alternatively, if the illicit drugs market is relatively reliable, the social benefits from legalizing and regulating the market are likely to be small.

The magnitude of the social benefits from the legalization and regulation of illicit drug markets is further complicated by the broader issue of how much violence legalization would actually eliminate. Opponents of legalization have pointed out the possibility of

[5] Note I am only referring to the social benefits from legalizing and regulating the illicit market not the wider social benefits from the legalization of drugs. The wider social benefits of legalizing drugs would include the savings on the criminal justice system, lower crime rates, etc. Comprehensive benefit-cost studies of the legalization of drugs have been undertaken by Ostrowski (1990).

the survival of an illicit market if taxation and regulation were too strict (Keilman and Saiger, 1990; Jacobs, 1990). Violent criminals may simply find a new illicit industry to operate within. There is also the issue of how the increase in drug use following any liberalisation of drug laws would contribute to violence in society (Wilson, 1990; Inciardi and Saum, 1996).

The reliability of illicit drug markets also has important implications for any proposed decriminalisation[6] of illicit drugs. Decriminalisation is a broad term used to describe drug control policies which relax the legal penalties for possession and cultivation offences, but maintain the penalties for drug trafficking (Drug Policy Forum Trust, 1997). The Drug Policy Forum Trust (1997) recently evaluated a range of decriminalisation options for cannabis in New Zealand. The principal rationale for the decriminalisation of cannabis is adult cannabis users should not be disadvantaged with a criminal record for a relatively minor offence (Drug Policy Forum Trust, 1997). A traditional criticism of decriminalisation is it does not eliminate the 'harmful' illegal market for cannabis (Drug Policy Forum Trust, 1997). In their final report, the authors of the Drug Policy Forum Trust (1998) state:

"Policies other than regulation [ie. legalisation] are likely to result in perpetuation of a thriving cannabis black market, with its attendant harms. This includes *prohibition with administrative expediency principle*, *prohibition with civil penalties*, and *partial prohibition*, all of which leave the black market more or less intact." (italics in original, my explanation, p.5)

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[6] Decriminalisation of a drug refers to a policy where the penalties for the use and possession of small quantities of a drug are reduced to a civil penalty (eg. an on-the-spot fine) rather than a criminal conviction. However a wide range of drug control options are described as decriminalisation (see Drug Policy Forum Trust, 1997). This makes the term less useful. The common feature of these policies is the commercial sale of a drug remains illegal. Full legalization means the drug can be commercially produced and sold, all be it under strict regulations (eg. age limit for purchase, etc).

The authors of the report consider the survival of the illegal market for cannabis to be "fatal" to all decriminalisation options, and consequently recommend the legalisation of cannabis (Drug Policy Forum Trust: Final Report, 1998, p. 2 and 5). If the illicit market for cannabis is in fact relatively peaceful and reliable, its survival will not seriously undermine any decriminalisation policy.

A practical advantage with decriminalisation is it permits gradual change to drug control policy, as opposed to the much more risky policy of outright legalisation. Gradual policy change can serve as low risk experiments, providing useful feedback to develop future policy (Hide, 1987).

Cheating in illicit drug markets can be categorised into five broad types: (i) cheating between exchange parties during retail transactions, (ii) cheating between exchange parties during wholesale transactions, (iii) violence used by third parties to victimise exchange parties, (iv) violence used by sellers to eliminate competitors and gain greater market share, (v) violence associated with protecting drug stocks or drug production sites from third parties. This thesis models the first type of cheating, cheating between exchange parties in retail illicit drug transactions.

2.5 Estimating the Level of Cheating in Retail Illicit Drug Transactions

To estimate the social benefits of legalizing and regulating an illicit drugs market, policy makers require a broad understanding of the level of cheating in the market. The obvious source of such information would be national statistics on drugs and violent crime. There are four reasons why national statistics are not sufficient to calculate the level of cheating in an illicit drug market :

(i) Drug users and drug dealers will not report incidences of victimisation, or will lie about the circumstances of victimisation, to avoid contact with the authorities. Experienced drug researcher Goldstein (1989) explains:

"Victims of systematic violence are very difficult to identify in official records because they frequently lie to the police about the circumstances of their victimization. Not a single research subject whom I have interviewed, who was the victim of systematic violence and who was forced to give an account of his or her victimisation to the police, admitted that he or she had been assaulted because of owing a drug supplier money or selling somebody phony or adulterated drugs. All such victims claimed to have been robbed." (p.36)

The full impact the illicit drugs market has on violent crime is therefore under-represented in official crime statistics.

(ii) The illegality of the market means there is no routine collection of market statistics. Even the most basic economic information on the market, such as prices and quantities traded, remains anecdotal and speculative. Official estimates of the drug-using population involve significant extrapolation from very limited information (see Michaels, 1987).

(iii) The statistics which do exist on drugs and violent crime are generally not detailed enough to identify the exact relationship between the illicit market and violence. Violent offences are not routinely categorise according to drug-related circumstances. Goldstein (1997) explains:

"There are no standardized empirical indicators, nor is there even a consensus, on definitions of drug related violence. There are no national databases in the United States of America, in the criminal justice or the health care systems, that routinely specify the relationship between drugs and violence. Certainly there are no data that allow for comparative analyses of drug-related violence, or comparative assessments of trends over time, between nations or other localities." (p.116)

To determine the number of drug-related homicides in the New York area, Goldstein *et al.* (1992) had to go back to the original police casefiles and attempt to classify homicides as drug-related.

Even when violent offences can be identified as drug-related sufficient information is generally not available to identify the exact role drugs played in the offence. Goldstein (1985; 1989) had to develop his own conceptualisation of the drug/violence nexus to serve as a framework for his research. According to his tripartite framework, drugs and violence can be related in three different ways: psychopharmacologically (ie. violence induced by drug intoxication), economic compulsive (ie. violence to obtain money for drugs), and systematically (ie. violence used to regulate the illicit market). To make this framework operational from a data collection perspective, Goldstein *et al.* (1989; 1992) had to gain the active cooperation of the New York City Police Department.

(iv) Official drug statistics are often distorted by agency agendas and the legal and institutional incentives faced by offenders (see Michaels, 1987; Zinberg, 1987). The risk of distortion is a particular risk with drug statistics because unlike statistics that are widely used by private organisations there is no well defined group of losers from poor drug statistics (Michaels, 1987). The police have historically exaggerated the danger of drug use to deter people from drug use, and as a means of agency expansion (see Musto, 1973; Brecher, 1972). The police also regularly inflate the value of drug seizures by using "street" level prices rather than import prices to give the impression of effective enforcement and significant arrests.

Arrested drug users and drug dealers may conceal information and understate involvement in the market to protect their legal positions (Reuter and Haaga, 1989).

Legal proceedings can continue even after an offender has been convicted and imprisoned. The possibility of parole encourages incarcerated offenders to understate their involvement. Incarcerated offenders also face the possibility of retribution from other inmates if they cooperate with researchers. The incarcerated population only represents participants who have been caught, it cannot include information on those who have successfully avoided arrest (Reuter *et al.*, 1990). There is always the concern that the most efficient operators have been excluded from a study.

Drug users in rehabilitation may inflate their self-reported levels of drug use to increase their self-esteem, or to increase the level of drug maintenance they receive (Michaels, 1987). Drug counsellors have incentives to accept these exaggerated assessments to justify their own positions and subsequent ability to reduce the level of drug use.

2.6 The Property Rights Approach to Illicit Drug Markets

2.6.1 Introduction

The difficulties with using official statistics to calculate the level of cheating in illicit drug markets indicates economic modelling, and original market research, are an appropriate methodology for the task. Economists are in a unique position to model behaviour in illicit markets because of their extensive theoretical knowledge of the legal market. Much of the economic theory related to the legal market will also be relevant to the illegal market. Mark Haller (1980) explains:

"An advantage of thinking of these crimes as illegal enterprises is that such a term focuses on them as a retail business. Those engaged in such activities are criminal entrepreneurs, with many of the problems faced by legitimate businessmen. In order to understand such activities, then, it is necessary to ask the same sort of questions that would be asked concerning other retail business activity. How are the entrepreneurs recruited and how do they obtain capital? How do they train and pay their staffs? How do they advertise? How

are prices set? What groups constitute the customers? What economic and noneconomic factors explain decisions concerning location of the enterprise? There is, however, an important additional question: What difference does it make that the enterprise is illegal? How does the fact of illegality and the policies of law enforcement affect recruitment, pricing, advertising, location, and customers?" (p. 77-78)

A property rights analysis of illicit drug markets can provide a specialist economic framework to analyse the behavioural incentives of the illegal market. Property rights economics provides the tools to analyse the consequences of illegality and the absence of third party enforcement in drug markets. The aim of the next few sections is to explain the property rights approach and provide a brief background to the approach.

Property Rights Economics is a sub-school of a new branch of economics known as New Institutional Economics (Eggertsson, 1990; Rutherford, 1994). New Institutional Economics extends the mainstream Neo-classical Economic theory by introducing information and transaction costs and the constraints of property rights (Eggertsson, 1990).[7] New Institutional Economics is a broad body of microeconomic theory which adopts an information cost approach to economic problems. Eggertsson (1990) writes:

"Neoinstitutional Economics (NIE) is still at an exploratory stage: Definitions and terminology are not fully agreed on, and the use of mathematical models is less pronounced than in recent work in microeconomic theory, but there is stronger emphasis on empirical testing. Yet, in spite of certain differences in approach, common stands can be found in the work of contributors to the NIE." (Eggertsson, 1990, p.6).[8]

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[7] Subschools of New Institutional Economics have been discussed in relation to the extent the Neoclassical core theory is accepted (see Eggertsson, 1990).

[8] Eggertsson (1990) makes a distinction between Neoinstitutional Economics and New Institutional Economics with the later using less of the Neoclassical core. This distinction does not appear to be widely used with most writers simply referring to New Institutional Economics (NIE) (see Rutherford, 1994)

Approaches that are generally considered sub-schools of New Institutional Economics include, Transaction Cost Economics, Law and Economics, New Economic History, the New Industrial Organization, and the New Comparative Economic Systems (Eggertsson, 1990).

Property Rights Economics can be distinguished from the other sub-schools of New Institutional Economics on the basis of its central conceptual focus and the character of its empirical research. The central conceptual interest in Property Rights Economics is ownership structures and how different ownership structures shape individual incentives. A feature of Property Rights Economics is the empirical research which has been carried out in societies and historical periods where property rights differ from the ones we are most familiar with in advanced capitalist economies (ie. private property rights and stable third party enforcement). Areas of research have included, American Indians (Demsetz, 1967; Anderson, 1992; Lueck, 1993; Johnsen, 1986), the American West (Anderson and Hill, 1975; 1979; Anderson and McChesney, 1994), fisheries (Libecap, 1989; Schlager and Ostrom, 1993; Acheson, 1993), socialist economies (Pejovich, 1990), world economic history (North, 1973; 1981; 1987; 1989; 1990), primitive societies (Posner, 1980; Smith, 1993), African tribes (Bates, 1983; Ensminger and Ruten, 1993), land use (Eggertsson, 1993; Ellickson, 1993), and mining rights (Umbeck, 1981; Libecap, 1989).

2.6.2 Property Rights and Economic Behaviour

The property rights approach emerged out of dissatisfaction with aspects of Neoclassical Economics, particularly the assumption of zero information and transactions costs (Smith, 1974). When information and transaction costs are positive, the structure of property rights influence the cost of economic decision making (Coase, 1960).

Property rights are the rights individuals have to use resources. They can be formal legal rights enforced by the police and courts, or informal norms of behaviour enforced through etiquette, custom, ostracism, or violence (see North, 1990). Property rights are "social rights" in the sense they not only define an owners rights to property, but also the owners rights with respect to all others (ie. non-owners) (Alchian, 1965; Demsetz, 1967; Furubotn and Pejovich, 1972). In a summary of the property rights approach, Furubotn and Pejovich (1972) explain:

"A central point noted is that property rights do not refer to relations between men and things but, rather, *to the sanctioned behavioural relations among men that arise from the existence of things and pertain to their use.*" (italics in original, Furubotn and Pejovich, 1972, p.1139)

Property rights ultimately determine the "norms of behaviour," and consequently the "expectations," of individuals within economic systems (Demsetz, 1967; Furubotn and Pejovich, 1972). A property right is a "bundle of rights" describing all the rights an owner has to a resource, including the right to exclude, the right to transfer, the right to transform, and the right to benefit from, a piece of property (Alchian, 1965; Demsetz, 1967; Furubotn and Pejovich, 1972; Tietenberg, 1992).

The value of the property rights approach is property right structures affect decision makers in systematic and predictable ways (Furubotn and Pejovich, 1972; De Alessi, 1980). By assigning the rights individuals have to resources, property rights determine how the benefits and costs of decisions are allocated between the decision maker and all others (ie. which costs/benefits are external to the decision maker) (De Alessi, 1980). Different property right structures present individuals with different benefit and cost consequences (ie. different opportunity sets). The analogy is often drawn between property rights and the rules of a competitive team sport (see North, 1990; Pejovich, 1990;

Barzel, 1989). The rules of the sport characterise how the game is played, including what tactics are successful, which players are valuable, what investments are made in future performance, and how easy it is to cheat. The challenge with the property rights approach is to specify how different property right structures affect a decision maker's opportunity set (Furubotn and Pejovich, 1972). Property rights economists are able to predict the behaviour of individuals in different property right structures by assuming decision makers are attempting to maximise their individual utility within the constraints created by the property right structure (Furubotn and Pejovich, 1972; De Alessi 1980).

Writers in New Institutional Economics have extended the traditional concept of instrumental rationality in mainstream economics (Rutherford, 1994). Rutherford (1994) explains:

"Where rule following is incorporated into New Institutional Economics, it is usually seen as the result of one of four things: (i) information and decision-making costs; (ii) cognitive and information-processing constraints; (iii) the risk of making errors in the attempt to adjust on a case-by-case basis; and (iv) some advantage that flows to the individual by virtue of the fact that his behaviour is rule determined" (Rutherford, 1994, p.68).

Utility maximisation is sometimes held to occur in the context of bounded rationality (ie. limited cognitive ability), and rational ignorance (ie the costs and benefits of acquiring new information) (see Williamson, 1975; 1985). These extensions of the concepts of rationality and maximisation suggest the decision making of economic agents should be modelled, as much as possible, in the way they themselves view and calculate the choices (Furubotn and Pejovich, 1972; Hide, 1987; Nell, 1994). In many situations this suggests broad simple decision making criteria (ie. "satisficing" decision making criteria).

The cost of specifying and enforcing property rights mean they are never perfectly specified or perfectly enforced (see Demsetz, 1964; Barzel, 1989). Consequently, there

are always gains from opportunistic behaviour, such as free-riding, shirking, cheating, adverse selection, and moral hazard (Barzel, 1989). Perceptions about the fairness of property rights can convince individuals to abide by them even when it is in their immediate interest to break them (North, 1981). Ideology, religion, social ethics, and group norms, can reduce the cost of enforcing property rights by encouraging voluntary compliance (North, 1981; Axelrod, 1986; Akerlof, Simmons and Schwartz-Shea, 1993).

The property rights approach demands the study of the social context of economic problems. In this sense it is a move away from the abstraction and formalism of mainstream Neoclassical Economics. The change in focus creates the opportunity for 'new' research methodologies. Posner (1993) explains:

"Intensive scrutiny of particular institutions implies in turn an emphasis on the case study, relying heavily on histories and ethnographies, judicial opinions, and other court records, newspaper and magazine accounts, and even interviews, rather than on studies of aggregated data, using statistical methodology." (p.76)[9]

2.6.3 Criticisms of New Institutional Economics

Many writers have welcomed the interest of mainstream economists in institutional structure (Field, 1981). Others have recognised the information cost approach as having applications in their own disciplines (Bardhan, 1989; Nabli and Nugent, 1989; Zald, 1987; Martin, 1993; also see Furubotn, 1993). New Institutional Economics has reinvigorated the traditional debate over institutions in economics.[10] It has reminded writers concerned

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[9] Posner (1993) thinks this should not lead to the "rejection of economic formalism," which he terms the "negative side" of new institutional economics. He writes: "I do not doubt for a moment that there is a place in economics for case studies guided by informal theory - an apt description, in truth, of much of my own work - and therefore for the new institutional economics. But I reject any suggestion that the new institutional economics ought somehow to displace the rest of microeconomics." (p.76).

[10] The traditional school of institutional economics is based on the work of Thorstein Veblen, John Commons, Wesley Mitchell and others. It is often referred to as the Old Institutional Economics (OIE) (see Hodgson, 1989)

with institutions that institutions do arise from the actions of individuals, and competition and efficiency are factors in institutional development (Rutherford, 1989; Basu, Jones and Schlicht, 1987). Martin (1993) has suggested New Institutional Economics has also introduced greater theoretical rigor to the study of institutions, requiring the statement of assumptions, the explanation of logical relationships, and the formalization of models. The methodological criticisms of New Institutional Economics are largely restricted to the explanation of how property rights emerge and evolve.

A number of economists attempted to extend the New Institutional agenda by using largely neoclassical theory to explain how property rights and institutions emerge and evolve. This program has been criticised for using simplistic market based explanations of institutional change, and for emphasising the efficiency of the process of institutional change (ie. a historical functionalism or vulgar Darwinism) (Martin, 1993; Bardhan, 1989; Langlois, 1989; Basu, Jones, and Schlicht, 1987). The market view of institutions, and the persistence of the use of the abstract individual, lead to the charge that institutions were not treated as genuine constraints (ie. institutions were not taken "seriously enough") (Martin, 1993; Field, 1979; Langlois, 1989; Rutherford, 1989; Hodgson, 1989). Zald (1987) concludes:

"Transaction-cost analysis is most powerful when it deals with forms of social organization that are least institutionalized; that is, when the form is adopted explicitly in an instrumental mode to achieve specific ends (eg. clauses in a contract dealing with ex post renegotiation or franchising agreements). It is useful but one-sided when used to examine organizational forms that have some medium level of institutionalization (eg. multidivisional as compared with functional departments). It will lead to gross oversimplifications when it is applied to our most basic institutions, for example, the commodification of labor, the development of labor markets, and the development of the coporate form." (p.707).

This may explain the popularity of casestudies in the Wild West and early colonisation of America in the early Property Rights literature. These are social environments where a

large part of the institutional structure is yet to be established (or must be established anew) (eg. ownership of land and resources, resolution of disputes).

There has been considerable progress in addressing the methodological problems with the early models of institutional change. The "naive" market models of institutional change have been replaced with more sophisticated modelling of the political process and the pathways of institutional development (Eggertsson, 1990; see Libecap, 1989). There is a greater appreciation of the forces that retard institutional change and make institutions enduring (ie. stakeholders, politicians, bureaucrats, legal and judicial precedents, distribution precedents, ideology, cultural norms, religion) (Libecap, 1989; Akerlof, 1976; Axelrod, 1986). There is also a greater appreciation of the forces which direct change down non-optimal paths of institutional evolution (ie. "lock in", increasing returns to adoption, learning effects, coordination effects, adaptive expectations, historical precedent) (North, 1990; Setterfield, 1993).

Another methodological criticism of New Institutional Economics is the absence of a concept of power in the explanation of market outcomes and the evolution of institutions (Zald, 1987; Bardhan, 1989; Martin , 1993). Martin (1993) explains:

> "..power is related to at least three fundamental features of transactions... First, it is related to the capacity to realize interests through transactions, and thus to the security of investments in the transaction; the greater the power of the actor in the transaction the greater the probability of realizing interests and thus the greater the incentive to maintain the integrity of the transaction. Second, it is related to the terms in which contracts are specified and thus to the incentives to opportunism: imbalances in power lead to inequitable contracts which lead to high incentives for opportunism. Third, power is related to information asymmetries, distortions in information flow being systematic rather than random (through socialization, education, mass communication, as well as through information distortion by parties to the transaction)." (p.1092)

Economists that apply the more advanced model of institutional change have been able to incorporate power imbalance into their analysis (see Anderson and McChesney, 1994).

2.7 Conclusion

One of the social benefits from legalizing drugs is the elimination of the violence related to the unregulated illicit drugs market. Studies of the relationship between illicit markets and violence suggest illicit markets have had an influence on the level of violence in society, but there remains considerable disagreement about the importance of illicit markets as a causal factor in violence amongst other possibly historical and environmental factors. Economic theory is required to explain the role violence plays in the operation of illicit drug markets, and in particular why levels of violence appear to vary between drug types (eg. crack cocaine vs. cannabis), and between locations (eg. United States vs. New Zealand).

The level of "cheating" in illicit drug markets defines the magnitude of the social benefits from legalizing and regulating the illicit market. "Cheating" is the general economic term for violating voluntary agreements or standing property rights. In the context of illicit drug markets it includes behaviour such as assault, robbery, product fraud, and quality fraud. If the illicit drugs market is very unreliable, there maybe significant social benefits from legalizing and regulating the market. Alternatively, if the illicit drugs market is generally reliable, the social benefits from legalizing and regulating the market are likely to be small.

The reliability of the illicit drugs market also has important implications for the decriminalisation of drugs. The traditional criticism of decriminalisation is it leaves a 'harmful' illicit market intact (Drug Policy Forum Trust, 1997; 1998). If the illicit

market is actually relatively peaceful and reliable, its persistence will not count significantly against a decriminalisation policy. Decriminalisation options have the practical advantage of bringing about gradual change to drug control policy.

Cheating in illicit drug markets can be categorised into five broad types: (i) cheating between exchange parties during retail transactions, (ii) cheating between exchange parties during wholesale transactions, (iii) violence used by third parties to victimise exchange parties, (iv) violence used by sellers to eliminate competitors and gain greater market share, (v) violence associated with protecting drug stocks or drug production sites from third parties. This thesis models the first type of cheating, cheating between exchange parties in retail illicit drug transactions.

To estimate the social benefits of legalizing and regulating an illicit drugs market, policy makers require a broad understanding of the level of cheating that exists in the market. There are four reasons why national statistics on drugs and violent crime cannot be used to perform such a calculation: (i) drug users and drug dealers will not report incidences of victimisation, or lie about the circumstances of victimisation, to avoid contact with the authorities (Goldstein, 1989), (ii) the illegality of the market means there is no routine collection of market statistics (Goldstein, 1997), (iii) the statistics which do exist on drugs and violent crime are not detailed enough to identify the exact relationship between the illicit market and violence (Goldstein *et al.* 1989; 1992), (iv) official drug statistics are often distorted by agency agendas, and the legal and institutional incentives faced by offenders (Michaels, 1987; Zinberg 1987). Economic modelling and original market research is therefore an appropriate methodology to measure the reliability of illicit drug markets.

Economists are in a unique position to model behaviour in illicit markets because of their existing theoretical knowledge of the legal market. Much of the economic theory of the legal market will also be relevant to the illegal market (Haller, 1980). Property rights economics can be used to model the behavioural incentives of the illegal market environment.

3. The Likelihood of Voluntary Cooperation in the Retail Illicit Drug Transactions

3.1 Introduction

Illicit drug transactions are widely held to be unreliable because exchange parties cannot call on the police and courts to enforce terms of exchange (see Moore, 1977; Barnett, 1987; Paul and Wilhite, 1994; Miron and Zwiebel, 1995). The reliability of illicit drug transactions is essentially a problem of cooperation in the absence of third party enforcement, or voluntary cooperation.

There is an established body of economic theory on the likelihood of cooperation when the state is absent. Property rights economists have challenged and extended this theory in a number of important ways. This chapter reviews this literature and investigates its relevance to retail illicit drug transactions. The reliability of drug transactions is initially modelled as a two person prisoners dilemma game. The chapter goes on to investigate whether recent solutions to the prisoners dilemma are applicable to the illicit drugs market.

3.2 Voluntary Cooperation and the Prisoners Dilemma

The prisoners dilemma concerns two suspects who are being questioned separately by the police about a crime they have jointly committed. They can either "confess" to the crime or stay "silent." The length of sentence each receives is determined by what they choose to do in conjunction with what their partner chooses to do. If both prisoners stay silent they will only have to serve the minimum sentence of 1 year. If one prisoner confesses and the other stays silent, the informant will be set free while the other prisoner will receive an extra long sentence of 5 years. If both suspects confess they

both receive 3 years. There are no appeals, and nothing can be retracted once a suspect has learnt what their partner has chosen to do. The possibly pay-offs from the situation are presented in Figure 3.1.

Figure 3.1: The Prisoners Dilemma Game

	P1 silent	P1 confess
P2 silent	(1, 1)	(5, 0)
P2 confess	(0, 5)	(3, 3)

The best collective outcome is achieved when both prisoners stay silent. The best individual strategy is to confess. Confessing will yield the best individual pay-off no matter what your partner chooses to do. If your partner stays silent while you confess, you will be set free, which is better than the 1 year sentence you would have received if you had also chosen to stay silent. Alternatively, if your partner confesses and you also confess, you get the 3 year sentence, which is better than the 5 year sentence you would have received if you had stayed silent while your partner had confessed. By confessing a prisoner avoids the extra long sentence if their partner confesses and has the chance of being set free if their partner stays silent. Unfortunately, both self interested prisoners will analyse the options the same way and so both will choose to confess. The result is both receive 3 years. This is less than satisfactory as both knew if they had been able to stay silent they would have only had to serve a 1 year term.

The dilemma facing the prisoners can be described as having two parts. First, the prisoners know there are collective benefits from staying silent (ie. cooperating) but each prisoner also knows there are even greater individual benefits from confessing while their partner stays silent (ie. free-riding). Second, even if a prisoner is naturally inclined to stay silent they cannot be sure if they stay silent their partner will not confess to gain their freedom, leaving them with the extra long sentence to serve. Consequently, even potentially reliable prisoners are encouraged to confess. They cannot take the risk their partner will confess while they stay silent (ie. inflicting the "sucker" pay-off). The disturbing conclusion of the prisoners dilemma is greed and mistrust will prevent self interested individuals from cooperating to their mutual benefit.

The themes in the prisoners dilemma are present in two other influential expositions of voluntary cooperation, Garrett Hardin's "The Tragedy of the Commons," and Mancur Olson's "Logic of Collective Action" (Wade, 1987). In the Tragedy of the Commons, the herdsman adds one more cow to the commons because they know there are private benefits from doing so while all the other herdsmen exercise restraint (Hardin, 1968). The remaining herdsmen will eventually follow suit, and also add another cow to the commons, because they do not want to be the only ones exercising restraint. As a result, the commons is overgrazed and destroyed for all.

Similarly in the "Logic of Collective Action" citizens are aware of the collective benefits from the production of a public good but also know if the public good is produced they cannot be excluded from its use. The best individual pay-off is to "free-ride" on the contributions of others. In these circumstances even citizens who are inclined to contribute to the public good may choose not too because they do not want to subsidise free-riders. As a result not enough contributions are collected and the public good is not produced.

The incentive to "free-ride" (ie. greed), and the fear of being the "sucker" (ie. mistrust), appear to prevent self-interested individuals from realising the gains from cooperation when there is no third party to enforce agreements. The incentive to free-ride on the cooperative efforts of others is considered by many economists to be the essential feature of voluntary cooperation. The lesson of the prisoners dilemma is routinely applied to any situation where third party enforcement is absent.

3.3 A Prisoners Dilemma Model of Retail Illicit Drug Exchange

The situation facing exchange parties in the retail illicit drugs market can be easily presented as a prisoners dilemma game. If both exchange parties honour the terms of a drug transaction both benefit, the buyer obtains valuable drugs, the seller black market profits. However, each knows they could do even better if they cheat on a transaction while their exchange partner honours the transaction. Figure 3.2 presents illicit drug exchange as a prisoners dilemma game. [1]

[1] The pay-offs in Figure 3.2 were calculated using the demand equation y = 5 - X, and the supply equation y = 1 + x, producing the equilirium price, Pe = 3, and equilibrium quantity, Qe = 2. The benefits of exchange were the respective consumer and producer surplus (2, 2). If the buyer is cheated they loose all the area under the demand curve, (-8). If the seller is cheated they loose all area under equilibrium price curve, (-6). The losses from cheating are discussed in greater detail in the next chapter.

Figure 3.2: A Prisoners Dilemma Model of Retail Illicit Drug Exchange

	seller honours	seller cheats
buyer honours	(2, 2)	(-8, 6)
buyer cheats	(8, -6)	(0, 0)

Again, the dominant strategy for a self interested exchange party is to cheat. From the sellers point of view cheating is the preferred option because 6 > 2 (ie. free-ride vs. cooperate) and 0 > -6 (ie. cheat vs. suckered). Cheating is also the preferred option for the buyer because 8 > 2 and 0 > -8. Both self interested exchange parties will choose to cheat, the transaction will break down, and both will receive 0. If they had both honoured the terms of the transaction they could have both received 2. The prisoners dilemma suggests greed and mistrust will prevent self interested exchange parties from reliably realising the gains from illicit drug exchange.

3.4 The Prisoners Dilemma Revisited

Robert Wade (1987) has challenged the general application of the prisoners dilemma to situations where third party enforcement is absent.[2] He points out, two key assumptions must hold if a situation is to be plausibly modelled as a prisoners dilemma game: (i) players are not permitted to communicate with each other before deciding what to do, and (ii) players choose only once before receiving the pay-off (Wade,

[2] also see Ellickson (1991; 1993) for additional examples of how prisoners dilemma situations are avoided.

1987). The first assumption has the important implication that players cannot get together before playing the game and negotiate changes in the rules which will make cooperation more likely (Wade, 1987). The second assumption means players cannot find out what their opponent has chosen to do before they decide what to do (Wade, 1987). These assumptions are appropriate to explain the behaviour of interrogated prisoners but by no means characterise all voluntary social interaction.

Property rights economists have discovered a range of informal institutions which facilitate voluntary cooperation.[3] They include, informal third party enforcement, credible retaliation, compensation and arbitration, social conditioning, cross-cutting allegiances, dense social interaction, and conditional cooperation. Other property rights economists have challenged the behavioural assumptions of the prisoners dilemma (see Simmons and Schwartz-Shea, 1993; North, 1981; 1990). Game theorists have developed strategies to encourage cooperation even when the prisoners dilemma is largely unaltered (see Axelrod, 1981; 1990). The next step is to examine these solutions to see if any of them are relevant to illicit drug transactions.

3.5 Solutions to the Prisoners Dilemma and the Retail Illicit Drugs Market

3.5.1 Introduction

Economists have come to understand the essence of the problem of voluntary cooperation is information. The mutual gains from cooperation can only be reliable

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[3] see Bates, 1983; Umbeck, 1981; Posner, 1980; Libecap, 1989; Anderson and Hill, 1975; 1979; Anderson and McChesney, 1994; Demsetz, 1967; Roback, 1992; Lueck, 1993; Acheson, 1993.

realised when exchange parties possess a level of certainty about each others behaviour (Schofield, 1985). There needs to be a mutual awareness amongst prospective exchange parties that those who cheat will be punished in some manner (Schofield, 1985; Wade, 1987). This assurance makes cheating unprofitable, and makes it safe to honour the terms of agreements. This level of certainty can come from existing social institutions, or from experience of the behaviour of others. Social institutions and past experience modify the key assumptions of the prisoners dilemma. The solutions to the prisoners dilemma presented in the following sections draw on one or both of these modifications.

3.5.2 Informal Third Party Enforcement

The traditional solution to the prisoners dilemma is to introduce a third party to force individuals to cooperate by punishing those who cheat (Hardin, 1968). The third party we are most familiar with is the state and its formal enforcement institutions the police and courts. The police and courts are not available to exchange parties in illicit drug markets, but effective third party enforcement does not necessarily require the state. Other private organisations could conceivable fill the function of enforcer and arbitrator.

A possibly source of third party enforcement which has been discussed in the context of illicit drug markets is organised criminal groups, such as the Mafia in the United States or gangs in New Zealand. Reuter's (1983) study of the Mafia in New York reported several examples of the Mafia providing arbitration services in illicit markets. However, Reuter(1983) concluded several features of Mafia organisation prevented it from providing a more comprehensive market-wide enforcement service, including, the inconsistent enforcement of judgements, the problems of sharing information in illegal organisations, and ill defined property rights within the organisation itself. Studies of retail illicit drug markets in the United States report no Mafia presence as an

external enforcer of transactions in the market (Moore, 1977; Alder, 1985; Reuter *et al.*, 1990). The Mafia's involvement with illicit drugs is said to be at the upper levels of the market, financing the purchase of large shipments of drugs or in the importation and distribution of drugs (Rubin, 1973).

The secrecy and wide geographical distribution of drug transactions would be a serious impediment to private enforcement in the market. The "public good" nature of enforcement and arbitration would certainly make it difficult for criminal organisations to fund such a service. The collection and enforcement of taxes would be difficult without alerting the authorities.

3.5.3 Credible Physical Retaliation

Social order can be maintained without third party enforcement if private individuals are able to guarantee credible retaliation (Bates, 1983; Umbeck, 1981; Posner, 1980; Anderson and McChesney, 1994). Certain retribution for cheating reduces the benefits from cheating. If retribution is severe enough it can virtually remove cheating as a rational option (Bates, 1983). Credible retaliation can be a matter of physical ability with violence, proficiency with armaments, or military organisation (Umbeck, 1981; Posner, 1980; Anderson and McChesney, 1994).

In advanced economies the state has a virtual monopoly over organised violence, and generally discourages private citizens from owning and using weapons. This leads to large disparity in ability with force between those citizens who have a strong and determined interest in weapons and the vast majority who do not. The absence of the state from criminal markets creates an incentive for professional criminals to become proficient with violence. Alder's (1985) observation of cocaine and cannabis dealers confirms this tendency:

"Dealers and smugglers as a group were overwhelmingly large in size. Before meeting a new drug trafficker I could expect that, at minimum, he would be six foot and weigh 180 pounds. The reason for this also lay in self-selection, for although violence was rare in Southwest County it was fairly common in the drug world more generally. Regardless of whether an individual ever had to resort to violence it lay behind all business relationships as a lurking threat. As Moore has noted, 'muscle' in the drug world refers to one's perceived capacity for violence more than its continued demonstration. People who felt unsure of their ability to be aggressive or to physically defend themselves were less likely to venture into drug trafficking." (p.95)

Alder's (1985) observation suggests criminal entrepreneurs engaged in selling drugs will generally be more proficient with physical force than drug users from the general population. The gap in proficiency with violence between drug dealers and drug users suggests a power imbalance which may permit dealers to cheat sellers.

One way individuals can ensure credible retaliation for cheating is to be part of a vengeance group (Posner, 1980; Bates, 1983). A vengeance group is a group of individuals who agree to retaliate collectively if any one of them is attacked. This ensures retaliation even if the victim is incapacitated or killed in the original attack. The collective obligation to retaliate also creates incentives for the group to monitor and discipline its own members, because a transgression by one individual will involve the whole group in a conflict. In extreme situations the group may offer to punish their own member, or hand over a guilty member to the victims kin, to prevent a more widespread conflict. Vengeance groups are common in tribal societies where membership is based on kinship or family relationships.

Gangs that sell illicit drugs are said to employ a group vengeance ethic. The influence vengeance groups have on the reliability of transactions will depend on the market share gangs have at the retail end of the market. In most instances consumers will be able to buy from non-gang sources. It is unlikely drug consumers will be able to sustain vengeance groups beyond their existing personal ties. Apart from the considerable

transaction costs of trying to organise a group of secretive individuals the vengeance group has to cohesive enough to overcome the incentive to "free-ride" (Eggertsson, 1990). People will naturally be reluctant to put their lives on the line on the behalf of others. In tribal societies commitment to the group is maintained by the supernatural belief that those who fail to honour their kinship duties will suffer great misfortune (Eggertsson, 1990). It is unlikely drug consumers will share similar collective beliefs.

3.5.4 Compensation and Arbitration

A system of compensation requires those who cheat to reimburse their victims. Systems of compensation are only effective when backed by credible retaliation or third party enforcement. Compensation is a way to resolve a confrontation without socially costly violence (Bates, 1983). The possibility of having to pay compensation for cheating reduces the benefits of cheating.

Systems of compensation often include a neutral arbitrator who negotiates the level of compensation (Bates, 1983). The first duty of an arbitrator is to communicate to the transgressor the determination of those victimised to retaliate for their injury if not satisfied.

Past studies of illicit drug markets have revealed no accepted system of compensation for cheating on illicit drug transactions (Moore, 1977; Alder, 1985; Long, 1988). Organised crime is said to have an established system of compensation and arbitration for transgressions but as was explained earlier its influence at the retail end of the illicit drugs market is likely to be minimal (Reuter, 1983).

3.5.5 Social Conditioning

The prisoners dilemma game assumes players are self interested. Some property rights economists have challenged this narrow definition of human behaviour (North, 1981; Simmons and Schwartz-Shea, 1993). They accept decision making is often motivated by self-interest, but point out it is also influenced by social conditioning. Ideological belief, and group identity, can convince individuals to put aside their immediate self interest in favour of the collective interest. Social norms of behaviour can be strongly enforced through the employment of a metanorm. A metanorm requires the punishment of not only people who violate a social norm but also all those who do not join in the punishment of the offender (see Axelrod, 1986; Akerlof, 1976). Social conditioning facilitates cooperation by making social behaviour predictable.

Drug users come from a wide cross section of the population and will bring a diverse set of values to illicit drug transactions. As citizens of advanced market societies they are likely to have internalised the values of the market. One of the most fundamental values of the market is the belief in the fairness of exchange. This belief leads to ethical prescriptions against cheating. Buyers and sellers will take these beliefs and prescriptions with them when they transact in the illicit drugs market. The social conditioning which discourages cheating in the legal market may also influence behaviour in the illegal market.

A number of features of the illicit drugs market will undermine any internalised prescriptions against cheating. First, the ruthless pursuit of profit is also an accepted value of the market. Profit-maximising entrepreneurs are expected to test the rules of the market, and exploit inadequacies if it is an opportunity for profit. The profit motive suggests there will be widespread cheating when the rules of the market are not adequately enforced. Second, drug users purchase their drugs from criminal

entrepreneurs. These criminal entrepreneurs exploit the conditions of prohibition by charging exorbitant black market prices for drugs, and by supplying drugs of uncertain quality (Long, 1988). These business practices are likely to erode any goodwill that exists between buyer and seller. Some drug consumers will also be addicted. The addictive craving will sharpen their self-interest.

Self-interest is also likely to be strong on the supply side of the market. Drug dealers are criminal entrepreneurs concerned with making the most profit before they are arrested or eliminated by competitors (Long, 1988). They are unfettered by either legal sanction or ethical code (Long, 1988; Nell, 1994). The lawlessness of the market is likely to demand a degree of ruthlessness to survive and prosper.

Criminals are often said to live by a code of honour. A governing principle of the code is a criminal should not inform on other criminals (Alder, 1985). Although this prescription lies at the heart of the situation described in the prisoners dilemma, it does not regulate transactions between criminals, or between criminals and the public. There is also evidence to suggest that criminals regularly violate this code of honour when put under pressure by the police (Alder, 1985).

3.5.6 Cross-Cutting Allegiances

Cross-cutting allegiances refer to situations where individuals have loyalties beyond their immediate interest in a cooperation situation (Bates, 1983). Such allegiances include codes of honour, friendship, kinship, and family relations. These loyalties reduce the benefits of cheating by requiring a cheating exchange party to violate the loyalty to cheat. The customary law of exogamy purposefully creates cross-cutting allegiances to encourage stability between vengeance groups (Bates, 1983). Exogamy requires a man to take a wife from outside his vengeance group. The marriage

stabilises the relationships between the two groups by making members of both families related through marriage.

Cross-cutting allegiances are likely to be useful to exchange parties in illicit drug markets because they not only discourage cheating on transactions, they will also improve the security of transactions. The loyalty created by friendships and family relationships will not only discourage cheating on transactions but also reduce the likelihood of betrayal to the police.

The benefits of cross-cutting allegiances in the criminal world explain the family orientation of many criminal organisations, such as the Mafia. Cross-cutting allegiances may also explain the goodwill and "partying" observed in many exchange relationships in illicit drug markets (Alder, 1985; Long, 1988). These are attempts to establish cross-cutting allegiances between exchange parties to reduce the benefits from cheating and improve the security of transactions. To be effective cross-cutting allegiances have to be strong enough to overcome the tangible benefits from cheating or informing.

3.5.7 Ongoing Interaction

When the prisoners dilemma is repeated between the same two players a player can respond to the past choices of their opponent. They can reward their opponents cooperation in the last play of the game by cooperating themselves in the next round of the game, or alternatively they can punish their opponent for cheating in the last round of the game by cheating themselves in future rounds of the game (ie. Tit-for-Tat) (Axelrod, 1981; 1990). Retaliation either denies an opponent the gains from cheating if they continue to cheat in the future, or it inflicts on them the worst pay-out if they decide to begin to cooperate. Retaliation can cause the repeated prisoners dilemma to

break down into a series of mutual cheats causing the gains from cooperation to be lost forever to both players (Axelrod, 1990).

The risk that retaliation for cheating will cause cooperation to collapse forever changes the nature of the prisoners dilemma. The decision to cheat now involves comparing the one-off benefit of cheating against the present value of the future stream of benefits of cooperation forgone (Eggertsson, 1990). Equation (3.1) presents the decision to cheat when future interaction is expected.

$$Bc > \sum_{t=1}^{n} Be^t / (1+r)^t \qquad (3.1)$$

where Bc = benefit of cheating
Be = benefit of cooperation
r = discount rate
n = number of time periods

It generally pays for players to cooperate when future interaction is expected because the series of benefits of future cooperation are usually greater than the one-off benefit of cheating.

Three conditions are required to bring about this general result:

(i) Players must not discount the future too highly. The higher the discount rate (r) the lower will be the present value of the future benefits of cooperation and the more likely it will be rational to cheat. The discount rate is not only used to represent preferences for risk and time value, but also the likelihood the two players will meet again in the future (Axelrod, 1990). If players are unlikely to meet again in the future, the future benefits of cooperation are uncertain and the discount rate will be high.

(ii) The two players must interact with each other indefinitely into the future (Axelrod, 1990). If the game is played only once, there is no future benefits of cooperation to compare with the present benefits of cheating, and so players might as well cheat. Similarly, if the players know they are only going to play the game for a set number of times they will cheat on the last play of the game. If they both know they going to cheat on the last round they might as well cheat on the round before that, and so on. The incentives to cooperate can unravel all the way back to the first play of the game. The assumption of indefinite interaction does not mean interaction must be forever, it merely requires players cannot be sure they are meeting for the last time (Axelrod, 1990).

(iii) The benefits of cheating (Bc) cannot be too high relative to the benefits of cooperation (Be) (Wade, 1987). The larger the benefits of cheating the higher must be the benefits of cooperation to sustain cooperation (North, 1990).

When interaction is ongoing the benefits of future cooperation are received indefinitely into the future. The present value of a infinite series of future benefits of cooperation can be represented by a financial perpetuity, Be/r (Axelrod, 1990). The decision to

cheat now becomes comparing the one-off benefit of cheating with a perpetuity of benefits of cooperation. The decision to cheat when interaction is ongoing is presented by the equation (3.2).

$$Bc < Be / r \qquad (3.2)$$

It generally pays to cooperate when interaction is ongoing because the perpetuity of future benefits of cooperation will usually be greater than the one-off benefit of cheating. The lower the discount rate (r), and the higher the benefits of cooperation (Be) relative to the benefits of cheating (Bc), the more likely individuals will cooperate.

It is reasonable to assume illicit drug consumption will involve ongoing transactions. Illicit drugs are a consumer item. People will buy them again and again to satisfy their long term consumption needs. The euphoric and addictive qualities of illicit drugs will encourage regular consumption. It is also realistic to assume buyers and sellers cannot tell when an exchange relationship will cease. Sellers generally expect buyers to return for future purchases, and buyers generally expect to buy from the same seller in the future.

There is a more serious problem with the application of the ongoing interaction solution to retail illicit drug transactions. A key assumption of the repeated prisoners dilemma is players cannot eliminate their opponent or run away from the interaction (Axelrod, 1990). This prevents players from cheating and exiting the game with their winnings. This assumption does fit many real-world situations. In politics, for example, adversaries such as political parties, nation states, and long serving political

representatives, meet again and again in the future (Axelrod, 1990). The high probability of future interaction can convince political entities to cooperate in the present in the hope of extracting reciprocal behaviour in the future (Axelrod, 1990).

Market relationships, on the other hand, are generally not characterised by stability and longevity. They are much more flexible and short term. The efficiency of the market comes from the ability of buyers to change sellers when performance becomes unacceptable or market conditions change. The ease which exchange parties can change exchange partners is often seen as an important measure of a markets competitiveness. Buyers and sellers in illicit drug markets can cheat an exchange partner and simply avoid dealing with them in the future. Even more seriously, in a competitive market a cheating exchange party can easily begin transacting with a new exchange partner. A cheating exchange party will not only be able to escape with the gains of cheating, they will also not loose any of the future benefits of exchange.[4]

The decision to cooperate now becomes comparing the one-off benefit of cheating plus a perpetuity of benefits of cooperating with a new exchange partner, with the perpetuity of benefits of continuing to cooperate with the existing exchange partner. The decision to cheat in a competitive market is presented in equation (3.3). The benefits of exchange with different exchange partners are assumed to be the same ($Be_2 = Be_2$).

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[4] Others have argued competition can discipline transactions by providing alternative exchange partners (Tullock, 1985; Viktor and Congleton, 1992). This assumes cheating exchange partners can be easily avoided and will eventually find themselves isolated (ie. ostracism through reputation) (Viktor and Congleton, 1992, p.428). If this is not the case abundant alternative exchange partners will only provide the means to cheat and change exchange partners indefinitely. Reputation is limited in illicit drug markets by the need for secrecy and discretion. Drug dealers are likely to value discretion over enthusiastic recommendations. The ability of exchange parties to disseminate information on market participants is limited by the need for secrecy and discretion.

$$Bc + Be_2/r > Be_1/r \qquad (3.3)$$

cheat whenever $Bc > 0$

where Be_1 = benefits of exchange with existing exchange partner

Be_2 = benefits of exchange with new exchange partner

The benefits of exchange with an existing exchange partner (Be_1) are cancelled out by the benefits of exchange with a new exchange (Be_2). The decision rule can therefore be simplified to cheat whenever the benefits of cheating are positive ($Bc > 0$). When players are able to switch opponents easily the incentives to cooperate created by ongoing interaction break down. The game reverts back to the original prisoners dilemma.

3.5.8 Dense Social Interaction

When social interaction is dense cheating is more detectable (Wade, 1985; North, 1987; 1989; 1990). There is also greater public information about the integrity of individuals and the quality of products for sale (Geertz, 1978; 1979). Individuals develop public reputations based on their repeated interactions with the same small group of people. These public reputations can be used to select reliable trading partners and avoid unreliable ones.

The incentives to personalise exchange relationships in the illicit drugs market (see cross-cutting allegiances) can create conditions of dense social interaction. In the

absence of legal market institutions such as advertising and marketing in general, reputation is an important way to communicate information about the integrity of sellers and the quality of products.

Impersonal city environments will erode the density of social interaction and consequently the effectiveness of reputation in the market. The drive-by markets for cocaine in many large cities in the United States, and the cannabis "tinny houses"[5] in New Zealand, resemble impersonal rather than personal markets. The general secrecy of the market will also reduce the effectiveness of reputation. A drug dealer may want a good reputation, but only amongst a very select group of people (Moore, 1977; Long, 1988). Too much of a public reputation can lead to arrest. Drug dealers are likely to value discretion above enthusiastic recommendations. The ability of exchange parties to disseminate information on market participants is limited by the need for secrecy and discretion.

3.5.9 Conditional Cooperation

Conditional cooperation refers to the ability to find out what your opponent has chosen to do before the pay-off from the game is received. Conditional cooperation essentially eliminates the cheating pay-off. Opponents will simply respond to cheating by cheating themselves.

Conditional cooperation is most easily achieved when individuals are able to observe each others performance (Wade, 1987). The ability to observe cheating is a function of the geography of the resource, and the number of people involved in an agreement

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[5] "Tinny houses" are houses where "tinnies" or "bullets" of cannabis are sold indiscriminately to all comers. They are essentially retail outlets for cannabis. The only difference from a corner-shop is the identity of the seller is often concealed from the buyer by a wall which allows the transfer of money and drugs. Gangs often run tinny houses, which are usually rental properties. Tinny houses are often associated with sales to school children.

(Wade, 1987). A complication with market exchange is that unlike many forms of social interaction it is generally a fleeting event, often conducted between strangers.

Conditional cooperation can also be achieved if individuals are able to measure the value of goods or performance before agreeing on the terms of exchange. This can be brought about with physical inspection of a product, or sampling of a product, before purchase (North, 1990). Exchange parties may have access to specialised measurement technology that allows them to measure the valuable attributes of a product before purchase (North, 1990). In advanced economies, exchange parties can draw on standardised packaging, product labelling, and advertising, to gain information on the value of a product (North, 1990).

The enforcement of prohibition and the physical characteristics of illicit drugs generally prevent the establishment of conditional exchange. The illegality of the drugs market prevents the emergence of advanced market institutions such as product labelling and advertising.[6] Illegality also restricts the development and availability of measurement technology. Finally, the physical characteristics of illicit drugs make both physical inspection and product sampling problematic.

Prohibition restricts the development and availability of consumer technology to measure the value of illicit drugs. Drug prohibition statutes often make it an offence to possess specialist equipment related to the use or sale of illicit drugs, such as weighing scales. Section 13(1) of the *Misuse of Drugs Act 1975*, states:

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[6] Goldstein(1989) reports heroin is often sold under distinctive "brand names" in New York City but brands are frequently fraudulently copied by competitors.

"Every person commits an offence against this Act who -
(a) Has in that person's possession any pipe or other utensil (not being a needle or syringe) for the purpose of the commission of an offence against this Act."

Consequently, there is no legal market for a simple consumer test of cocaine or heroin quality. The knowledge to carry out such tests is only accessible to specialist professionals, such as chemists. These people would be risky to approach for advice.

The tests which are used in the illicit drugs market are the product of folk myth or amateur science rather than rigorous scientific method (Long, 1988). Alder (1985) describes several technics used to test the purity of cocaine:

"Dealers used various testing methods to determine their product's purity. Some dealers placed a small amount of cocaine on a piece of aluminium foil and lit a fire underneath, watching to see the amount and color of the residue which remained after the cocaine boiled away. Other immersed some cocaine in a solution of either Chlorox or methyl alcohol and waited to see how much dissolved. While cocaine was soluble, some of the cuts remained, either floating or sinking to the bottom. These tests were all rather haphazard and unscientific." (p.50)

The physical characteristics of illicit drugs limit the effectiveness of physical inspection. Many illicit drugs are chemical concentrates which are sold as everyday pills and powders (see New Zealand Customs Department, 1980; Kuhn *et al.*, 1998). They are often difficult to distinguish from legal medicines and common household products. The New Zealand Customs Department (1980) describes opium as:

"Similar to a soft tar or plasticine, or can be very sticky similar to Bovril, Marmite, or malt extract."

Cocaine is described as:

"A white crystalline powder resembling Epsom Salts." (New Zealand Customs Department, 1980)

Moore (1977) explains heroin users sometimes,

"...purchase a white powder in a glassine envelope and find it is flour or sugar." (p.51)

A recent article in TIME on the Australian heroin market reported heroin users are sometimes sold crushed aspirin rather than heroin (Collingwood, 1999).

The size and physical appearance of illicit drugs often bears little relationship to their quality and subsequent value. For example L.S.D. is described as a,

"..colourless, tasteless, and odourless liquid...used in minute quantities....usually carried and used by impregnating an absorbent material such as sugar cubes, blotting paper, paper tissues, or clothing....." (New Zealand Customs Department, 1980)

Heroin and cocaine are diluted with an additive to make them safe for human consumption and to increase dealer's profits (New Zealand Customs Department, 1980; Moore, 1977; Alder, 1985; Long, 1988; Kuhn *et al.*, 1998). The value of these drugs is significantly affected by the extent of dilution and the type of additive used.[7] Dealers have been known to use unsafe additives or dilute drugs to the extent they are worthless (Alder, 1985).

Specific physical features of illicit drugs are sometimes said to indicate high quality, such as many "flower heads" in the case of cannabis, or the presence of many "rocks" in the case of cocaine (Alder, 1985; Long, 1988). The reliability of these physical

[7] Acording to the New Zealand Customs Department (1980) heroin is cut with caffine, glucose, and milk powder, to be sold at a street level purity of 10-20 percent. Long (1988) explains cocaine is most commonly cut with Manitol (a mild laxative) or Inositol (pure vitamin B-12). Cutting cocaine with Lidocaine (an anesthetic) will improve the cocaine "rush."

features remain unproven. They have emerged as part of the folklore of the market rather than from rigorous scientific study. High rock content in cocaine is meant to suggest the product has not been heavily "cut" (Long, 1988). Long (1988) notes although high rock content in cocaine is widely held to denote high quality, he has bought cocaine that was nearly all powder which was as good quality as cocaine of high rock content. Long (1988) also provides instructions of how to artificially increase the rock content of cocaine by compacting it in a homemade compression chamber.

Sampling illicit drugs before purchase will often not be practical. Many illicit drugs have debilitating effects which will impede the competent completion of the transaction and any subsequent activity (eg. driving, returning to work, etc). An exchange party may simply not want to become intoxicated at the time of transacting. There may also be a strict time constraint on the completion of a transaction. Drug dealers generally aim to complete transactions in the shortest possible time to avoid the risk of detection.

Michaels (1987) classifies heroin as an "experience" good, as opposed to a "search" good, using terminology developed by Nelson (1970; 1974). The quality of an experience good cannot be determined by physical inspection prior to purchase. Nelson's (1970; 1974) example of an experience good is the taste of a brand of canned tuna fish. Search goods, on the other hand, can be determined by physical inspection. The example used by Nelson (1970; 1974) is the style of a dress.

Although exchange parties will generally not be able to detect cheating before a transaction is complete, they will be able to detect cheating after the transaction is complete. Assault, robbery, and theft, have very public consequences. A completely fraudulent substance is easy to detect because it produces no euphoria.

Consuming a drug after purchase will provide a rough guide to quality. The accuracy of consumption as a measure of drug quality will improve with experience.

3.6 Conclusion

The decision to cheat on a retail illicit drug transaction can initially be modelled as a two person prisoners dilemma game. The prisoners dilemma is particularly relevant to illicit drug transactions because it depicts a situation where two people know they can both benefit from cooperation, but each knows they do even better if they choose to cheat while their partner cooperates. The dominant strategy in the prisoners dilemma is to cheat. This result is brought about by two assumptions: (i) players are not permitted to communicate with each other before deciding what to do, and (ii) players only choose once before receiving the pay-outs (Wade, 1987).

The discussion of the possibly solutions to the prisoners dilemma game confirm many of the fundamental conditions of the prisoners dilemma apply to retail illicit drug transactions. There is no third party enforcement of any type, no established system of compensation and arbitration, and exchange parties are strongly motivated by self-interest. The apparent professional advantage drug dealers have with physical violence would seem to further create the conditions for cheating.

Some of the solutions to the prisoners dilemma are only relevant to retail illicit drug transactions in certain circumstances. Cross-cutting allegiances would be relevant when transactions are conducted between close friends and family members. Dense social interaction would be relevant if the illicit drugs market is local and stable. The effectiveness of public reputation is reduced by the secrecy and discretion of exchange parties. Credible physical retaliation would be relevant if exchange parties had good information about each others ability with violence. The vengeance ethic would be a

factor if a transaction is made from a gang member. Conditional cooperation would be relevant if the physical characteristics of a drug are conducive to physical inspection, product sampling is practical, or measurement technology is readily available. Discussion of these solutions suggest they are the exception rather than the general conditions of the retail illicit drug market.[8] The general constraints of retail illicit drug transactions can be summarised as, no third party enforcement, no conditional cooperation, and ongoing interaction. Exchange parties can be accurately described as self interested with guile. Exchange parties are only able to detect cheating after a transaction is complete (ie. illicit drugs are "experience" goods).

Ongoing interaction suggested a possible means to avoid prisoners dilemma outcomes. Illicit drug consumption was held to involve ongoing transactions because illicit drugs were a consumer item, and their euphoric and addictive qualities encouraged repeat consumption. When interaction is ongoing players can punish cheating by cheating themselves in all future interactions (Axelrod, 1981; 1990). The decision to cheat when interaction is ongoing is presented in equation (3.2).

$$Bc < Be / r \qquad (3.2)$$

It generally pays to cooperate when interaction is ongoing because the perpetuity from future cooperation will usually be greater than the one-off benefit of cheating.

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[8] The absence of many of the traditional institutions of personal exchange (ie. stable local relationships, cross-cutting allegiances, inspection, sampling, measurement technology, social conditioning) distinguishes exchange in the illicit drugs market from the general case of personal exchange in many stateless economies. These additional constraints make transactions in the illicit drugs market resemble the prisoners dilemma even more than normal stateless transactions.

The "ongoing interaction" solution was rejected in the case of competitive markets because exchange parties had the ability to easily switch exchange partners. An exchange party could cheat, and then simply begin transacting with new exchange partner. The decision to cheat in a competitive market is presented in equation (3.3).

$$Bc + Be_2/r > Be_1/r \qquad (3.3)$$

$$\text{cheat whenever } Bc > 0$$

Equation (3.3) indicates an exchange party should cheat whenever the benefits from cheating are positive.

The rejection of the "ongoing interaction" solution to the reliability of illicit drug transactions is based on an idealised view of the market. Exchange parties are assumed to be able to costlessly, and instantaneously, switch exchange partners. Economists have come to realise there are real costs associated with completing exchange successfully (Coase, 1960). These "transaction costs" reduce the benefits of exchange, and in many instances are so high that they prevent any exchange from taking place. Transaction costs will make it costly to change exchange partners. A new exchange partner must be found and a new exchange relationship established. The transaction costs associated with finding a new exchange partner will reduce the benefits of cheating a current exchange partner. Conceivably, if transaction costs were high enough they could make cheating unprofitable. The next step is to identify precisely what transaction costs are associated with switching exchange partners, and the level

of these transaction costs in the retail illicit drugs market. This is the aim of the next chapter.

4. A Transaction Cost Model of the Reliability of Retail Illicit Drug Transactions

4.1 Introduction

Chapter 3 identified the general constraints of retail illicit drug transactions, no third party enforcement, no conditional cooperation, and ongoing interaction. Exchange parties can be accurately described as self-interested. They share no strong social perscriptions against cheating. The effectiveness of reputation as a means to avoid unreliable exchange partners is undermined by the secrecy and discretion of participants. Exchange parties are only able to detect cheating after a transaction is complete (ie. illicit drugs are "experience" goods).

Ongoing interaction suggested a possible mechanism to encourage exchange parties to voluntarily honour the terms of transactions. When interaction is ongoing between the same two individuals the punishment for cheating is the loss of the benefits from cooperation in all future meetings (Axelrod, 1981; 1990).

The "ongoing solution" was rejected in the case of competitive markets because exchange parties are able to avoid the punishment for cheating by switching exchange partners. In the conclusion to the chapter it was recognised this objection may change if the transaction costs associated with switching exchange partners were high enough.

This chapter defines search costs in competitive markets, and discusses the nature of search in the retail illicit drugs market. Search costs are then included in the decision to cheat in a competitive market. Two decision making rules are developed to explain all the cheating between exchange parties in retail illicit drug transactions.

4.2 The Definition of Transaction Costs

There is no precise definition of transaction costs in the new institutional literature (Eggertsson, 1990). A broad definition of transaction costs which is often used is all the information costs associated with carrying out exchange (North, 1990; Eggertsson, 1990). Barzel (1989) defines transaction costs as, "the costs associated with the transfer, capture, and protection of rights." (p.2) Williamson (1985) explains transaction costs as the "ex ante costs" of arranging a contract, and the "ex post" costs of monitoring and enforcing a contract. (p. 20-21)

Remarkably, given the central role transaction costs play in new institutional economics, few writers have attempted a more precise definition of the term. The "catch all" use of the term has been a source of criticism of the new institutional methodology (Dahlman, 1979; Fischer, 1977; Hodgson, 1988). Hodgson (1988) is particularly scathing of Williamson in this respect :

> "..Williamson has failed to provide an adequate definition of transaction costs themselves. It is not that he has failed to recognize the problem. In one article it is noted that 'the concept wants for definition' (1979, p.233) but he then proceeds not to define the term but to list a set of 'factors' which relate to the mode of analysis. The nearest that Williamson actually gets to a definition in his latest major work is by quoting Kenneth Arrow's vague characterization of transaction costs as the 'costs of running the economic system' (Arrow, 1969, p.48). Williamson (1985,p.19) then follows this with an analogy: 'Transaction costs are the economic equivalent of friction in physical systems.' Whatever the value of this analogy, it is not a definition. The failure to provide a definition of such a crucial term is symptomatic of the lack of precision in much of Williamson's work." (p.200)

Carl Dahlman's (1979) classification of transaction costs remains an enduring contribution to the understanding of the term. He begins with the description of transaction costs provided by the originator of the concept, Ronald Coase (1960).

Coase (1937; 1960) first introduced the concept of transaction costs in his seminal discussion of social cost:

"The argument has proceeded up to this point on the assumption that there were no costs involved in carrying out market transactions. This is, of course, a very unrealistic assumption. In order to carry out a market transaction it is necessary to discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on." (p.15)

Dahlman (1979) develops this description into the following classification of transaction costs: search and information costs, bargaining and decision costs, and policing and enforcement costs. Search and information costs are the time and resources expended finding a new exchange partner. Bargaining and decision costs are the costs of conveying information about an exchange opportunity to an exchange partner, and the costs associated with coming to an agreement concerning the terms of exchange. Policing and enforcement costs are the costs of monitoring the performance of exchange partners, and ensuring terms are fulfilled.

Transaction costs have been conceptualised mathematically as both variable and fixed costs (Dahlman, 1979). As a variable cost, the transaction cost varies in relation to the number of transactions completed, similar to a transportation cost. As a fixed cost, the transaction cost is viewed as a set-up cost of exchange, which is independent of the number of transactions completed. Dahlman's (1979) classification of transaction costs suggests transaction costs are a mix of fixed and variable costs. Search costs are the fixed set-up costs of an exchange relationship while bargaining and enforcement costs are variable costs incurred with every transaction.

Bargaining and enforcement costs will be incurred regardless of which exchange partner is dealt with.[1] Search costs, on the other hand, are only incurred when an exchange party changes exchange partners. Search costs are therefore the transaction costs associated with switching exchange partners. Search costs exist because of imperfect information about the existence and location of exchange partners and exchange opportunities (Dahlman, 1979).

4.3 Some Characteristics of Search Costs

Search costs are a neglected area in property rights economics. Discussions of transaction costs in the new institutional literature often only refer to measurement costs, bargaining costs, and enforcement costs (see Williamson, 1975; 1985; North, 1981; 1984; 1987; 1989; 1990; Barzel, 1989). For example, in a recent summary of the transaction cost theory of exchange, North(1990) specifies the components of transaction costs:

"The costliness of information is the key to the costs of transacting, which consist of *the costs of measuring the valuable attributes* of what is being exchanged and *the costs of protecting rights and policing and enforcing agreements.*" (my italics, p.27)

A possibly explanation for the neglect of search costs can be found in the institutional context in which theory has been developed. It is useful to employ the classification of exchange developed by North (1984; 1987; 1989; 1990) for this explanation.

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[1] Bargaining and enforcement costs may tend to fall as more and more transactions are completed with the same exchange partner. Changing exchange partners therefore may mean incurring higher levels of variable transaction costs. This is difficult to verify. Geertz (1978; 1979) for example, explains intensive bargaining continues even amongst established exchange parties in the bazaar.

The vast majority of the theory of transaction costs has been developed from work in advanced economies. These economies are characterised by impersonal exchange and stable third party enforcement (see Williamson, 1975; 1985; Barzel, 1989; North 1990; Eggertsson, 1990). A lesser source of theory has been primitive economies. These social systems are characterised by limited but highly personal exchange (see, Bates, 1984; Posner, 1980). In the case of impersonal exchange with stable third party enforcement, search costs are potential high, but are actually fairly low. The state and private enterprise have developed an array of market institutions to assist exchange parties with finding products and finding exchange partners. Market institutions such as, advertising, marketing, information directories, prominent store locations, and media promotion. Search costs in primitive economies are also low but for different reasons. Social interaction is so dense, and exchange activity is so limited, that search costs are naturally low in primitive economies.

An important exception to the general neglect of search costs is Clifford Geertz's (1978; 1979) study of the Middle Eastern bazaar. The bazaar represents a third type of exchange, impersonal exchange without third party enforcement (North, 1984; 1987; 1990). The absence of stable third party enforcement means there is none of the specialist information infrastructure of an advanced market economy. Exchange is free flowing and intensive, and markets are impersonal, but there is real uncertainty about the location of sellers and the nature of exchange opportunities (Geertz, 1978). The informational deficiencies of the bazaar have lead Geertz (1978; 1979) to investigate the implications of high search costs in a competitive market. Geertz (1978) explains:

"...in the bazaar information is poor, scarce, maldistributed, inefficiently communicated and intensely valued. Neither the rich concreteness or reliable knowledge that the ritualised character of nonmarket economies makes possible, nor the elaborate mechanisms for information generation and transfer upon which industrial ones depend, are found in the bazaar: neither ceremonial distribution nor advertising; neither prescribed exchange partners nor product standardization. The level of ignorance about everything from product quality and going prices to market possibilities and production costs is very high, and much of the way in which the bazaar functions can be interpreted as an attempt to reduce such ignorance." (p.29)

"The search for information - laborious, uncertain, complex, and irregular - is the central experience of life in the bazaar. Every aspect of the bazaar economy reflects the fact that the primary problem facing its participants (that is, 'bazaaris') is not balancing the options but finding out what they are." (Geertz, 1978, p. 30)

Search costs include actual expenditures in the search for a new exchange partner, and the time taken to find an exchange partner (Dahlman, 1979). A fundamental determinant of search costs is the size of the market. The larger the market the easier it is to find exchange partners. Another important determinant of search costs is the visibility of exchange opportunities. The visibility of market opportunities can be increased with advertising, marketing in general, prominent store locations, information directories, and media promotion.

Expenditures on search can include such diverse costs as buying a newspaper or specialised advertisement publication, purchasing a mailing list, travelling to view products, or consulting a broker in the market, such as a real estate agent or sharebroker. A significant cost of search can be the time spent in the search process. Effective search requires a survey of the market as well the more intensive evaluation of initially attractive offers. An exchange party may have to locate and evaluate a number of exchange opportunities before they are able to make an informed decision.

Search costs explain why exchange parties generally prefer to return to an established exchange partner rather than search throughout the market. Returning to an established exchange partner significantly reduces search costs. Lower transaction costs increase the returns from exchange and allow more mutually beneficial exchange to take place (North, 1990). In the bazaar, search costs are so high that the tendency to return to the same exchange partner, or "clientalisation," is an institutionalised feature of the market (Geertz, 1978; 1979). Clientalisation is a conscious strategy to make the costs of search manageable (Geertz, 1978). Geertz (1978) explains:

"Clientalisation is the tendency, marked in Sefrou, for repetitive purchasers of particular goods and services to establish continuing relationships with particular purveyors of them, rather than search widely through the market at each occasion." (p.30)

Clientalisation creates expectations about the nature of exchange:

"The use of repetitive exchange between acquainted partners to limit the costs of search is a practical consequence of the overall institutional structure of the bazaar and an element within that structure." (Geertz, 1978, p. 30)

The ability to repeatedly return to an established exchange partner presupposes that previous transactions were completed to each others satisfaction, and no cheating occurred.

4.4. Search in the Retail Illicit Drugs Market

4.4.1 Introduction

A number of characteristics of the retail illicit drugs market suggest search in the market will be costly. Exchange parties naturally endeavour to keep their identities secret to avoid arrest and public embarrassment. There is no advertising, public directories, or prominent store locations, to assist exchange parties with finding exchange opportunities. Search can also result in arrest if the wrong person is approached, or an exchange party inadvertently begins transacting with an undercover police agent. This section describes the process of search in the market as a precursor to including search costs in the decision to cheat on a transaction.

4.4.2 The Size of the Market

A fundamental determinant of search costs in a market is the size of the market. The size of illicit drug markets vary considerable with location and drug type. Cities will generally have larger drug using populations than rural areas, and the 'softer' drugs such as cannabis, will generally be more popular than 'harder' drugs such as heroin and cocaine (Hamowy, 1987; Black and Casswell, 1993; Field and Casswell, 1999a; Field and Casswell, 1999b). Dealers of 'soft' drugs can provide contacts in the search for 'hard' drugs (Long, 1988).

Although illicit drug users will be a minority in most societies, they may be a significant minority, particularly amongst young adults (Black and Casswell, 1993; Field and Casswell, 1999a; Field and Casswell, 1999b). Long (1988) claims in the United States, "..unless you are living in a hick town, at least a third of the people you already know are using some type of illicit drug." (Long, 1988). According to the

United States Department of Justice, almost a third of Americans 12 years and older have used cannabis at least once, and more than 10% have tried cocaine (Miron and Zwiebel, 1995). In a recent survey of drug use in New Zealand, 52% of people had tried cannabis, 12% had tried LSD, and 4% had tried cocaine (Field and Casswell, 1999b). Sixty-seven percent of New Zealand men aged 20-24 years had tried cannabis, 13% of men 18-24 had tried LSD, 12% of men aged 18-19 years had tried stimulants (Field and Casswell, 1999a; Field and Casswell, 1999b).

Caution is required when using general drug statistics to estimate the size of an illicit drug market. It is important to distinguish between those who have "tried" a drug from those who are "current" users. For example, while 52% of New Zealanders had tried cannabis only 15% were current users (ie. used in last 12 months and had not stopped) (Field and Casswell, 1999a; Field and Casswell, 1999b). Similarly, while 12% of New Zealanders had tried LSD, only 3% were current users (Field and Casswell, 1999b). Although 4% of New Zealanders had tried cocaine, only 0.8% were current users (Field and Casswell, 1999b).

In addition, not all current illicit drug users buy their drugs from the illicit market. The free sharing of drugs is a common behaviour amongst illicit drug users (Black and Casswell, 1993; Field and Casswell, 1999a; Alder, 1985; Te Runanga, 1995). Many illicit drug users receive their drugs for free at social events, or through personal relationships, such as a spouse or family member (Te Runanga, 1995; Black and Casswell, 1993; Field and Casswell, 1999a). The actual size of an illicit drugs market is determined by the number of current users who buy their drugs in the illicit market.

4.4.3 The Consequences of Secrecy

The illegality of the drugs market means exchange parties cannot promote their identities to the general public. Drug dealers cannot advertise through the media, trade from prominent store locations, advertise their business and phone number in telecommunication directories, or maintain an accessible public profile. Drug users are reluctant to reveal their consumer preferences for illicit drugs for fear of arrest and public embarrassment. Soliciting customers from the general public is a very risky marketing strategy. A drug dealer may inadvertently approach an off-duty police officer, or someone opposed to drugs enough to report the incident to the police (Long, 1988). Contrary to the popular image of the drug dealer 'pushing' drugs on passers-by, in reality drug dealing appears to be a largely passive activity, the drug dealer responds to the approaches of buyers (Moore, 1977; Michaels, 1989).

Locating a drug dealer is an exercise in social networking (Moore, 1977; Alder, 1985; Long, 1988; Reuter and Haaga, 1989; Michaels, 1989). A prospective buyer must approach people who are likely to sell drugs or have contacts in the market. This is not without legal risk (Long, 1988). Some people may be offended by such an inquiry, a few may even report the incident to the police. Others may have some relationship to a police officer, such as friendship or family relationship. Enquires need to be selective and discreet to avoid the attention of the police. The "asking around" process is slow and inexact, it may have to be repeated many times before a successful contact is made. Long (1988) suggests initially approaching alcohol drinkers between the ages of 20-25. He advises:

"Someone you know is either using drugs or knows someone who is. Stay among the people you can talk openly with, if possible, and be patient...Patience at this point in the game is directly proportionate to wisdom." (p.6)

"Don't be pushy and don't try to rush the process." (Long, 1988, p.3)

Reuter and Haaga (1989) found the "bar-scene" was a common place to meet drug connections:

"People who work in bars are professionally convivial and spend a great deal of time around other people with low inhibitions against substance abuse. They get to know small-time dealers and observe them as they evaluate and approach customers." (p.36)

Other sources of drug connections include criminal associations, associations made while in prison, and family relationships (Reuter and Haaga, 1989). Many connections were made purely by chance:

"As was true for many of our respondents, there was a large amount of chance in these meetings. One Louisiana man, for example, described how he met his most significant source when he helped the latter extricate himself from a fight in a bar our respondent managed." (Reuter and Haaga, 1989, p.36)

Information about drug dealers can be gained by socialising in places where drug users are known to socialise. Moore (1977) explains:

"A Hayes-Bickford cafeteria becomes the heroin industry's analogue to the stock market's tickertape and big board." (p.50)

"An early personal encounter with the world of heroin addicts involved 'hanging out' in a Hayes-Bickford cafeteria in Brooklyn and listening to addicts talk about places to 'score'." (Moore, 1977, footnote eee, p.50)

Moore (1977) also reports the existence of "touts" or "bag followers" in the heroin market, who provide information on the location of dealers and exchange opportunities.

4.4.4 The Screening of Exchange Partners

Identifying a drug dealer does not automatically ensure exchange will proceed. Drug dealers will screen prospective customers to avoid undercover police agents, drug thieves, and indiscreet customers (Moore, 1977; Alder, 1985; Long, 1988; Reuter and Haaga, 1989). Undercover police agents pose as drug users, arresting the dealer after the transaction is complete (Alder, 1985). Drug thieves pose as legitimate customers but either take drugs without paying for them, or rob the dealer of drugs or drug proceeds. Indiscreet customers will increase the dealers risk of arrest by disclosing the dealers identity to a large number of people, or by drawing attention to themselves through indiscreet drug induced behaviour (Moore, 1977).

Correctly identifying an undercover police agent is a difficult task since undercover agents are dedicated to resembling authentic exchange parties as much as possible. Long (1988) explains:

"Pigs [the Police] have taken on a new look in the past decade, and they have taken on a new style and a new system. Vice cops will not only sell you drugs, they will snort your Cocaine with you, smoke your pot [cannabis] with you, and bang [have sex with] the same broads with you, too. They wear clothes that normal people wear now, instead of $40 leisure suits, and their barbering will be consistent with current trends." (my explanation, p.62-63)

Drug dealers look for personal references from trusted associates, knowledge of drug jargon, and evidence of drug use, to screen out undercover agents (Moore, 1977). Alder (1985) describes the security precautions taken by the drug dealers she studied:

"Southwest County drug traffickers followed widely variant criteria for evaluating new customers. The most broadly followed precaution was a prohibition against dealing with strangers; only the least reputable dealers risked engaging in a business transaction with a completely unknown person. More careful dealers regarded such dealers as security risks themselves.....Normally the minimum security precaution followed was to sell only to those individuals who were guaranteed by friends. Here, the guarantor had to be someone they knew well and trusted. More cautious individuals sold only to their friends directly, refusing to do business with anyone else.....These drug traffickers tried to work with relatively few buyers. They did not entirely rule out new connections, but tried to keep the number of their business relationships to a minimum. Finally some drug traffickers only worked with people they had encountered in the past. These highly cautious individuals avoided forming new distribution routes altogether (once their steady circle was established), preferring to restrict their dealing to those who had already been proven reliable." (p. 113-114)

The imprecision of the screening process also means there is a risk a legitimate buyer can be wrongly identified as an unreliable exchange partner and refused exchange (Moore, 1977). First-time buyers are particularly disadvantaged in this way because they have no associations in the market, little knowledge of jargon, and no physical evidence of drug use (Moore, 1977).

Buyers will also employ a screening process when selecting a seller. Police pose as drug dealers as well, arresting those who buy drugs from them after a transaction is completed. Buyers also face the risk of victimisation by their dealer, and discovery if their seller is indiscreet.

4.4.5 The Role of Reputation

In a personal market where exchange opportunities are identified through social networking, reputation is an important source of information about potential exchange partners (Alder 1985). Reputation is a way to communicate information about the reliability of exchange parties, and the quality of products, to potential exchange partners through the social network. This information can be positive or negative. The power of reputation is one piece of information can be quickly disseminated to many potential exchange partners. A good reputation can be a valuable business asset in the market, and conversely a bad reputation can be a serious impediment to business in the market.

Studies of drug dealers acknowledge the important role reputation plays in the market (Alder, 1985; Long, 1988). Long (1988) advises:

"When you have found a better source and the product you are getting improves, do not increase the price and do not increase the cut you put on the product. Allow the improvement to pass onto your clients. The better the product, the more of it they will buy and sell for you, and that means coming back to you sooner for another buy. Word spreads fast when a good batch of any kind of drug hits the streets, and your quality improvement will be known quickly amongst your constituents." (p.22)

Alder (1985) explains:

"One of the first requirements for success, whether in drug trafficking, business enterprise broadly, or any life undertaking, is the establishment of a good personal reputation. To make it in the drug world, dealers and smugglers had to generate trust and likeability. The most important character trait in this regard was *integrity*. According to others, quality dealers were honest and fair in business transactions, gave exact "counts" (full weight values), and made fairly accurate estimations of the quality of their product." (italics in original, p.100)

Alder (1985) continues:

"A second character trait which promoted a good reputation was *generosity*. Dealers and smugglers liked doing business with righteous associates. By allowing people more time when they occasionally could not repay a front, or throwing in extra bits of drugs for their customer's personal use, or offering the loan of certain possessions....dealers built up goodwill with their colleagues in the community." (italics in original, p.102)

Deceitful and greedy dealers develop bad reputations which made it even more difficult for them to locate quality product and willing buyers. Exchange parties refused to do business with exchange partners who had bad reputations. Alder (1985) illustrates the consequences of a bad reputation using one of her subjects as an example:

"As more and more people received bad deals from Fred or were inadvertently ripped off by the failure of Fred's customers to honor their debts, he was cut off by one smuggler and dealer after another. Without his even realising it, his reputation grew so bad that when his wife divorced him and started dealing on her own, she reverted to her maiden name to avoid any association with him." (p.101)

In a market where search costs are high, refusing to do business with a person imposes significant additional costs to exchange. A bad reputation can significantly increase the cost of finding an exchange partner by convincing a large number of the people in the local market not to transact with a person. Alder (1985) explains:

".....to ostracize offenders and refuse to do any further business with them....was a powerful sanction, especially in highly integrated dealing circles where a blackball from one member could cause all other members to shun an associate." (p.106)

Alder (1985) concludes:

"Dealers could not afford to rip off or burn people in the drug community too often or they found themselves out of business, or at best only dealing with losers." (p.121)

4.4.6 Buyer-Seller Relationships

Exchange relationships in illicit drug markets are often characterised by stable long term arrangements (Reuter and Haaga, 1989; Moore, 1977; Michaels, 1987). Exchange parties restrict the number of exchange partners they deal with to minimise the cost of search and the risk of arrest. Moore's (1977) survey of anecdotal accounts of the heroin market revealed dealers sold to between 6 and 10 buyers only. Michaels (1989) explains:

"The current [Heroin] market is...characterised by highly personalized trading relationships that are formed only after large amounts of search." (my explanation, p.298)

Reuter and Haaga (1989) describe the dynamic of exchange relationships in the cocaine market:

"The successful arrangements described by several of our respondents can best be considered as stable supplier-customer relationships. They were held together by considerations of long-term mutual benefit; neither side would press its advantage in negotiating a single transaction to the point where the long term relationship was destroyed.....The prudent supplier does not charge as much as the market would bear, because he *does not want to incur the risks involved in looking around for the highest-paying customers.* Nor does he dilute his product as much as he feels he could without detection, again because he wants to encourage loyalty among reliable group of purchasers. Both parties want to keep transactions simple and quick." (my italics, p.49)

The personal exchange relationships reported in illicit drug markets are consistent with what Geertz (1978; 1979) found in the Middle Eastern bazaar.

4.5 Search Costs and the Decision to Cheat on a Retail Illicit Drug Transaction

The cost of search must be included in the decision to cheat on a retail illicit drug transaction. Equation (3.3) is the decision to cheat in a competitive market developed in Chapter 3. The one-off benefit of cheating has been converted into an expected one-off benefit of cheating by including a probability of successful cheating.

$$p.(Bc) + Be_2 / r > Be_1 / r \qquad (3.3)$$

where

Bc = the benefit of cheating

Be_1 = the benefit of exchange with existing exchange partner

Be_2 = the benefit of exchange with new exchange partner

r = the discount rate

p = the probability of successful cheating

Search costs will reduce the returns from cheating. Equation (4.1) subtracts the search costs from the expected one-off benefit of cheating.

$$p.(Bc) - S + Be_2/r > Be_1/r \qquad (4.1)$$

S = search costs

Again, the benefits of exchange with different exchange partners are assumed to be the same ($Be_2 = Be_2$). The benefits of exchange with an existing exchange partner (Be_1) are cancelled out by the benefits of exchange with a new exchange (Be_2). Consequently, equation (4.1) can be simplified into equation (4.2).

$$p.(Bc) > S \qquad (4.2)$$

Equation (4.2) indicates an exchange party should cheat in a competitive market if the expected one-off benefit from cheating is greater than the search costs of finding a new exchange partner.

The discussion of search in the illicit drugs markets indicated a number of variables make up search costs. They include financial expenditures on search, the cost of the time taken to find a new exchange partner, the expected legal penalty of search, and expected losses from victimisation during search. The cost of the time taken to find a

new exchange partner can be represented by the present value of the stream of future exchange forgone during the search period. A reputation for cheating will increase the losses from exchange forgone by increasing the time it takes to find a new exchange partner. The expected legal penalty of search is equal to the extra risk of arrest during search multiplied by the monetary equivalent of the disutility of the penalty for a drug offence. The expected losses from victimisation during search is equal to the extra risk of victimisation during search multiplied by the value of property lost from cheating. The value of the property lost during cheating is a function of the type of cheating carried out and the value of the property involved.

The four variables for search costs can be substituted into equation (4.2) to obtain (4.3).

$$p.(Bc) > Sx + \sum_{t=1}^{n} Be^{t} / (1+r)^{t} + q.(U) + v.(T) \qquad (4.3)$$

where

Sx = search expenditures

n = the number of periods before a new exchange partner is found

q = the extra risk of arrest during search

U = the disutility of the legal penalty for a drug offence

v = the extra risk of victimisation during search

T = the value of property lost from cheating

Everything else remaining equal, cheating is less likely:

(i) the higher the expenditures on search (Sx)

(ii) the higher the extra risk of arrest during search (q)

(iii) the higher the monetary value of the disutility of the penalty for a drug offence (U)

(iv) the higher the extra risk of victimisation during search (v)

(v) the higher the value of property lost from cheating (T)

(vi) the higher the benefits of exchange (Be)

(vii) the lower the discount rate (r)

(viii) the longer it takes to find a new exchange partner (n)

(ix) the lower the one-off benefit of cheating (Bc)

(ii) the lower the probability of successful cheating (p)

4.6 Search Costs and the Decision to Quit an Exchange Relationship

The decision to cheat developed in Chapter 3 assumes a victim of cheating will refuse further exchange with a cheating exchange partner. The presence of search costs makes this decision costly. The victim who quits an exchange relationship after cheating will also have to find a new exchange partner. The victim will be faced with search

expenditures, the loss of exchange during the search period, the expected legal penalty of search, and the expected losses from victimisation during search.

In these circumstances a victim of cheating should persist with a cheating exchange partner if the benefits from continuing to transact with the cheating exchange partner, less the losses from ongoing cheating, are greater than the benefits from transacting with a new exchange partner, less search costs. Ongoing losses from cheating include the losses already incurred in the present, plus anticipated losses from future cheating. These losses can be represented by the perpetuity, Cc / r.

Equation (5.1) presents the decision to continue to transact with a cheating exchange partner.

$$Be_2 / r - S < Be_1 / r - Cc / r \qquad (5.1)$$

where

Cc = costs of cheating

The benefits of exchange with an existing exchange partner (Be_1) are cancelled out by the benefits of exchange with a new exchange (Be_2). Equation (5.1) can therefore be simplified into equation (5.2).

$$S > Cc / r \qquad (5.2)$$

A victim of cheating should persist with a cheating exchange partner if the search costs of finding a new exchange partner are higher than the ongoing costs of cheating. The four variables for search costs can be substituted into equation (5.2) to get (5.3).

$$Sx + \sum_{t=1}^{n} Be^t / (1+r)^t + q.(U) + v.(T) > Cc / r \qquad (5.3)$$

Equations (4.3) and (5.3) describe all the cheating between exchange parties in retail illicit drug transactions. The next step is to ascribe some values to the variables in the equations.

4.7 Expenditures on Search (Sx)

Expenditures on search are only likely to be incidental costs of search in illicit drug markets. Exchange parties can make contacts in the market through social networking alone, without resort to financial expenditure (Alder, 1985; Reuter and Hagga 1989; Long, 1988). Purchasing a market contact, for example by paying a drug user to introduce you to their dealer, is fraught with difficulties (Moore, 1977). The prospective broker is likely to insist they cannot introduce you to their source, but can buy on your behalf (Moore, 1977; Long, 1988). This merely introduces another layer of distribution, with additional opportunities for extracting profit and increasing product dilution (Moore, 1977; Long 1988).

Success at social networking is largely a function of personality. An engaging and affable personality will assist a person in initiating and sustaining the personal exchange relationships that prevail in the market (Reuter and Haaga, 1989; Alder, 1985). The incidental expenses which are incurred during search are related to general socialising, for example buying drinks for people you want to impress.

4.8 The Expected Legal Penalty of Search

4.8.1 Introduction

The search for a new exchange partner can lead to arrest if the wrong person is approached or an exchange party inadvertently begins transacting with an undercover police agent. The expected legal penalty of search is the extra risk of arrest during search multiplied by the disutility of the penalty for a drug offence.

4.8.2 The Extra Risk of Arrest during Search (q)

There is a risk of arrest at two stages in the search process, during the general enquires stage, and after the first transaction is completed (ie. if the exchange partner turns out to be an undercover police agent). Moore (1977) explains, the risk of arrest during search is particularly high because drug dealers have the least information on new customers, and because the pool of unattached customers is disproportionately stocked with informants and undercover police:

"The period of recruiting new customers is dangerous simply because the dealer has the least information and control over new customers at the moment of recruitment. Moreover, the dealer must consider all potential recruits particularly suspect. Dealers must assume that other dealers avoid or exclude customers whom they judge to be risky and retain customers known to be trustworthy. Consequently, an eager, unattached customer is more than proportionately likely to be a marginal, high risk customer. In effect, because all dealers are interested in screening out undercover agents and informants, the pool of unattached customers must be more than proportionately stocked with informants and undercover police." (p.18)

This understanding of the risk of new unattached exchange partners is expanded in Akerlof's (1970) well known paper on quality uncertainty in markets for experience goods. Akerlof (1970) has shown that in markets for experience goods bad quality products (ie. lemons) will drive out good quality products not only because people wish to sell bad quality products and hold on to good quality products, but also because buyers, who are unable to distinguish a good quality product from a bad quality product, will only be willing to pay the low quality price for any of the product. Low market prices will mean only low quality products will be offered for sale in the market.

Alerlof's (1970) analysis can be easily applied to the illicit drugs market. A transaction with a new unattached exchange partner will be more risky than a transaction with an established exchange partner, not only because the pool of unattached exchange partners is naturally disproportionately populated with undercover agents and unreliable exchange partners (ie. the rejects from other dealers), but also because market forces tend to drive out reliable exchange partners from the pool of unattached buyers. Drug dealers are likely to offer new unattached customers poor exchange terms (ie. high prices, low quality drugs) in the expectation they will be an unreliable. Reliable buyers are driven from the pool of unattached buyers by the unattractive terms dealers offered to new customers. The question relevant to the model is how high will be the "extra

risk" of arrest with a new unattached exchange partner. An understanding of the level of extra risk from search can be obtained by considering the general risk of arrest in the retail illicit drugs market.

There is reason to believe the general risk of arrest in the retail illicit drugs market is fairly small. The "victimless" nature of illicit drug transactions makes them more difficult to detect than other crimes (Barnet, 1987). Illicit drug transactions are victimless in the sense there is no victim to complain to the police and provide evidence to achieve a conviction. The police must rely on the willingness of the general public to report offences, or the work of undercover agents. The willingness of the public to report drug offences is undermined by the time required to make a complaint to the police, divided public opinion and peer pressure about the fairness of drug laws, and the risk of retribution from those reported. Undercover operations are unlikely to be as effective in identifying offenders as a complaining victim. Undercover operatives have to locate the offence in the community whereas complaining victims merely respond to actual offences. There are also generally fewer undercover drug agents, than upstanding members of the public, in a society. Alder (1985) reports:

"Dealers believed that the majority of arrests resulted from sheer happenstance. Varying circumstances led to accidental busts: after stopping a dealer for a traffic offence, one patrolman spotted drugs under the dashboard; once, a truck full of marijuana pulled into a gas station to refuel and a nearby patrolman smelled the odor; as a dealer walked down a hotel hallway, his briefcase opened and a marijuana bricks fell out, and while looking for one type of offender the police accidentally stumbled onto another. These are actual instances which befell people I studied, and illustrate why dealers believed that the law of averages functioned to maintain the myth of police effectiveness in the eyes of the public." (p.109)

Exchange parties can take some simply but effective security precautions to reduce the risk of arrest during the "asking around" period. If an individual is discreet and

selective about who they approach, restricting their enquires to old friends or long term acquaintances, the risk an inquiry will result in a complaint is extremely small. Even if a complaint is made to the police it is not sufficient evidence to result in an arrest. The police must view the complaint as serious enough to warrant an investigation or the commencement of an undercover operation. The penalties for some drug offences may not justify such an expenditure of police time and resources.

Exchange parties can also reduce the risk of transacting with an undercover police agent by employing some common screening precautions. For example, only transacting with people they have known for a long time, or who are guaranteed by other trusted individuals. Transacting with an undercover agent only becomes likely when an exchange partner has to venture amongst strangers. Alder (1985) notes:

".....aside from accident and the collusion of informants, dealers and smugglers attributed most arrests to their own negligence, to their failure to observe routine security precautions." (p.110)

4.8.3 The Disutility of the Legal Penalty for a Drug Offence (U)

4.8.3.1 Introduction

The penalty for a drug offence can include a prison sentence, probation, community service, and/ or a fine. The disutility of a legal penalty can be converted into a monetary equivalent (Becker, 1965). For example, a prison term is equivalent to the discounted sum of earnings lost and the value put on loss of freedom (Becker, 1968). Since the earnings forgone and value placed on freedom vary from person to person the cost of a penalty will not be a unique quantity (Becker, 1968). Participants in illicit

drug markets are known to respond to the incentives createdby the risk of arrest and imprisonment (Kim *et al.*, 1993)

The public perception of drug offences may mean they have a disutility beyond their strict judicial penalty. Drug use is often seen to have a detrimental effect on work safety, work competency, and personal integrity (see Nolan, 1994). A drug conviction may significantly affect a persons employment opportunities, standing in the community, and personal relationships. Although the disutility of the penalty is translated into an individual subjective valuation, the penalties set for drug offences can provide a skeleton outline of their importance. The penalties for illicit drug offences in New Zealand are set out in the *Misuse of Drugs Act 1975.*

4.8.3.2 The Misuse of Drugs Act 1975

The severity of the penalty for a drug offence is largely determined by two factors, the type of drug involved, and the offenders role in the market. Penalties are based on the danger the drug type is believed to pose to the public. All drugs prohibited by the *Misuse of Drugs Act 1975* are classified into three classes: A, B, or C. "Class A" drugs are considered the most dangerous and receive the highest penalties, while "Class C" drugs are the least dangerous and receive the lightest penalties. Heroin and cocaine are classified as Class A drugs, while cannabis plant is classified as a Class C drug.

A distinction is also made between the manufacture, importation, or supply of a controlled drug, versus possession for personal use only. Supply offences are considered much more serious than personal use offences because the offender is

actively engaged in spreading drug use in the community.[2] Drug users, on the other hand, are often viewed as the victims of personal circumstances, peer pressure, or sales pressure from drug dealers. The penalties for supply offences are considerable higher than for personal use offences. Supply can be established by evidence of supply, or by the weight of drugs seized from the offender. Table 4.1 presents the maximum penalties for drug offences as stated in the *Misuse of Drugs Act 1975.*

Table 4.1: The Maximum Penalties for Drug Offences in New Zealand

	Supply	Personal Use
Class A	Life imprisonment	Imprisonment not exceeding 6 months or fine not exceeding $1000 or both
Class B	Imprisonment not exceeding 14 years	Imprisonment not exceeding 3 months or a fine not exceeding $500 or both
Class C	Imprisonment not exceeding 8 years	Fine not exceeding $500 unless previous convictions or exceptional circumstances then imprisonment not exceeding 3 months

Source: Misuse of Drugs Act 1975

[2] see David Musto (1973), *The American Disease: Origins of Narcotic Control* and Edward Brecher (1972), *Licit and Illicit Drugs* and Ernest Abel (1980), *Marijuana- the first 12,000 years* for a political history of how the legal penalties for drug offences were developed.

Sentences imposed for drug offences rarely reach the maximums set by the Statute. The actual penalties imposed for drug offences are summarised in statistics produced by the New Zealand Ministry of Justice, 1986-1995. Table 4.2 shows the percentage of cases involving drug offences which resulted in each type of sentence from 1986 to 1995. [3]

[3] The number of cases which Table 4.2 is based is shown in Table (i) in Appendix A.

Table 4.2: Percentage of Cases Resulting in each Type of Sentence for all Drug Offences, 1986-1995

Sentence Type	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Custodial	5.2	6.5	6.4	7.1	8.2	7.7	8.4	6.5	7.3	7.4
Periodic Detention	11.5	14.6	15.3	17.7	22.1	23.6	25.6	25.3	23.3	21.9
Community Programme	0.9	0.8	0.5	0.4	0.4	0.8	0.6	0.5	0.5	0.5
Community Service	2.6	2.3	2.8	4.1	4.5	8.4	10.6	9.9	10.1	8.8
Supervision	3.1	3.4	2.7	3.2	2.5	2.4	2.9	3.3	3.5	3.9
Subtotal-Comm - unity	18.0	21.2	21.2	25.4	29.6	35.1	39.8	39.0	37.3	35.1
Monetary	74.7	69.1	69.4	64.9	59.9	53.9	47.1	49.8	50.7	52.2
Deferment	1.3	1.8	1.7	1.7	1.4	2.1	2.7	2.5	2.2	2.8
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Conviction & Discharge	0.8	1.5	1.4	0.9	0.9	1.2	1.9	2.1	2.5	2.6
Subtotal - Other	2.0	3.3	3.0	2.6	2.3	3.3	4.6	4.6	4.7	5.4

Source: New Zealand Ministry of Justice, 1986-1995

Over 90% of drug offenders received either a fine or some form of community based sentence. Only between 5-8% of offenders received a custodial sentence. There was an increase in the use of community based sentences largely at the expense of monetary penalties. The percentage of drug offenders who received a community based sentence increased steadily from 18% in 1986, to 35% by 1995. The percentage of drug offenders who received a monetary penalty fell from 75% in 1986, to 52% by 1995.

The role drug type and market involvement play in the likelihood of a custodial sentence is illustrated in Table 4.3. Table 4.3 presents the percentage of cases resulting in a custodial sentence by type of drug offence from 1986 to 1995. [4] The category "use cannabis" includes the use of cannabis and the possession of cannabis other than for supply. Convictions for the importation or cultivation of cannabis have been included in the category "deal in cannabis." The category "other cannabis" are mainly offences related to the possession of pipes or other utensils.

[4] Table 4.3 deals with the custodial sentencing of only *some* of the drug offences from the previous table. The exact number of cases that table 4.3 is based on is shown in Table (ii) in Appendix A.

Table 4.3: Percentage of Cases Resulting in a Custodial Sentence by Type and Drug Offence, 1986-1995

Offence	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Use Cannabis	3	3	1	2	2	2	3	3	2	2
Deal Cannabis	11	14	16	15	12	12	12	10	13	12
Other Cannabis	3	4	2	2	1	3	2	2	2	3
Use Other Drug	7	9	8	6	5	7	7	7	5	5
Deal Other Drug	67	67	62	69	68	65	59	51	46	40
Other Drug	13	11	13	8	13	12	11	11	10	5

Source: New Zealand Ministry of Justice, 1986-1995

The level of custodial sentencing in each of the categories was fairly stable during the period. Offenders were generally not given custodial sentences for use and possession offences. Only between 1-3% of cases for the "use of cannabis" resulted in a custodial sentence. Only between 5-9% of cases for the "use of a drug other than cannabis" resulted in a custodial sentence. Offenders were also generally not given custodial sentences for "dealing cannabis." Only between 10-16% of cases involving "dealing cannabis" resulted in a custodial sentence. In contrast, cases involving "dealing a drug other than cannabis" regularly received a custodial sentence. Up until 1992, around two-thirds of cases involving "dealing in drugs other than cannabis" resulted in a custodial sentence. In more recent years this has fallen to 40%.

Table 4.4 presents the average length of custodial sentence for different types of drug offences. [5] The average length of sentence is generally well below the maximums set by the *Misuse of Drugs Act 1975*. The maximum penalty for dealing a Class A drug is life imprisonment. The highest annual average sentence for dealing a drug other than cannabis was only 38.6 months (just over 3 years). The maximum penalty for dealing in a Class C drug was 8 years imprisonment. The highest annual average penalty for dealing in cannabis was 13.9 months (just over 1 year).

Table 4.4: Average Custodial Sentence Length (in Months), by Type of Drug Offence, 1986-1995

Offence	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Use Cannabis	1.9	2.0	1.5	1.5	1.3	1.6	1.5	1.4	1.4	1.2
Deal Cannabis	8.5	10.5	11.3	10.9	11.4	10.3	11.3	10.0	12.1	13.9
Other Cannabis	2.4	2.7	4.2	2.7	-	2.3	1.3	3.6	3.1	2.9
Use Other Drug	2.7	2.7	2.2	2.4	-	2.5	1.9	1.8	-	2.2
Deal Other Drug	38.6	23.2	19.8	36.2	31.8	31.9	30.3	32.7	30.7	28.7
Other Drug	18.1	14.1	15.0	2.7	11,8	3.0	3.8	6.7	-	-
Overall Average	10.9	10.0	11.3	13.6	14.7	13.6	13.2	12.2	13.3	13.8

Source: New Zealand Ministry of Justice, 1986-1995

The above penalty structure suggests dealers of Class A and Class B drugs should be most concerned about arrest during search. Studies of heroin and cocaine dealers

[5] Table 4.4 deals with the custodial sentencing of only *some* of the drug offences from previous tables. The exact number of cases that table 4.4 is based on is shown in Table (ii) in the Appendix A.

indicate the risk of transacting with an undercover agent is one of the leading reasons why dealers limit their number of customers (Moore, 1977; Alder, 1985; Reuter and Haaga, 1989; Michael, 1987). Users of all drug types, and dealers of Class C drugs, face fairly moderate penalties.

4.9 The Expected Loss from Victimisation during Search

4.9.1 Introduction

The search for a new exchange partner can result in victimisation if an unreliable individual is approached. The expected loss from victimisation during search is the extra risk of victimisation during search multiplied by the value of the property lost from cheating. The value of the property lost from cheating is a function of the type of cheating carried out and the value of the property involved.

4.9.2 The Extra Risk of Victimisation during Search (v)

The inflated black market price of illicit drugs can put drug users under considerable financial pressure. Many drug dealers are also heavy drug users (Alder, 1985). The easy access they have to drugs often makes it difficult for them to moderate their drug consumption. Heavy personal consumption sometimes means dealers cannot pay for drugs, or must dilute their merchandise heavily to recover their losses (Alder, 1985). Some exchange parties may resort to cheating on transactions to finance their drug consumption. Long (1988) explains:

"In theory, people will treat you right if you treat them right, and perhaps that is true in some facets of life, but it is not the case when the white lady [cocaine] is strutting her stuff in your life. Street people cannot afford to put four or five hundred dollars a week in their nose or in their arm, and you better believe that someone somewhere is getting ripped off or burned for the money you are taking in, and you are as much a target as anyone else who has the scratch or the product." (my explanation, p.60-61)

Akerlof's (1970) analysis of quality uncertainty in markets for experience goods suggests the pool of unattached customers will be disproportionately stocked with unreliable exchange partners. Reliable exchange partners will be driven from the pool of unattached customers by the unattractive terms offered to new customers by dealers. The relevant question is how high will be the "extra risk" of victimisation from transacting with a new unattached exchange partner. Again, an understanding of the extra risk of victimisation can be obtained by considering the general risk of victimisation in the market.

Several features of the market reduce the need to resort to victimisation to finance drug use. The expense of illicit drug consumption is determined by the type of drug consumed and the level of consumption. Heroin is probably one of the most expensive drug habits because it is expensive to begin with, and it creates a physical addiction characterised by increasing tolerance. Other drugs, such as cannabis, are much cheaper and do not create a strong physical addiction. Consumers of non-addictive drugs are able to moderate their consumption to fit their financial circumstances.

Exchange parties have other means to finance their drug consumption apart from victimisation (Michaels, 1987). Many drug users can support their drug consumption through paid employment. Others use welfare, borrowing, prostitution, shop-lifting, and low level drug selling. Drug users generally prefer consensual illegal work to victimisation because there is less risk of personal injury (Michaels, 1987).

Drug dealers can follow a number of strategies to reduce the risk of victimisation. They can refuse sales to violent or unreliable customers (Moore, 1977). They can establish rules of conduct for transactions. Long (1988) suggests transaction rules such as, "no weapons," "always telephone before coming around," and "come alone." Customers who do not follow the rules are refused further sales. Drug dealers can also reduce the benefits of robbery by hiding stocks of drugs in secret caches, and only bringing the drugs required for a transaction to the exchange location (Long, 1988; Moore, 1977).

4.9.3 The Value of Property Lost from Cheating (T)

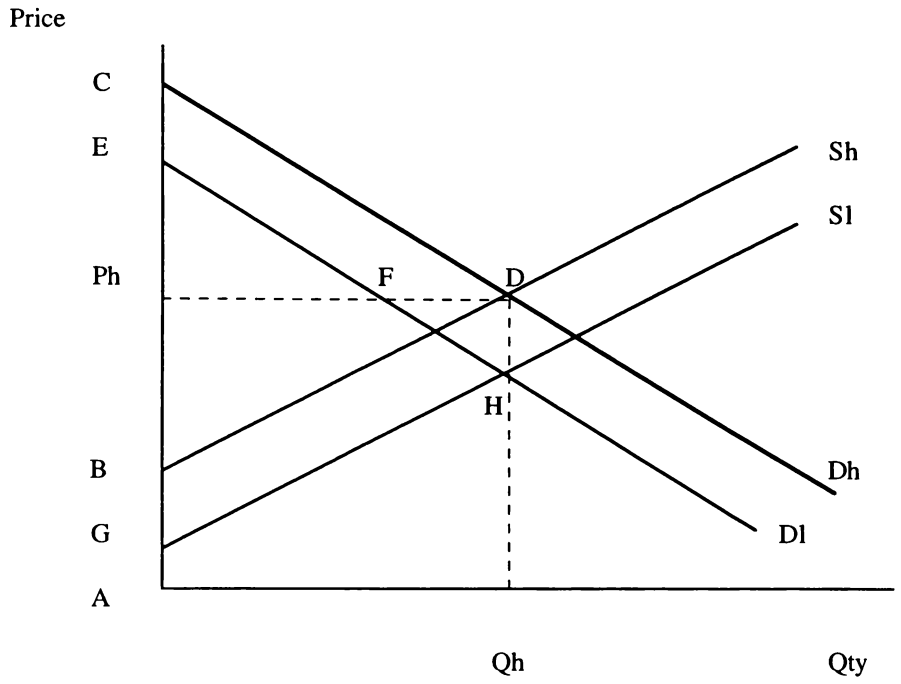
4.9.3.1 Introduction

The value of the property lost from cheating is a function of the type of cheating carried out and the value of the property involved.

4.9.3.2 The Type of Cheating

The loss from cheating is initially determined by the type of cheating employed. There are three types of cheating, quality fraud, product fraud, and robbery (assault). Quality fraud involves the seller misrepresenting the quality of drugs they have for sale. The losses from quality fraud are presented in Figure 4.1.

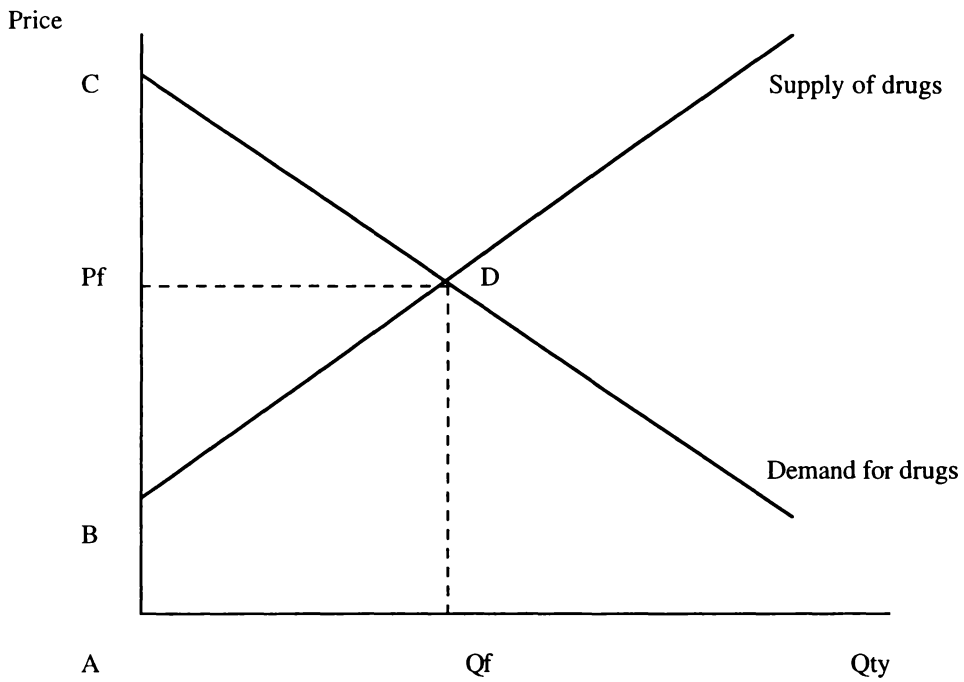
Figure 4.1: The Losses from Quality Fraud



The equilibrium price (Ph) and quantity (Qh) is based on the sellers misrepresented supply curve for high quality drugs (Sh), and the buyers real demand for high quality drugs (Dh). The buyer has an expectation of a consumer surplus equal to PhCD. After purchase, the buyer discovers the drugs are in fact low quality. The buyers actual consumer surplus is now calculated using the demand curve for the lower quality drugs (Dl) and the price for the high quality drugs Ph, an area equal to PhEF. The sellers producer surplus is calculated by using the supply curve for the low quality drugs (Sl) and the price for the high quality drugs received (Ph), an area equal to GPhDH. The net result of the quality fraud is the seller gains a greater proportion of the exchange surplus than they would under normally conditions, and the buyer less.

Product fraud involves the seller passing off a worthless substance as valuable drugs. The losses from product fraud are illustrated in Figure 4.2. The price (Pf) and quantity (Qf) agreed upon is based on the sellers misrepresented supply curve for the drugs, and the sellers real demand curve for the drugs. Actually the drugs are worthless, so the buyer loses their money and the consumer surplus they would have obtained if the drugs were authentic, a loss of APfDQf + PfCD. Meanwhile, the seller gains the buyers money but provides no valuable product, a gain of APfDQf.

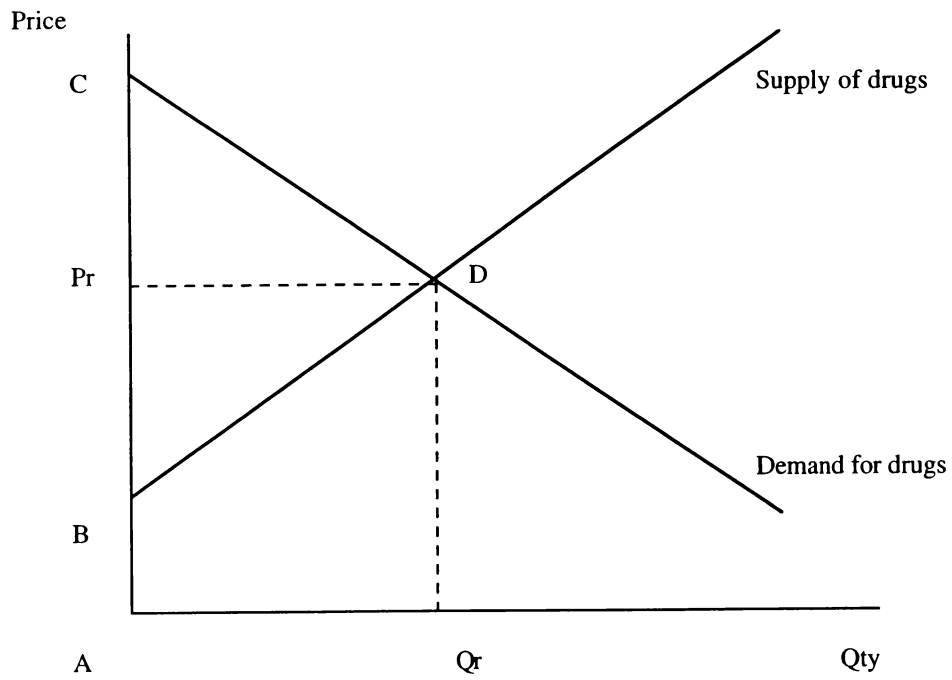
Figure 4.2: The Losses from Product Fraud



Robbery involves one exchange party robbing the other of their wealth, which maybe money or drugs, or both. The benefits from robbery are illustrated in Figure 4.3. If

the seller robs the buyer they gain the buyers money without having to provide any drugs in return, a benefit of at least APrDQr. The benefit could be larger than APrDQr if the buyer is carrying money or drugs beyond what is needed for the transaction. The buyer loses their money and receives no drugs, a loss of APrDQr + PrCD. If the buyer robs the seller they gain the sellers drugs without having to pay any money, a gain of ACDQr. The seller loses their drugs and receives no money, a loss of ABDQr + BPrD.

Figure 4.3: The Losses from Robbery



In summary, quality fraud merely redefines and redistributes the surplus from exchange in favour of the seller, while product fraud and robbery actually transfer the wealth of a transaction from one exchange partner to the other.

4.9.3.3 The Value of Retail Illicit Drug Transactions

The value of retail illicit drug transactions can be used to determine the value of the property lost during cheating. This assumes exchange partners carry no other wealth beyond what is required for the transaction. This is a reasonable assumption given the circumstances of illicit drug exchange. From the dealers perspective, carrying amounts of money or drugs above what is need for a few transactions needlessly invites victimisation, and increases their legal liability if arrested. Street dealers usually only carry a small amount of drugs on their persons and hide the bulk of their drugs in a nearby cache (Moore, 1977; Long, 1988). Buyers also have incentives to restrict the amount of cash they bring to drug transactions. They often have to enter high crime neighbourhoods to purchase drugs and also face the risk of robbery by their dealer (Moore, 1977).

There are two components to the value of a transaction, the amount actually paid/ received, and the consumer/producer surplus. The size of the consumer/producer surplus is determined by the price elasticity of demand/supply for illicit drugs. In a subsequent section of this chapter it will be argued the demand and supply for illicit drugs is relatively inelastic. The respective exchange surplus will therefore be large relative to the market value of the transaction.

The financial size of a transaction is influenced by a whole range of factors, such as the characteristics of the product, the nature of demand, and the nature of supply. The financial size of retail illicit drug transactions are restricted by three additional

constraints; the financial difficulties with buying illicit drugs in large quantities, the fear of robbery and "rip-off," and the penalty structure of the *Misuse of Drugs Act 1975* and its judicial interpretation.

The enforcement of prohibition significantly inflates the price of illicit drugs. Michaels (1987) quotes a media report that twenty 10 milligram tablets of heroin legally prescribed for the terminally ill in England only costs around $1 ($U.S.), the same amount of heroin on the black market would cost from $100 to $300. One gram of cocaine which sells for $60-80 ($U.S.) on the black market is estimated to only cost $3-4 to produce (Kaplan, 1988; Kleiman and Saiger, 1990; Nadelmann, 1989). Inflated prices reduce the quantity of illicit drugs demanded.

Exchange parties must also pay for their drugs immediately and in cash, they cannot use credit cards or hire purchase arrangements. Purchases must be made from current disposable income. This restricts the amount of a drugs exchange parties are able to purchase at any one time.

Exchange parties in illicit drug markets are vulnerable to robbery and "rip-off" because of the absence of third party enforcement and related market institutions (eg. product labelling, standard packaging). They cannot use the police and courts to enforce the terms of transactions, and often find it difficult to measure the quality of drugs before purchase. Analysis of the different types of cheating indicate robbery and product fraud impose significant losses on exchange parties. Exchange parties can effectively minimise the potential losses from victimisation by purchasing drugs in small quantities. Low value transactions are a low risk strategy to gather information on the quality of drugs and the integrity of sellers.

The financial size of illicit drug transactions are also constrained by the penalty structure of the *Misuse of Drugs Act 1975* and its judicial interpretation. The weight of drugs found on an offender is sufficient to establish the "presumption" of possession for supply (Misuse of Drugs Act 1975). "Presumption" of supply reverses the burden of proof in favour of the prosecution (Robertson *et al.*, 1992). The defendant has to prove they did not intend to sell the drugs for profit, rather than the prosecution having to prove they intended to sell them. Section 6 (6) (a-e) of the *Misuse of Drugs Act 1975* states, if an offender is in possession of five grams or more of morphine, or half a gram or more of cocaine or heroin, or two and a half milligrams or more of lysergide, or 25 or more flakes each containing some quantity of lysergide, or two hundred and fifty milligrams or more of tetrahydrocannabinol (THC), or five grams or more of cannabis preparation, or 28 grams or more of cannabis plant, or 100 or more cannabis cigarettes, they are deemed as having possession for the purposes of supply.

The importance of the distinction between a conviction for possession of a drug for personal use, versus possession for supply, is illustrated in Table 4.1. The maximum sentence for possession of a Class A drug for personal use is 6 months imprisonment, whereas the maximum sentence for possession of a Class A drug for supply is life imprisonment. The Ministry of Justice statistics presented in Table 4.3 and Table 4.4, further underline the importance of the distinction between personal use and supply. Table 4.3 shows the likelihood of a custodial sentence for dealing offences is much higher than for use offences. Around two-thirds of cases involving "dealing in drugs other than cannabis" resulted in a custodial sentence, compared to less than 10% of cases involving the use of a drug other than cannabis. Table 4.4 shows the average length of sentence is much higher for dealing offences than for use offences. The average sentence for "dealing in drugs other than cannabis" ranges from 19.8 - 38.6 months, compared to between 1.8 - 2.7 months for the "use of a drug other than

cannabis." The custodial sentence for dealing in a "drug other than cannabis" is approximately 10 to 12 times longer than the sentence for the "use of a drug other than cannabis."

The weight of drugs found on an offender is also used by the courts as a guideline for sentencing within the ranges set by the *Misuse of Drugs Act 1975* (see Mathias, 1988). The general rule is the more drugs found on an offender the more serious the offence. The New Zealand Court of Appeal makes this clear in *R v Urlich* where they consider the sentencing guidelines for dealing in a Class A drug:

"In relation to importing Class A drugs it was observed that there were three categories of cases: (1) those where the amount [of drug] was measured in milligrams for the offender's own use, for which a penalty of up to two years is appropriate; (2) those of an intermediate level of seriousness, where something like 6 or 7 ounces was involved and the offender was motivated by profit; and (3) large scale importations where sentences of nine to sixteen years could be expected." (my explanation, Mathias, 1988, p.171)

The use of the weight of drugs by law makers as a means to distinguish the lesser offence of "use," from the much more serious offence of "supply," and the use of the weight of drugs as a guideline for sentencing, create incentives for drug users to purchase drugs in small quantities, and for drug dealers to refrain from holding large inventories of drugs. By buying in small amounts a drug user clearly distinguishes themselves as a user and avoids been charged with the much more serious offence of supply. Holding small inventories of drugs is one way a dealer can avoid being charged for supply offences. Dealers face strong incentives to dispose of their stocks of drugs as quickly as possible. Even if a dealer is charged with a supply offence, the

smaller the amount of drugs they are caught with the lighter will be their sentence. Purchases of small weights of drugs imply low value transactions.[6]

4.10 The Present Value of the Future Stream of Exchange Forgone During the Search Period

4.10.1 Introduction

The most commonly incurred cost of search in the illicit drugs market is the time taken finding exchange partners and exchange opportunities. Drug dealers and drug users are secretive and suspicious of strangers. The process of "asking around" is inexact and time consuming. Enquires must be selective and cautious to avoid the attention of the police. Even when an exchange partner is identified, reliability has to be adequately demonstrated before exchange can proceed.

Moore (1977) suggests the time-consuming nature of transactions is a major constraint on the rate at which heroin moves to retail markets:

> To protect the transactions, dealers rely on many strategies we identified: screening customers, drop strategies, investing in muscle, and so on. Moreover dealers may go through several trial runs to discover what the real intentions of the participants are and to increase confidence in the procedures. The net effect of these precautions is to make transactions complicated and time consuming at all levels. "Scoring" can be a three to four-hour problem even for experienced users. It can be a protracted four month negotiation among high level dealers.....There may be sufficient demand, capital, raw materials, and ambitious entrepreneurs to triple the size of the current market. But the supply does not triple because the transactions cannot be confidently and quickly arranged. In effect, what is scarce in the system is a reliable connection." (p.59)

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[6] The weights set by drug statutes specify drug types so exchange parties cannot simply switch to high value drug types and buy in lower quantities. To some extent exchange parties can avoid weight restrictions by improving the potency of existing drug types. Mark Thornton (1991) discusses and analyses this incentive. He argues the increasing potency of marijuana, and the introduction of "crack" cocaine, can in part be attributed to producers attempting to avoid the penalty structure of drug prohibition statues. If producers are able to adjust potency then it is possibly that small weights of drugs can still represent high value transactions.

"It is very hard to demonstrate that the difficulty of executing transactions is a major constraint on the throughput capacity of the distribution system. Perhaps the strongest pieces of evidence are simply police observations of the enormous effort required to complete a deal, and the existence of the term "connection." The fact that this term exists, and is spoken of in reverent tones, suggest the importance of a relationship with someone who can execute transactions reliably." (Moore, 1977, p.59, footnote nnn)

A reputation for cheating will make the search for a new exchange partner even more time consuming. Exchange parties will refuse exchange on the basis of what they have heard from other associates. The worse the reputation, the further a person must go to find a willing exchange partner, and the longer the process will take. Alder (1985) explains:

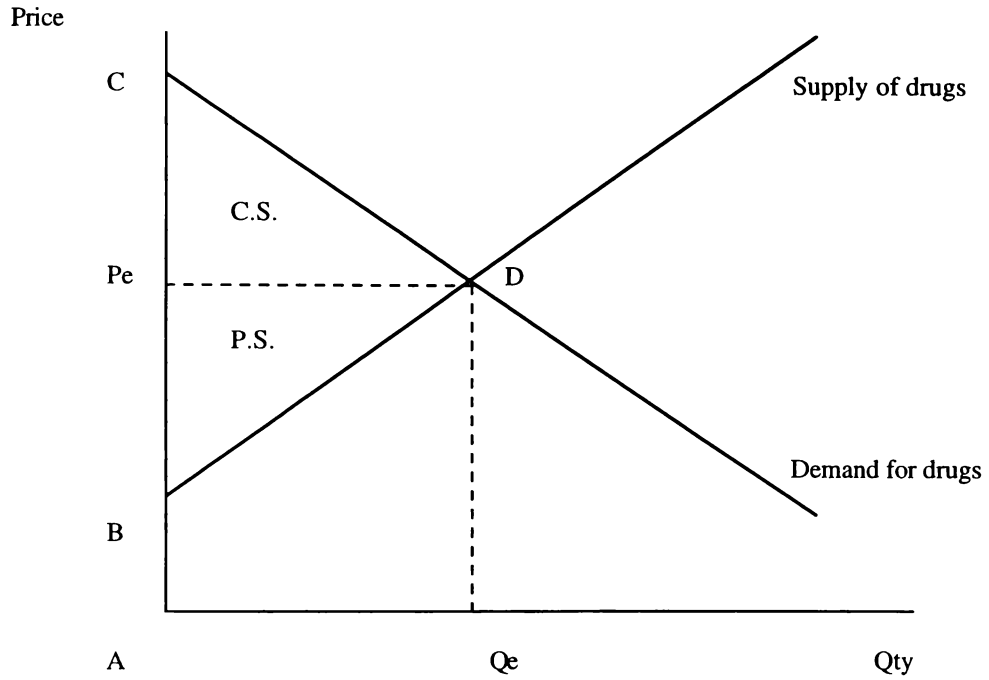
"...drug thieves were not a stable population in Southwest County; their reputations eventually caused them to be shunned by others as business associates." (p.101)

The cost of the time taken to find a new exchange partner can be represented by the present value of the stream of future exchange forgone during the search period. Three variables are used to calculate the magnitude of this value, the benefits of exchange, the discount rate, and the number of periods it takes to find the new exchange partner.

4.10.2 The Benefits of Exchange (Be)

The size of the benefits of exchange can be illustrated with the standard economic diagram of exchange. Figure 4.4 depicts the mutual benefits from a retail illicit drug transaction.

Figure 4.4: The Mutual Benefits of an Illicit Drug Transaction



The buyer and seller agree on price (Pe) and quantity (Qe), based on their respective demand and supply curves for illicit drugs. The consumers surplus is equal to the area PeCD. The producers surplus is the area BPeD. The size of the surplus from exchange, for a given equilibrium price and quantity, is determined by the price elasticity of demand/ supply. The more inelastic the demand and supply curves the larger will be the mutual benefits of exchange relative to the market value of the transaction.

There is not enough price data to calculate reliable price elasticities of demand and supply for illicit drugs (Stevenson, 1994; Warner, 1993; Michaels 1987).[7] Economists have speculated about elasticities for illicit drugs based on the characteristics of illicit drugs and the nature of the illicit market. The demand for illicit drugs is widely held to be relatively inelastic, because illicit drugs tend to be addictive and there are few substitutes for illegal psycho-active substances (Stevenson, 1994). A relatively inelastic demand for illicit drugs is consistent with the elasticities calculated for cigarettes and alcohol, where a proportion of consumers are also addicted (Warner, 1993). The inelastic demand for illicit drugs suggests the benefits of exchange will be relatively large for buyers.

The supply of illicit drugs, on the other hand, is generally held to be elastic over a wide price range (Stevenson, 1994; Nell, 1997). It is argued there are no scarce factors of production which would act as a barrier to entry into the market (Stevenson, 1994). Suitable land for production is abundant, and no unusually skilled labour is required in the production, transport, or distribution of illicit drugs (Michaels, 1987).

This analysis ignores the role information and risk play in the distribution of illicit drugs. What is scarce in the distribution of illicit drugs is information - information about the identity and reliability of trading partners, and the quality and availability of product (see Michaels 1987; Moore, 1977). A person cannot simply enter the market and begin selling illicit drugs, they have to locate a reliable supplier who is willing to sell them drugs in bulk, and they have to locate willing and reliable buyers, all without

[7] The data siuation may be improving. A recent article by Saffer and Chaloupka (1999) estimates the demand for illicit drugs using a new data set of cocaine and heroin prices from the Drug Enforcement Agency that was linked to individual records by the Office of Applied Studies at the Substance Abuse and Mental Health Services Administration. Saffer and Chaloupka (1999) found the average elasticity of cocaine participation for the past month was -.28 and for the past year -.44. The average elasticity of heroin participation for the past month is -.94 and for the past year -.82.

alerting the police (Long, 1988). Sellers also have to deal with risk. A significant determinant of the supply price at retail level is risk - risk of arrest by the authorities, and risk of victimisation by competitors and customers (Rubin, 1973). Risk increases with number of exchange partners a seller deals with, and the number of transactions completed (Rubin, 1973; Moore, 1977; Alder, 1985). The reason there is so many levels of distribution in the illicit drugs market is dealers trade off income for reduced risk (Rubin, 1973). They sell their drugs to intermediate dealers in one or two bulk transactions, rather than having to complete many small high risk transactions at retail level.

The informational barriers to entry, and the risk of transactions, make the supply of illicit drugs at retail level relatively inelastic. It is difficult for new dealers to enter the market in response to price increases, at least in the short term, because they have to find a supplier and customers. The quantity of drugs distributed by each dealer is relatively unresponsive to price increases because the price rise has to be sufficient to compensate the dealer for the extra risk of carrying out additional transactions or approaching new customers. If a price increase merely reflects an increase in the risk of arrest or victimisation, there is no economic incentive for the dealer to expand their dealing activity (ie. move from their present risk/ income equilibrium). Alternatively, the quantity of drugs distributed is relatively unresponsive to price falls, because established exchange relationships are much lower risk customers than new relationships. The price must fall considerable before and established low risk exchange is ceased, and the quantity distributed falls. Again, if the price fall merely reflects a lower risk of arrest or victimisation, there is no economic incentive to reduce dealing activity. A relatively inelastic supply curve suggests the benefits of exchange will be relatively large for sellers.

The price data provided by Long (1988) demonstrates the profitable nature of drug dealing. According to Long (1988) cocaine dealers should aim to double their original investment at every sales cycle. Profit is earned by buying drugs in bulk and then selling them in smaller units at a higher unit price, and by increasing the original quantity of product by adding an additive, known as "cutting the product." The legitimate rationale for "cutting the product" is to reduce the potency of the drug to make it safe for street level consumption (New Zealand Customs, 1980). Long (1988) determines the extent of the "cut" on cocaine by the gross profit target of "two to one" on the original investment. After the "cut," 30% of the final product is additive, which is 43% of the original purchase (Long, 1988). Table 4.5 presents the gross profit ($U.S.) margins for basic weight graduations of cocaine using figures provided by Long (1988).[8]

[8] The price data is provided by Long (1988) in Chart A, p.10. The last two columns are additional calculations using the figures from Chart A. All prices quoted are in United States currency.

Table 4.5: The Prices and Gross Profit Margins for Four Basic Weight Graduations of Cocaine

Weight (grams)	Cost($)	Cut (grams)	Total Weight	Sale Price($)	Cost per Gram($)	Gross profit per gram($)
3.5	250	1.5	5.0	500	71	142
7.0	500	3.0	10.0	1000	71	142
14.0	1000	6.0	20.0	2000	71	142
28.0	2000	12.0	40.0	4000	71	142

Source: adapted from Long, 1988

In the case of cannabis, profit is earned by reselling the drug in smaller weights at a higher unit price, and by selling underweight bags. Long (1988) explains:

"The unwritten rule for a twenty five dollar bag (of cannabis) is that it weighs one full ounce. However, in all the years I dealt drugs, I never met one Marijuana dealer that sold a twenty five dollar bag of pot that weighed a full ounce. The choice is yours, of course, but keep this in mind: you are in a dangerous business with the intention of making as much money as possible in the shortest amount of time, and if your smart, you will make it a hit-and-run endeavour so you will have the opportunity to enjoy your profits." (my explanation, p.16)

Table 4.6 presents the gross profit ($U.S.) margins for basic weight graduations of cannabis using figures provided by Long (1988).[9] Twenty volume bags are made up from a pound instead of sixteen full ounce bags.

Table 4.6: The Prices and Profit Margins for Three Basic Weight Graduations of Cannabis

Weight (ounce)	Cost($)	Volume Bags	Sale Price($)	Cost per Ounce($)	Gross Profit per Vol. Bag($)
4	75	5	125	18.75	31.25
8	150	10	250	18.75	31.25
16	300	20	500	18.75	31.25

Source: adapted from Long, 1988

Cannabis dealers earn a 60% gross profit margin from the repackaged resale of cannabis.

[9] The price data is provided by Long (1988) in Chart E, p.15. The last two columns are additional calculations using the figures from Chart E. All prices quoted are in United States currency.

4.10.3 The Discount Rate of Exchange Parties (r)

4.10.3.1 Introduction

The discount rate represents how exchange parties value the future (Pearce and Turner, 1990). In the case of ongoing interaction it also includes the likelihood exchange parties will meet again in the future (Axelrod, 1990). Important determinants of how exchange parties value the future are risk and uncertainty, and time preference (Pearce and Turner, 1990). The main sources of risk and uncertainty in the illicit drugs market are the effects of drug intoxication and drug withdrawal, the risk of arrest by the authorities, and the risk of victimisation by customers and competitors.

4.10.3.2 Drug Intoxication and Drug Withdrawal

Drug intoxication can lead to short term decision making. The characteristics of drug intoxication will vary significantly between illicit drug types. Some illicit drugs produce an overpowering state of intoxication while others have much more mild effects. Cocaine produces an intense "high" which lasts for about half an hour, whereas cannabis produces only a mild euphoria which lasts for 2-3 hours (Alder, 1985; Drugs Advisory Committee, 1995; Kuhn et al., 1998). Levels of intoxication are also determined by a number of factors beyond general pharmacology, such as the strength of the dose, the method of administration, the personality of the user, the users experience with drugs, whether other drugs are taken, individual physiology, and the social context of drug use (Drugs Advisory Committee, 1995; Zinberg, 1987).

Illicit drugs generally produce levels of intoxication beyond legal drugs. It is the very intensity of the intoxication from illicit drugs which is likely to reduce the impact of intoxication on transactions. Exchange parties would be very unwise to attempt a

financial transaction under the influence of many illicit drugs. Goldstein (1989) reports intoxicated drug users are often the target of street crime because of their degree of incapacity.

Drug intoxication can also lead to violent behaviour. The propensity of illicit drugs to induce violent behaviour varies significantly between illicit drug types (Goldstein, 1989). The illicit drugs most commonly associated with violent behaviour are stimulants, barbiturates, PCP, and cocaine. Illicit drugs can also have the opposite effect and actually reduce violence tendencies. Heroin, tranquillisers, and cannabis, are illicit drugs which have this calming effect.

The effects of drug withdrawal can also lead to short term decision making and violence (Goldstein, 1989) Heroin withdrawal causes severe anxiety and physical sickness which can lead to violent behaviour. Similarly, "coming down" from a cocaine high, known as the "crash," is described as a period of anxiety and depression which has lead to violent behaviour.

Drug dealers can follow two strategies to avoid the problems of intoxication and drug withdrawal amongst their clientele. First, they can avoid selling drugs which are associated with violent or indiscreet behaviour. Long (1988) describes such a strategy:

"I would...advise against developing a clientele that uses strictly quaaludes, unless the sales are in bulk to a lude dealer. As a rule, people who use ludes regularly are very loud, boisterous, and have very little common sense about their actions while under the influence of the drug. They will therefore attract a great deal of attention by passing out in your front yard, hitting your car in the drive way, and loud talking you everywhere and anywhere. Methaqualome seems to have side effects that border on suicidal bravery. I was once forced into a physical confrontation with a college football player who had taken six ludes, which should have been enough to knock out a horse, but all it did to him was make him mad and violent. He was just about impervious to pain. In the process of the fight I broke his nose, jaw, and his neck, and he was still fighting back. I hit him so many times in the face my hands looked like cantelopes for a week. When the police arrived on the scene, he attacked them too, which was fine with me, because while they were dealing with him I made my exit. This type of situation with lude users is not uncommon, and it is the kind of attention you do not need, especially in your own neighbourhood." (Long, 1988, p.18).

Second, they can refuse further sales to indiscreet or violent customers (Moore, 1977; Alder, 1985). Drug users can avoid unreliable or violent drug dealers by choosing not to buy drugs from them.

4.10.3.3 The Risk of Arrest

Exchange parties face the risk of arrest by the authorities during transactions. Drug dealers are particularly at risk because they are involved in many more transactions than drug users, and are more widely known in the marketplace.

The amount of legal pressure on exchange parties will be influenced by the type of drug involved in a transaction, and the current enforcement policy toward the drug. The police are likely to allocate their scarce resources to drug enforcement on the basis of the seriousness of an offence. This is communicated to them in the penalties set out in the *Misuse of Drugs Act 1975*. For example, arresting heroin dealers is likely to be seen as more important than arresting cannabis users. The allocation of police

resources can also be influenced by changes in the number of offences, and the subsequent public concern over the change in offending.

Exchange parties can minimise the risk of arrest by screening exchange partners. A common security procedure is to restrict transactions to long term social acquaintances or those guaranteed by trusted associates (Moore, 1977; Alder, 1985).

4.10.3.4 The Risk of Victimisation

Exchange parties face the risk of victimisation by exchange partners during transactions. Again, drug dealers are particularly at risk because they are involved in many more transactions than drug users. Exchange parties can reduce their overall risk of victimisation by avoiding problem drug types and problem drug users (Long, 1988). Exchange parties can also restrict transactions to long term associates or those guaranteed by trusted associates (Moore, 1977; Alder, 1985). The security of transactions can be improved by insisting on rules of conduct for transactions, and hiding inventories of drugs (Long, 1988; Moore, 1977).

4.10.3.5 The Likelihood of Ongoing Interaction

The discount rate also includes the likelihood exchange parties will meet again in the future. High search costs in a market create expectations of repeat interaction (Geertz, 1978; 1979). The demands of secrecy and security in the illicit drugs market reinforce the incentives to return to people who have proven to be reliable in the past. Studies of illicit drug markets indicate exchange relationships are often stable and long term (Reuter and Haaga, 1989; Moore 1977; Michaels, 1989; Alder, 1985).

4.10.4 The Number of Periods before a New Exchange Partner is Found (n)

The number of periods it takes to find a new exchange partner is a function of search in the market, and the reputation of an exchange party. Search in illicit drug markets is time consuming because illicit drug markets are fairly small, exchange parties are secretive and suspicious, and there are no market institutions to assist exchange parties with finding exchange partners (eg. advertising, prominent store locations) (see section 4.10.1). A reputation for cheating will extend the time it takes to find a new exchange partner.

4.11 The Expected One-Off Benefit of Cheating

4.11.1 Introduction

The expected one-off benefit from cheating is the probability of successful cheating multiplied by the value of the property gained from cheating. The value of the property gained from cheating is a function of the type of cheating carried out and the value of the property involved. The value of the property gained from cheating is determined by the same factors which determine the value of the property lost from cheating (see section 4.9.3). The value of the property gained from cheating will be constrained by the low value of retail illicit drug transactions (see section 4.9.3.3).

4.11.2 The Probability of Successful Cheating (p)

In Chapter 3, it was argued exchange parties will find it difficult to detect cheating before a transaction is complete. The physical complexity of illicit drugs (ie. chemical concentrates) made inspection ineffective, prohibition statutes restricted the development and availability of measurement technology, and the characteristics of

drug intoxication often made product sampling impractical. To simplify matters, it was assumed exchange parties could not detect cheating before a transaction was complete (ie. illicit drugs were pure experience goods).

A more realistic approach is to allow for the possibility exchange partners can detect cheating before a transaction is complete, and therefore prevent exchange partners from gaining the benefits from cheating. Although the likelihood of successful cheating will not be 100%, in the case of many illicit drugs it is likely to be fairly close to 100%. Drug quality is difficult to determine without product labelling or accurate measurement technology. The resemblance of many illicit drugs to common pills and powders can make product fraud difficult to detect (Moore, 1977; Collingwood, 1999). Exchange parties attempting robbery will have the advantage of surprise, and can select victims on the basis of a high probability of success. The actual probability of success will be a function of the physical characteristics of the drug involved, the experience of the victim, and circumstances of the transaction. The risk of failure will reduce the benefits of cheating.

4.12 Conclusion

This chapter has added search costs to the decision to cheat in a competitive market. An exchange party should cheat if the expected one-off benefit of cheating is greater than the search costs of finding a new exchange partner. The decision to cheat is presented in equation (4.3).

$$p.(Bc) > Sx + \sum_{t=1}^{n} Be^t/(1+r)^t + q.(U) + v.(T) \qquad (4.3)$$

Analysis of the illicit drugs market suggests it will often be rational to voluntarily honour the terms of retail illicit drug transactions. The expected one-off benefit of cheating is often low, while the search costs of finding a new exchange partner are often high. The expected one-off benefit of cheating is often low because although the probability of successful cheating (p) is high, the one-off benefit of cheating (Bc) is restricted by the low value of transactions. Search costs are high because exchange parties are secretive and suspicious, there are no market institutions to assist exchange parties with finding exchange partners, and market search can result in arrest and victimisation. Transactions with a new unattached exchange partner will generally be more risky than exchange will an established exchange partner. Exchange parties face an extra risk of arrest (q), and an extra risk of victimisation (v), when approaching new exchange partners. The present value of exchange forgone during the search period will often be high because the benefits of illicit drug exchange (Be) are high, and it will often take a long time to find a new exchange partner (n).

An exchange party should persist with a cheating exchange partner if the search costs of finding a new exchange partner are higher than the ongoing costs of cheating. The decision to persist with a cheating exchange partner is presented in equation (5.3).

$$Sx + \sum_{t=1}^{n} Be^{t} / (1+r)^{t} + q.(U) + v.(T) > Cc / r \qquad (5.3)$$

It will usually pay for a cheated exchange party to quit an exchange relationship because the perpetuity of losses from continued cheating (Cc) will generally be greater than the search costs of finding a new exchange partner. However, if search costs are high, and the actual losses from cheating are very small, it may pay to persist with a cheating exchange partner - at least in the short term. In the context of the retail illicit drugs market, low cost cheating refers to quality fraud. The decision rule indicates exchange parties may endure low cost cheating, such as quality fraud, rather than search for a new exchange partner.

The reluctance of victims to quit exchange relationships over low cost cheating limits their ability to punish sellers for low cost cheating. They can still complain, or take merchandise back, but satisfaction relies on the willingness of the seller to voluntarily provide compensation or change business practices. The lack of an effective punishment for low cost cheating suggests quality fraud will be much more prevalent than product fraud, robbery, or assault.

The lack of an objective measure of illicit drug quality may lead exchange parties to overstate the incidence of quality fraud. The quality of illicit drugs will be described in broad qualitative terms by the seller, and will be evaluated through subjective personal experience (ie. consumption) by the buyer. Inflated black market prices may produce a general feeling amongst buyers of not receiving value for money. Exchange parties may feel they have been the victim of quality fraud even when no fraud was intended.

Many of the variables in the two decision making rules will be affected by the type of drug involved in a transaction. To generate testable assertions about a specific illicit drug market the variables of the model have to be adapted to the unique conditions in the market. The next chapter adapts the model to the retail cannabis market in New Zealand.

5. Cheating in Retail Cannabis Transactions in New Zealand

5.1 Introduction

Two broad assertions about the reliability of retail illicit drug transactions emerged from the model developed in Chapter 4: (i) product fraud, robbery, and assault, will generally be rare, and (ii) quality fraud will be relatively common.

Investigation of the variables in the decision-making rules indicated many were market specific. They were affected by the type of illicit drug involved in a transaction and the local characteristics of the market. Before any testable assertions about a specific illicit drug market can be generated the model's variables have to be adapted to the unique conditions in that illicit market. This chapter adapts the model to the cannabis market in New Zealand. The testable assertions which are developed are the subject of empirical test in the next chapter.

5.2 The Cannabis Market in New Zealand

Cannabis is the generic name for all the products which can be made from the cannabis plant, *cannabis sativa* (New Zealand Ministry of Health, 1996). The primary psychoactive substance in cannabis is delta-9-tetrahydrocannabinol (THC) (New Zealand Ministry of Health, 1996). There are two common forms of cannabis in New Zealand:

(i) Cannabis plant - the dried leaves, flower heads, and small stalks of the cannabis plant. Cannabis plant generally has a THC level of between 0.5-5%, but can vary between 0.1-10%.

(ii) Hash oil - a viscous or gummy substance made by extracting the soluble material from the cannabis plant and concentrating it in an extract. This is the strongest preparation of cannabis, with a THC content usually between 10-20%, but can vary between 5-50% (New Zealand Ministry of Health, 1996).

Climatic conditions in New Zealand allow cannabis to be grown almost anywhere. The cultivation of a good quality crop requires regular nurturing and some basic horticultural skill. Cannabis requires plenty of sunlight, regular watering, and protection from predators, such as opossums, rats, and slugs (Staff, 1988; Te Runanga, 1995). Cultivation of a commercial crop involves selecting a sunny location for planting, providing a means of irrigation (eg. PVC pipe), and providing a means of pest protection (eg. poison) (Te Runanga, 1995; Walker *et al.*, 1998).

Cannabis is grown in bush and forest areas on both private and public land (Walker *et al.*, 1998). Growers choose to cultivate on land not owned by themselves to avoid the risk of land confiscation if convicted (Walker *et al.*, 1998). The crop has to be camouflaged to avoid detection at ground level by drug thieves, and detection from the air by police helicopters (Staff, 1988; Walker *et al.*, 1998).

Cannabis seeds and seedlings have a high attrition rate in wild areas. A grower will have to sow many hundreds of seeds in wild country to generate a reasonable number of seedlings (Staff, 1988). Only around one in five seedlings will grow into a mature plant (Te Runanga, 1995). Finally, approximately a third of the mature plants will be males, which have very low levels of THC, and consequently have little commercial value (Te Runanga, 1995).

The national survey of drug use in New Zealand carried out by the Alcohol and Public Health Research Unit provides detailed information on levels of illicit and licit drug use in New Zealand. Two national drug surveys have been completed, one in 1990, and one more recently in 1998. The results of these surveys are published in Black and Casswell (1993), and Field and Casswell (1999a), respectively. The results of the two surveys are compared in Field and Casswell (1999b). The proportion of New Zealanders who had ever tried cannabis increased from 43% in 1990, to 52% in 1998 (Field and Casswell, 1999b).[1] Cannabis use was most prevalent in young adults (18-34 years), and higher in men than women, in both surveys (Field and Casswell, 1999b). In the 1998 survey, the highest prevalence of men who had ever tried cannabis was 67% in the 20-24 years age group (Field and Casswell, 1999a). The highest prevalence of women who had ever tried cannabis was 55% in the 25-29 age group (Field and Casswell, 1999a).

The number of people who had tried hash oil was much lower than the number of people who had tried cannabis plant in both surveys (Field and Casswell, 1993b). In the 1998 survey, only 14% of the sample had ever tried hash oil (Field and Casswell, 1999a). Again, the use of hash oil was most common amongst young men.

A significant cannabis economy is known to exist in New Zealand to satisfy the demand for cannabis products. Cannabis provides a lucrative cash crop in rural areas where unemployment is high (New Zealand Ministry of Health, 1996; Walker *et al.*, 1998). The principal growing areas for cannabis in New Zealand are the East Coast (Opotiki), the Coromandel, Northland, and Nelson (New Zealand Ministry of Health, 1996). The Northland area is particularly productive because the sub-tropical climate

[1] The term cannabis refers to cannabis plant, as opposed to hashish oil.

allows two crops to be harvested a year (McLauchlan, 1996). Cannabis is still sold in imperial weights, ounces and pounds (McLauchlan, 1996).

The total annual turnover from the illicit cannabis market is very difficult to estimate. An ounce of cannabis is reported to sell for between $200-500 (Te Runanga, 1995). The price depends on the quality of material (ie. flower heads versus leaf), and the amount of cannabis already on the market (Te Runanga, 1995). A cannabis plant produces between 2 ounces and one pound of cannabis material per season depending on growing conditions and nurturing (Walker *et al.*, 1998). In 1995, the New Zealand Police recovered and destroyed 214,000 plants nationwide (McLauchlan, 1996). Using the prices and production yields quoted above, those 214,000 plants were potentially worth between 85 million and 1.7 billion dollars.[2] The National Organisation for the Reform of Marijuana Laws (NORML) has estimated the Auckland market is worth between $130 to $300 million a year (McLauchlan, 1996). A recent article in the National Business Review estimated New Zealand's cannabis crop to be worth $3 billion dollars a year (Hill, 1998).

New Zealand Ministry of Justice statistics on cannabis offending confirm the popularity of cannabis in New Zealand. Table 5.1 presents the number of convictions for drug offences in New Zealand 1986-1995.

[2] The price of an ounce ranges from $200-500 (retail price), and each plant produces between 2-16 ounces, the minimum value of 214,000 plants is therefore 85 million, and the maximum value is 1.7 billion. Walker *et al.* (1998) use the same method to estimate the value of plants seized in the 1995-96 season.

Table 5.1: Number of Convictions for Drug Offences, 1986-1995

Offence Type	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Use Cannabis	7691	7538	7919	7075	6563	6483	6101	7422	7399	5933
Deal Cannabis	2045	2526	2710	2482	2779	3073	3306	3503	4229	3443
Other Cannabis	1095	1175	1206	998	979	1091	1139	1482	1730	1472
Use Other Drug	437	488	514	493	435	393	325	338	334	389
Deal Other Drug	137	197	215	232	351	348	376	355	381	385
Other Drug	296	401	332	259	192	165	193	165	147	193
Total	11701	12325	12896	11539	11299	11553	11440	13265	14220	11815

Source: New Zealand Ministry of Justice

Cannabis convictions made up between 91-94% of all convictions for drug offences in New Zealand. The number of convictions for the "use of cannabis" fell by 23 percent from 1986 to 1995. In the same period, the number of convictions for "dealing cannabis" (which includes convictions for importation or cultivation) increased by 68 percent. The fall in the number of convictions for the "use of cannabis" may be due to the introduction of the adult pre-trial diversion scheme in 1990. The diversion scheme gives the police the discretion to divert first-time cannabis offenders from the criminal justice system (see Drug Policy Forum Trust, 1997).

5.3 A Transaction Cost Model of the Reliability of Retail Illicit Cannabis Transactions

The reliability of retail illicit drug transactions was based on the understanding that exchange partners would meet again and again in the future. When interaction is ongoing it is often rational to voluntarily cooperate because the ongoing benefits from future cooperation are generally greater than the one-off benefit from cheating (Axelrod,

1981; 1990). Illicit drug consumption was held to involve ongoing transactions because illicit drugs are consumer goods, and their euphoric and addictive qualities encouraged regular consumption. High search costs in a market also create an expectation of repeat interaction with the same exchange partner (Geertz, 1978: 1979).

Studies of cannabis use in New Zealand confirm the regular and ongoing nature of cannabis consumption. The national surveys of drug use in New Zealand found the frequency of cannabis use did not change markedly from 1990 to 1998 (Field and Casswell, 1999b). About a quarter of the men who had used cannabis in the last year used it 40 or more times, and about one half used it 10 times or more (Field and Casswell, 1999b). Women used cannabis less frequently but still on a fairly regular basis (Field and Casswell, 1999b). Poulton *et al.* (1997) tracked the frequency of cannabis use amongst a group of New Zealand young people at age 15, 18, and 21. In the period of the study, "new cases of cannabis use," and an "increase in cannabis use," were more common than either "remission" or "decrease in use." Eighty-four percent of those using cannabis frequently at age 15 were using it frequently at age 21 (Poulton *et al.*, 1997).

Chapter 4 added search costs to the decision to cheat on a transaction in a competitive market. An exchange partner should cheat if the expected one-off benefit of cheating is greater than the search costs of finding a new exchange partner. The decision to cheat is presented in equation (4.3)

$$p.(Bc) > Sx + \sum_{t=1}^{n} Be^{t} / (1+r)^{t} + q.(U) + v.(T) \qquad (4.3)$$

where Be = the benefit of exchange

Bc = the benefit of cheating

r = discount rate

Sx = search expenditures

n = the number of periods before a new exchange partner is found

q = the extra risk of arrest during search

U = the disutility of the legal penalty for a drug offence

v = the extra risk of victimisation during search

T = the value of property lost from cheating

Analysis of the illicit drugs market suggested it will often be rational to voluntarily honour the terms of transaction because the one-off benefit of cheating is often low, while the search costs of finding a new exchange partner are often high. Product fraud, robbery, and assault would generally be rare.

An exchange partner should persist with a cheating exchange partner if the search costs of finding a new exchange are higher than the ongoing costs of cheating. The decision to persist with a cheating exchange partner is presented in equation (5.3).

$$Sx + \sum_{t=1}^{n} Be^{t} / (1+r)^{t} + q.(U) + v.(T) > Cc / r \qquad (5.3)$$

where

Cc = losses of ongoing cheating

Analysis of the illicit drugs market suggested exchange parties would be reluctant to quit exchange relationships over low cost cheating such as quality fraud. Quality fraud would be much more prevalent than product fraud, robbery, and assault.

Many of the variables in the above decision making rules were found to depend on the type of drug involved in a transaction, and the characteristics of the local market. The following sections discuss these variables in the context of the cannabis market in New Zealand.

5.4 The Extra Risk of Arrest during Search (q)

New unattached exchange partners were held to be more risky than established exchange partners (see Moore, 1977; Akerlof, 1970). The pool of unattached exchange partners is naturally disproportionately populated with undercover agents and unreliable exchange partners (ie. the rejects from other dealers). Reliable exchange partners are driven from the pool of unattached exchange partners by the poor exchange terms offered to new exchange partners. The general risk of arrest during search was held to be low because drug transactions are "victimless" crimes, and exchange parties can

employ simply but effective security strategies to avoid detection. The police must rely on the willingness of the public to report cannabis offences and the work of undercover police to detect cannabis offences.

The willingness of the public to report drug offences is undermined by the time required to make a complaint to the police, divided public opinion and peer pressure about the fairness of drug laws, and the risk of retribution from those reported. The inclination of the general public to report cannabis offences is likely to be particularly weak. Cannabis is widely viewed as the least harmful of the illicit drugs (Kuhn *et al.*, 1998; Drug Policy Forum Trust, 1997). Consequently, its prohibition is viewed as the most controversial (see Drug Policy Forum Trust, 1997). Cannabis is the drug which is most often discussed with respect to relaxing prohibition laws. Several states in Australia presently operate liberalised cannabis policies, as did several states in the United States during the 1970's (see Brecher, 1972; Drug Policy Forum Trust, 1997). There have been reports of retribution for interfering in cannabis cultivation in the Northland Region (see Walker *et al.*, 1998).

Public perceptions of cannabis use and cannabis offences were sought in the national drug surveys carried out by the Alcohol and Public Health Research Unit. Perceptions of the risk of harm from cannabis use did not change markedly between the 1990 survey and the 1998 survey (Field and Casswell, 1999b). Respondents thought there was a greater risk from smoking tobacco than smoking cannabis (Field and Casswell, 1999b). In the 1998 survey, 18% of people thought there was a "great risk of harm" from smoking cannabis once or twice, compared to 24% of people who thought there was a "great risk of harm" from smoking tobacco once or twice. Seventy-three percent of people thought there was a "great risk of harm" from regular cannabis use, compared to 85% of people who thought there was a "great risk of harm" from regular tobacco

use (Field and Casswell, 1999a). In both surveys, the 20-45 year age group thought, alcohol use, tobacco use, solvent use, and the use of other illicit drugs, were all more serious problems to the community than cannabis use (Black and Casswell, 1993; Field and Casswell, 1999a).

Respondents were asked their views about the current level of drug enforcement for different drug types. Again, the responses from the 1998 survey did not change markedly from the 1990 survey (Field and Casswell, 1999b). There were strong differences in perception of drug enforcement between "using cannabis," and using other illegal drugs and selling drugs (including cannabis) (Field and Casswell, 1999a). In the 1998 survey, 30% of people thought the penalties for the possession of cannabis were too heavy, 35% thought they were about right, and 21% thought they were too light, and 14% did not know. In the case of selling cannabis, using other illegal drugs, and selling other illegal drugs, less than 10% thought the penalties were too heavy, less than 30% thought they were about right, and greater than 45% thought they were too light.

The New Zealand police appear to view the use of cannabis as a relatively low priority. The head of the Whangarei Drug Squad, Pat Coghlan, is quoted as saying:

"As to the seriousness of marijuana itself, drugs fall into three classes. Now obviously when there is class A around (heroin, LSD, and the newly regulated cocaine) we take that as our priority, then comes Class B (hashish, morphine, pills) and finally class C [cannabis plant]." (my explanation in final bracket, Staff, 1988, p.107)

In a more recent article, the senior sergeant of Kaitaia[3] commented:

"It's a matter of priorities. Do we nail someone smoking cannabis in a car park or do we use our resources to stop domestic violence and drink-driving? Cannabis is the lesser of many evils." (McLauchlan, 1996, p.122)

Cannabis buyers and sellers can reduce the risk of arrest during search by being discreet and selective about cannabis enquires, and by only transacting with people they know or who are guaranteed by others.

5.5 The Disutility of the Legal Penalty for a Drug Offence (U)

The legal penalties for drug offences in New Zealand are found in the *Misuse of Drugs Act 1975*. The penalty structure of the *Misuse of Drugs Act 1975* was discussed in detail in the previous chapter. Penalties for cannabis offences are light compared to penalties for "harder" drugs, such as cocaine and heroin. In its unprocessed plant form cannabis is classified as a Class C drug. If the cannabis has been processed into hashish oil, or its psychoactive constituent has been isolated (ie. pure THC), it is classified as a Class B drug. The maximum penalty for the use of a Class C drug is a fine not exceeding $500, unless there are previous convictions or exceptional circumstances, then imprisonment not exceeding 3 months (see Table 4.1). The maximum penalty for the use of a Class B drug is imprisonment not exceeding 3 months or a fine not exceeding $500 or both. The maximum penalty for the supply of a

[3] Kaitaia is located in an area of New Zealand where there is significant cannabis cultivation.

Class C drug is imprisonment not exceeding 8 years. The maximum penalty for the supply of a Class B drug is imprisonment not exceeding 14 years.

Actual sentences rarely reach the maximums set by the Act (see Tables 4.2, 4.3, 4.4). The penalty for possession of cannabis plant for personal use is usually only a fine or community based sentence. According to New Zealand Ministry of Justice statistics, between 1986-1995, only between 1-3% of cases for the "use of cannabis" resulted in a custodial sentence (New Zealand Ministry of Justice, 1986-1995). The average length of custodial sentence for the "use of cannabis" ranged from 1.2 to 2.0 months (New Zealand Ministry of Justice, 1986-1995). The penalty for "dealing cannabis" also often only results in a fine or community based sentence. Only between 10-16% of cases for "dealing cannabis" resulted in a custodial sentence (New Zealand Ministry of Justice, 1986-1995). The average length of custodial sentence ranged from 8.5 to 13.9 months (New Zealand Ministry of Justice, 1986-1995).

5.6 The Extra Risk of Victimisation during Search (v)

The high price of many illicit drugs is often viewed as a compulsion to cheat on transactions (see Michaels, 1987; Goldstein, 1985: 1989). Exchange parties are forced to cheat on transactions to finance their drug use. The economic compulsion to cheat is much reduced in the case of cannabis. Cannabis is a relatively cheap illicit drug and does not create a physical addiction (Byck, 1987; Kuhn *et al.*, 1998). Users are able to moderate their cannabis consumption to fit their financial circumstances.

Enough cannabis for 3-4 cigarettes can be purchased for $20-40 (McLauchlan, 1996; Black and Casswell, 1993; Field and Casswell, 1999a). Given the cannabis consumption patterns described in the national surveys of drug use in New Zealand, this would be enough cannabis to satisfy the vast majority of users for 3-4 weeks or

more (see Field and Casswell, 1999b).[4] The financial pressures of cannabis use appear manageable even for those on low incomes. Cannabis use would not ordinarily require users to commit acts of robbery and theft to finance their consumption.

5.7 The Value of Property Lost from Cheating (T)

The value of the property lost from cheating is a function of the type of cheating carried out and the value of the property involved. Quality fraud merely redefines and redistributes the surplus from exchange in favour of the seller, while product fraud and robbery actually transfer the wealth of a transaction from one exchange partner to the other. The value of illicit drug transactions were held to be constrained by the financial difficulties with buying illicit drugs in large quantities, the risk of robbery and "rip-off," and the penalty structure of the *Misuse of Drugs Act 1975* and its judicial interpretation

The prohibition of cannabis significantly inflates the price of cannabis. Thornton (1991) claims the price of an ounce of cannabis is well over one hundred times the price of an equal weight of cigarettes. Inflated prices reduce the quantity of the drug consumers are willing to buy. Purchases of cannabis must also be made from current disposable income, no credit facilities are available. This restricts the amount of cannabis that can be purchased at any one time.

Exchange parties in illicit drug markets are vulnerable to robbery and "rip-off." Robbery and product fraud impose significant losses on exchange parties. Exchange parties can effectively minimise the potential losses from victimisation by purchasing

[4] Recall, about one quarter of men who had used cannabis in the last year had used it 40 times or more (once every 9 days), and about one-half had used it 10 times or more (once every 36 days), the rest at lower frequencies.

drugs in small quantities. Low value purchases of cannabis are a low risk way to gain information on the quality of cannabis and the integrity of cannabis sellers.

The financial size of illicit cannabis transactions are also constrained by the penalty structure of the *Misuse of Drugs Act 1975* and its judicial interpretation. The weight of cannabis found on a offender is sufficient to establish the "presumption of supply." Presumption of supply reverses the burden of proof in favour of the prosecution. Section 6 (6) (d-e) of the *Misuse of Drugs Act 1975* states, if an offender is caught with two hundred and fifty milligrams or more of tetrahydrocannabinol (THC), five grams or more of cannabis preparation (commonly referred to as hashish or cannabis oil), 28 grams or more of cannabis plant, or 100 or more cigarettes containing cannabis preparation or cannabis plant, they are presumed to be in possession of cannabis for the purposes of supply.

The distinction between possession of cannabis for "personal use" versus possession for "supply" is significant. The maximum penalty for the use of cannabis plant is a fine of up to $500 or 3 months imprisonment or both. The judge is only directed to impose a custodial sentence if previous convictions or other exceptional circumstances warrant it. The penalty for the supply of cannabis plant, on the other hand, is up to 8 years imprisonment. New Zealand Ministry of Justice statistics indicate a custodial sentence is much more likely for "dealing cannabis" than for the "use of cannabis" (see Table 4.3). In the period from 1986-1995, only between 1-3% of cases involving the "use of cannabis" resulted in a custodial sentence, compared to between 10-16% of cases involving "dealing cannabis" (New Zealand Ministry of Justice, 1986-1995). The average length of custodial sentence is also much higher for dealing offences compared to use offences (see Table 4.4). The average length of custodial sentence for the use of

cannabis was 1.2-2.0 months compared with 8.5-13.9 months for dealing cannabis (New Zealand Ministry of Justice, 1986-1995).

The weight of cannabis found on an offender is also used by the courts as a guideline for sentencing within the ranges set by the *Misuse of Drugs Act 1975* (see Mathias, 1988). Seizures of 6 and 9 pounds of cannabis plant have received sentences of 2 and 3 years respectively, while seizures of 1 kilogram and 850 grams of cannabis have received sentences of one year and three months, and one year, respectively (Mathias, 1988). In *Dutch*, the Court of Appeal outlined three broad divisions of offending for the cultivation of cannabis based on the size of crop:

"1. At the lowest level of culpability are the cases where the offender has cultivated a few plants on his own property exclusively for his own use. Sentences for cultivation to that extent have not been considered by this Court, as obviously they will normally be dealt with by a fine or some other form of non-custodial penalty in the District Courts.....

2. The second class of offending involves cultivation for commercial purposes where there will be a large number of plants, running into scores or hundreds, very often growing in a small prepared plot of ground in a remote region, and accompanied by the object of deriving a substantial profit from harvesting and sale. Such cases are normally of the type which involve small ventures engaged upon for the purpose of generating a substantial profit on one occasion only...a sentence of imprisonment must be the ordinary result and...the severity of sentence will in general vary in accordance with the size of the crop under cultivation.....

3. The third and most serious class of offence of cultivating cannabis is represented by the cases where cultivation is on a very large scale normally involving 1000 plants or more. This measure of cultivation is sometimes effected by converting a large building into a hot-house equipped with sophisticated cultivation aids of the type used in *Mc Nabs* case [1350 plants in woolshed lined with aluminium foil, with heaters, fluorescent lights, and irrigation plant and the like, in a project which appeared to have been designed to operate over an extensive period of time: five years imprisonment] and where such installations may appear to disclose either intent or ability to use the established system of cultivation as a continuing operation. But cultivation on a similarly large scale may also be achieved by outdoor plantations in remote areas, as in the case of Rose and Finlayson [at least 1,865 plants, valued at about $85,000, first offenders: three and a half years and four years imprisonment], and we see no difference in the methods employed where the expected harvest is estimated to realise financial returns of $50,000, 100,000 or more." (Mathias, 1988)

The Court of Appeal uses a number of cases to illustrate the important role crop size plays in sentencing (Mathias, 1988). In *Collins* the cultivation of 130 cannabis plants received a sentence of one and half years, while in *Skiadas* the cultivation of 489 plants and 83 seedlings received a sentence of two and a half years (Mathias, 1988). In *McNab* the cultivation of 1,350 plants received a sentence of five years, and in *Rose and Finlayson* the cultivation of 1,865 plants received a sentence of three and a half years and four years respectively (Mathias, 1988).

To avoid being charged with the "supply of cannabis" exchange parties should be careful not to have in their possession an amount of cannabis greater than the limits set by the *Misuse of Drugs Act 1975.* In the case of cannabis plant, the limit is less than 28 grams (ie. one ounce). The maximum purchase of cannabis plant (ie. assuming no existing inventory) would therefore be one ounce, which has a value of between $200-500 (Te Runanga, 1995; Black and Casswell, 1993).

Common units of cannabis sale in New Zealand are 'bullets' (1-2 grams) and 'ounces' (approx. 28 grams). Field and Casswell (1999b) suggest the price of cannabis has fallen between 1990 and 1998 (Field and Casswell, 1999b). In the 1990 survey, the average price for a bullet of cannabis was $40, and the average price for an ounce was $222 (Black and Casswell, 1993). In the 1998 survey, the average price for a 'bullet' was $24, and the average price for an ounce was $122 (Field and Casswell, 1999a).

5.8 The Benefits of Cannabis Exchange (Be)

The benefits of illicit drug exchange are represented by the respective exchange surplus from a transaction. The more inelastic the demand and supply for illicit drugs the larger will the respective exchange surplus from a transaction. The demand for illicit drugs is widely held to be relatively inelastic because illicit drugs tend to be addictive and there

are few substitutes for illegal psychoactive substances (Stevenson, 1994). In Chapter 4, it was argued the supply of illicit drugs at retail level would also be relatively inelastic because of the informational barriers to entry into drug dealing, and the risk of transactions.

The cannabis prices quoted by Long (1988) confirmed the profitable nature of cannabis dealing in the United States (see Table 4.6). Profit is made by reselling cannabis in smaller weights at a higher unit price, and by selling underweight bags of cannabis. Twenty 'volume' bags[5] are made from a pound instead of sixteen full ounce bags. Using Long's (1988) figures it was calculated cannabis dealers earn a 60% gross profit margin from the repackaged resale of cannabis.

Prices for cannabis in New Zealand suggest gross profit margins of roughly 100% from cannabis dealing.[6] A pound of cannabis can be purchased for between $1500-3500 (Te Runanga, 1995). A pound can be divided into 16 one ounce lots. An ounce sells for between $200-500 (Te Runanga, 1995; Black and Casswell, 1993). The ounce dealer therefore earns between $3200-8000 per pound, which is roughly double the price of the original pound. An ounce can then be divided into 28 one gram "bullets," each selling for between $20-40 (Black and Casswell; 1993; Field and Casswell, 1999a). The "bullet" dealer therefore earns between $560-1120 per ounce, which again is roughly double the price of the original ounce.

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[5] Making up "volume" bags means making a certain number of bags of equal volume rather than individual bags of a specific weight.

[6] It is difficult to think of any significant direct costs involved in drug dealing. No office or store space is required, and no staff are needed. The most significant cost of dealing appears to be the time spent arranging transactions. The risk of victimisation and the risk of arrest and time spent in prison are significant indirect costs of drug dealing (see Reuter et al., 1990)

5.9 The Discount Rate (r)

The discount rate represents how exchange parties value the future (Pearce and Turner, 1990). In the case of ongoing interaction the discount rate also includes the likelihood exchange parties will meet again in the future (Axelrod, 1990). The main source of risk and uncertainty in the illicit drugs market are the effects of drug intoxication and drug withdrawal on exchange partners, the risk of arrest by the authorities, and the risk of victimisation by exchange partners and competitors. Drug intoxication and drug withdrawal can lead to irrational short term decision-making and violence. Market risk can encourage exchange parties to adopt short term operating behaviours.

Cannabis consumption only produces a mild level of euphoria (Drugs Advisory Committee, 1995). The most common method of consumption is smoking (New Zealand Ministry of Health, 1996). Cannabis is inhaled deeply and held for several seconds in the lungs to attain the maximum amount of THC absorption (New Zealand Ministry of Health, 1996). The New Zealand Ministry of Health (1996) report on cannabis describes cannabis intoxication as:

> "....an altered state of consciousness characterised by mild euphoria, relaxation, and perceptual alterations, including time distortion and intensification of ordinary sensory experiences, such as eating, watching films, and listening to music. When used in a social setting, the drug often produces infectious laughter and talkativeness." (p.7)

Cannabis intoxication impairs information processing, attention span, and memory retention (Drugs Advisory Committee, 1995). Users remain intoxicated for 2-3 hours (Kuhn *et al.*, 1998). Regular cannabis use can have a negative impact on interpersonal relationships and ability to communicate and concentrate on tasks, such as parenting (Drugs Advisory Committee, 1995). Cannabis use may accelerate symptoms of

schizophrenia in those already susceptible to the condition (New Zealand Ministry of Health, 1996). Cannabis does not induce violent behaviour (Goldstein, 1989; Drug Policy Forum Trust, 1997; Kuhn *et al.*, 1998). In a review of the medical literature on the link between drug use and violence, Goldstein (1989) classifies cannabis as one of the drugs which actually reduces violent tendencies. Cannabis does not create a physical addiction (Byck, 1987; Kuhn *et al.*, 1998). Heavy long term use has been linked to a mild form of psychological dependency in some users (Drugs Advisory Committee, 1995; Kuhn *et al.*, 1998). The New Zealand Ministry of Health (1996) report the health risk of cannabis concludes:

"Overall, the relative risk of occasional cannabis use appears to be minor. The relative risk to long-term, heavy users is more significant." (p.28)

The national surveys of drug use in New Zealand suggest moderate cannabis consumption is the predominant pattern of use. The frequency of cannabis use did not change markedly from 1990 to 1998 (Field and Casswell, 1999b). There were two broad frequencies of consumption, very occasional use (ie. once or twice a year), and more regular use (ie. 40+ a year). Daily use (ie. 20-39 times every 30 days) or greater than daily use (ie. 40+ times every 30 days) was rare (Black and Casswell, 1993; Field and Casswell 1999a). In both surveys the average amount of cannabis consumed on a typical occasion was 0.7 cannabis cigarettes per person for men, and 0.5 cannabis cigarettes per person for women (Field and Casswell, 1999b).[7]

The Black and Casswell (1993) survey found the majority of those who had tried cannabis experienced no problems from their use. The most commonly reported problems were adverse effects on general physical health (4% people who had ever

[7] Respondents consumed fractions of cigarettes because one cigarette was often smoked by several people.

tried cannabis), memory loss (4%), and loss of motivation or energy (4%). Frequent users (ie. those who had used cannabis more than ten times in the last 30 days) reported only slightly more problems. The most common physical problem was memory loss (10%), loss of motivation and energy (9%) and general physical health (7%).

The low legal penalties for cannabis offences suggest the police will place a low priority on apprehending cannabis users and low level dealers. This view is supported by police statements in the *North & South* articles quoted in section 5.4 (Staff, 1988; McLauchlan, 1996). The legal penalties for cannabis offences are relatively moderate. A conviction for the "use" of cannabis plant usually only results in a fine or community based sentence (New Zealand Ministry of Justice, 1986-1995). Dealing cannabis also often only results in a fine or community based sentence (New Zealand Ministry of Justice, 1986-1995).

The lighter legal penalties for cannabis offences put cannabis dealers under much less legal pressure than heroin and cocaine dealers. They are therefore less likely to adopt short term operating behaviours which encourage cheating. This understanding of the moderate legal pressures of cannabis dealing is supported by the nonchalant way one grower described the legal risk of cannabis cultivation:

"I don't really mind the police aspect, I look on it like driving a car, if you want to go fast, you accept the consequences if you run into a radar cop around the corner." (Staff, 1988, p.103-4).

Drug dealers and drug users also face the risk of victimisation by exchange partners. The economic compulsion to cheat exchange parties is much reduced in the case of

cannabis because cannabis is a relatively cheap illicit drug and it does not create a physical addiction.

Finally, exchange parties must consider the probability of meeting an exchange partner again in the future. High search costs in a market create expectations of repeat exchange (Geertz, 1979). Exchange parties can economise on the high search costs in a market by returning to an established exchange partner.

5.10 The Number of Periods before a New Exchange Partner is Found (n)

Finding exchange partners in illicit drug markets is time consuming because illicit drug markets are fairly small, exchange parties are secretive and suspicious, and there are no market institutions to assist exchange parties with finding exchange partners (eg. advertising, prominent store locations) (see section 4.10.1). A reputation for cheating will further extend the time it takes to find a new exchange partner.

The size of an illicit drug market is determined by the number of current users who buy their drugs in the illicit market. Although 52% of New Zealanders aged 15-45 have tried cannabis, only 15% are current users (ie. used in the last 12 months and had not stopped) (Field and Casswell, 1999a). Several studies of cannabis in New Zealand have found many users receive cannabis for free at social gatherings, or through personal relationships, rather than purchase it on the illicit market (Te Runanga, 1995; Black and Casswell, 1993; Field and Casswell, 1999a). In the Field and Casswell (1999a) survey, 42% of current cannabis users indicated they received "all" of their cannabis for free, with 65% receiving "most or all" of their cannabis in this way. In a separate question, only 36% of current cannabis users bought at least some of their cannabis (Field and Casswell, 1999a). A very similar picture of acquisition was found

in the 1990 survey (Black and Casswell, 1993). Although 52% of New Zealanders have tried cannabis, only 15% are current users, of which only approximately 4% buy at least some of their cannabis in the illicit market.

5.11 The Benefit of Cheating (Bc)

The value of the property gained from cheating is a function of the type of cheating carried out and the value of the property involved. The value of the property gained from cheating is determined by the same factors which determine the value of the property lost from cheating (see section 4.9.3). The value of the property gained from cheating will be constrained by the low value of retail illicit drug transactions (see section 4.9.3.3). Common units of cannabis sale in New Zealand are 'bullets' ($20-40) and 'ounces' ($200-500).

5.12 The Probability of Successful Cheating (p)

In chapter 4, it was argued the probability of successful cheating in illicit drug transactions would be fairly high. The speed of illicit transactions, the absence of product information, the absence (or inaccuracy) of measurement technology, the physical complexity of illicit drugs, and the impracticality of product sampling in many instances, meant buyers would not generally not be able to verify the value of drugs before completing a transaction. Not all of these reasons are relevant with cannabis.

The illegality of the cannabis market does prevent advertising, branding, standardised packaging, and product labelling. Cannabis prohibition also restricts the development and availability of measurement technology to measure the quality of cannabis. There is no accessible consumer test of THC concentration. However, the physical

characteristics of cannabis are likely to increase the effectiveness of physical inspection, and the practicality of sampling.

Unlike many illicit drugs cannabis is not a chemical concentrate (New Zealand Customs Department, 1980; Kuhn *et al.*, 1998). In its plant form the only processing which takes place is drying (Alder, 1985; New Zealand Customs Department, 1980; Kuhn *et al.*, 1998). This significantly increases the effectiveness of physical inspection as a means to measure value and detect cheating. Cannabis plant has a distinctive smell, colour, and leaf shape (Alder, 1985; New Zealand Customs Department; Kuhn *et al.*, 1998). This will make it easier to detect a completely fraudulent substance. The flower heads of the cannabis plant are known to contain the highest concentration of THC (Alder, 1985; Te Runanga, 1995; Kuhn *et al.*, 1998). The size and number of these heads can provide a good indication of cannabis quality. Alder (1985) explains:

"To command top value, marijuana had to have well-shaped, intact buds, devoid of seeds, stems and shake, be exotically colored (gold, reddish, or pale green as opposed to brown or dark green) with distinct red "hairs" covering the other portions of the buds, and be pleasantly fragrant." (p.47)

Furthermore, unlike heroin and cocaine, cannabis is not diluted with an additive. This means the weight of cannabis will bear a closer relationship to its value.

Sampling is also more practical with cannabis than with many other illicit drugs. Sampling was held to be impractical in many instances because of the debilitating effects of a drug. The advantage with sampling cannabis is its effects are relatively mild (Drugs Advisory Committee, 1995).

The increased effectiveness of physical inspection, and the greater practicality of sampling, suggest it will be easier to detect cheating in cannabis transactions than other illicit drug transactions. A lower probability of successful cheating (p) will reduce the expected benefits of cheating.

5.13 Conclusion

This chapter has adapted the variables of the model to the specific conditions in the retail cannabis market in New Zealand. Inevitably, the cannabis market in New Zealand has been compared with the heroin and cocaine markets in the United States discussed in the previous chapter. Analysis of the cannabis market in New Zealand indicates it will often be rational to voluntarily honour the terms of retail transactions. The expected one-off benefit of cheating is particularly low because the physical characteristics of cannabis reduce the probability of successful cheating (p). The distinctive smell, colour, and leaf shape of cannabis will make product fraud relatively easy to detect. The high concentration of THC in the flower heads of cannabis will provide an effective means to measure the quality of cannabis. The benefits of cheating (Bc) are restricted by the penalty structure of the *Misuse of Drugs Act 1975* to a maximum value of $500 or less. Common units of cannabis sale are $20-40 'bullets' and $200-500 'ounces' (Te Runanga, 1995; McLauchlan, 1996; Black and Casswell, 1993; Field and Casswell, 1999a; 1999b).

Search costs will be high in the retail cannabis market. The risk of arrest during search will be lower in the cannabis market than the cocaine and heroin markets because of divided public opinion about the seriousness of cannabis offences, and the low priority the police place on retail cannabis offences. The disutility of the legal penalty for a drug offence (U) in the cannabis market is relatively low because of the moderate penalties for cannabis offences. The risk of victimisation (v) is likely to be lower in the cannabis

market than the cocaine and heroin markets because cannabis is relatively cheap, and it does not create a physical addiction. The value of the property lost from cheating (T) will be constrained by the low value of cannabis transactions. The expected loss of exchange during search is likely to be significant. Gross profit margins from cannabis dealing in New Zealand suggest the benefits of cannabis exchange (Be) are high. It will often take a long time to find a new exchange partner (n) in the cannabis market. Exchange parties are still secretive and suspicious, and there are still no advanced market institutions to assist exchange parties with finding exchange partners (eg. advertising, prominent stores locations). Although a large proportion of the New Zealand population has tried cannabis (52%), only a small minority are current users who actually purchase cannabis in the illicit market (5%) (see Black and Casswell, 1993; Field and Casswell 1999a). The discount rate (r) is likely to be low because of the relatively benign effects of cannabis consumption, and the relatively low risk of arrest and victimisation.

Search costs remain high enough to make it rational for exchange parties to endure low cost cheating, such as quality fraud, rather than quit an exchange relationship and search out a new exchange partner. The lack of an effective punishment for quality fraud, high black market prices, and the lack of a precise measure of cannabis quality, will further increase the incidence of quality fraud.

5.14 Testable Assertions

5.14.1 Introduction

The model can be used to develop a number of testable assertions about the cannabis market in New Zealand. This section states these assertions explicitly and explains the methodology to be used to test their validity. Data on the cannabis market in New

Zealand was collected using a postal questionnaire. The objective of the questionnaire was to measure the level of cheating in the cannabis market in New Zealand, and to identify the important variables in the decision not to cheat on cannabis transactions The final part of the section discusses the questionnaire design.

The first group of assertions are concerned with the reliability of cannabis transactions. The next group of assertions are concerned with the reasons why exchange parties do not cheat on transactions. The final group of assertions are concerned with the characteristics of the cannabis market.

5.14.2 Level of Cheating

(i) Assault will be rare

(ii) Robbery will be rare

(ii) Product fraud will be rare

(ii) Quality fraud will be relatively common

(iii) Buyers will respond to cheating by changing sellers or by doing nothing, rather than with violence

A range of statistical analysis was used to test the assertions about the reliability of cannabis transactions in New Zealand. The questionnaire collected data on the number of times respondents have suffered quality fraud, product fraud, robbery, and assault. The first indication of the reliability of the market will be the percentage of

respondents who have never been cheated, and percentage of respondents who have only been cheated 1-2 times ever.

Respondents will have been purchasing cannabis for different lengths of time. A high number of incidents of cheating may still indicate a relatively reliable market if the buyer had been purchasing cannabis for a very long period of time. Alternatively, a low number of incidents of cheating may actually represent a relatively unreliable market if the buyer has only been purchasing cannabis for short period of time. Total incidents of cheating can be calculated into an average incidence of cheating per year per buyer by dividing the total incidents of cheating by the number of years a buyer has been purchasing cannabis. Three levels of average cheating per year will be used as benchmarks, less 0.1 times per year (ie. less than 1 incident in 10 years), less than 1 time per year, and greater than 5 times per year. The average level of cheating per year for the whole sample will also be calculated.

The average level of cheating for the whole sample can be used to calculate the number of incidents of cheating per 100 people. This is a standard form of crime statistic (see Statistics New Zealand, 1996a). The level of cheating (per 100 people) in the cannabis market can then be compared with the level of similar offences (per 100 people) in New Zealand as a whole.

There are two sources of statistics on crime in New Zealand, New Zealand police statistics, and surveys of criminal victimisation (see Statistics New Zealand, 1996a). Both sources have their limitations. It is generally agreed police statistics under-represent the level of crime in society (Young *et al.*, 1997). Police statistics only record crimes which are reported to the police, or are discovered by the police (Young *et al.*, 1997). Victims may not report an offence because they consider it too trivial or

believe the police can do little to help them (Statistics New Zealand, 1996). A recent national survey of victimisation in New Zealand found only about 40% of offences were reported to the police (Young *et al.*, 1997). There was considerable variation in rates of reporting between types of offence. Nearly 90% of theft or unlawful taking of a motor vehicles were reported, in contrast to only a quarter of damage offences, and a third of assault offences (Young *et al.*, 1997). Of the offences that do come to the notice of the police, a considerable number are not recorded (Young *et al.*, 1997). There are a number of reasons why offences are not recorded including, the police consider the complaint to be fabricated or mistaken, they thought the evidence insufficient to substantiate an offence, or they may have considered the offence too trivial (Young *et al.*, 1997). Again, there is considerable variation in the level of recording offences between types of offence. Eighty percent of the burglaries were recorded, compared to less than half of the reported damage offences, and less than a third of reported thefts inside and outside the home (Young *et al.*, 1997). Uncertainty about the rate of reporting and level of recording offences makes it difficult to know whether a reported increase in a type of offence is due to an actual increase in the offence in the community, or merely to improved police detection, more precise police procedure, or a greater willingness of the public to report a type of offence (Statistics New Zealand, 1996a). There are a range of social and demographic variables that influence the level and type of offending in a particular place at different times, such as population density, age structure, gender, ethnicity, educational status, income and employment (Statistics New Zealand, 1996a).

Surveys of victimisation also have their limitations. A frequent criticism of victimisation surveys is they "over count" the level of crime (Young *et al.*, 1997). Victimisation surveys involve a telephone interview where respondents are asked about the incidents of victimisation they have suffered. Unlike the police, who rely on

evidence to determine if an offence has actually been committed, interviewers must take what the respondent says at face value. For a number of reasons this can lead to an inflation in the number and seriousness of offences reported. The extent of over reporting can be minimised if the reported facts of the incident are scrutinised by the interviewer to determine if they fit the legal definition of an offence (see Young *et al.*, 1997). Victimisation surveys are also limited in their coverage (Young *et al.*, 1997; Statistics New Zealand, 1996a). They do not record offences where there is no complaining victim, for example drug use, prostitution, or illegal gambling. Victimisation surveys can suffer from a number of methodological problems including, sampling error when dealing with offences with very low incidences (eg. robbery), low response rates, invention or inflation of incidents, problems with accuracy of recall, and non-disclosure of certain types of offence (eg. sexual offending) (Young *et al.*, 1997; Statistics New Zealand, 1996a).

Police statistics and victimisation surveys can be used to produce a range of number of offences (per 100 people) for each type of cheating, with police statistics setting the minimum of the range and victimisation surveys setting the maximum. The victimisation surveys used in this study are the three surveys included in the recent Statistics New Zealand summary of crime in New Zealand, and a more recent survey carried out by Young *et al.* (1997) (see, MRL, 1993; 1995; Police Survey, 1991; Luketina, 1993).

National crime statistics can only provide a very broad basis for comparison with the cannabis market. Ideally, the level of cheating in the cannabis market should be compared with the level of cheating in a legal market for a similar type product, for example alcohol or tobacco. Unfortunately, comparative statistics of this type do not exist (see Statistics New Zealand, 1996a). Some precision in comparison is achieved

by the categories of offence available, for example the offence category "Robbery" does not include burglary or theft, and "Assault" does not include kidnapping and adduction (see Statistics New Zealand, 1996a). Domestic assaults are sometimes distinguished from the traditional categories of assault (ie. Minor, Serious, Grievous) (see Statistics New Zealand, 1996a). Where a distinction has been made domestic assaults have not been included in the offence range.

The offence categories chosen (ie. fraud, robbery and assault) are likely to include incidents that are not related to a market transaction. Not all fraud will be related to a financial transaction. Many robberies and assaults will have nothing to do with market transactions. Even when an offence is further categorised according to context, this is generally not detailed enough to separate market situations from non-market situations. Violent offences are sometimes categorised according to the location of the offence, for example, Pub/Club, Public Place, Street, Home-based (see Young *et al.*, 1997). This additional information cannot be used to increase the precision of the national statistics because legal transactions could conceivable be conducted in any one of these locations. Moves to reduce the national offence rates on the basis of incomplete information on context are likely to be viewed as an attempt to improve the comparison with the illicit market.

Table 5.1 presents the range of number of offences (per 100 people) in New Zealand for the three types of cheating, fraud, robbery, and assault. None of the sources make the distinction between product fraud and quality fraud. The final column presents the range of number of offences (per 100 people) using all the sources as lower and upper limits.

Table 5.2: Statistics on the Number of Offences (per 100 people) in New Zealand, 1991-1997

	Police Statistics (1995)	Police Survey (1991)	International Survey (1995)	MRL (1995)	Young et al. (1997)	Offending Range
Assault	0.75[8]	4.0	5.0	9.0[9]	13.4[10]	0.75 - 13.4
Robbery	0.05	1.0	1.0	-	0.6	0.05 - 1.0
Fraud	0.96	-	7.0	-	-	0.96 - 7.0

A level of cheating in the cannabis market below the minimum of the range of offences for New Zealand suggests the cannabis market is more reliable than New Zealand society as a whole. A level of cheating in the cannabis market above the maximum of the range of offences for New Zealand suggests the cannabis market is less reliable than the New Zealand society as a whole. Police statistics under-represent the number of offences so a level of cheating in the cannabis market within the range of offences for New Zealand, but close to the police statistics, suggests a relatively reliable cannabis market. Victimisation surveys, on the other hand, tend to overestimate the number of offences so a level of cheating in the cannabis market within the range of offences for New Zealand, but close to the victimisation statistics, suggests a relatively unreliable cannabis market.

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[8] This is the 1996 figure for minor assaults, major assaults, and grevious assaults, less the serious assaults which are "Assault by male on female" (ie. domestic assaults) (Statistics New Zealand, 1996a; 1996b)

[9] This figure excludes domestic violence.

Average incidence of cheating per year provides a means to compare the reliability of the cannabis market with the criminality of the whole populace. However, a more accurate understanding of the reliability of the market can be obtained by calculating the level of cheating as a percentage of the number of transactions a buyer has completed. The number of years a buyer has been purchasing cannabis does not take into account frequency of purchase. A buyer who is only been purchasing cannabis for a few years could have completed more transactions than a buyer who has been purchasing cannabis for many years by purchasing cannabis more frequently. Again, a high number of incidents of cheating may actually represent a relatively reliable market if the buyer has completed a very high number of transactions. Alternatively, a low number of incidents of cheating may actually represent a very unreliable market if the buyer has only completed a few transactions. Three levels of cheating (per 100 transactions) will be used as benchmarks, less than 0.1 incidents per 100 transactions (<0.1% of transactions result in cheating), less than 1 incident of cheating per 100 transactions (<1%), and greater than 5 incidents of cheating per 100 transactions (>5%). An average level of cheating (per 100 transactions) will be calculated for each type of cheating.

Those buyers who have suffered each type of cheating were asked how they responded to the cheating. All explanations and their frequency will be recorded. Special attention will be paid to the number of buyers who indicated they acted violently, and the number of buyers who did nothing or changed sellers.

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[10] This figure excludes violence which was "homebased" (ie. 24% of assault).

5.14.3 The Explanation for Cheating

(iv) The more exclusive an exchange relationship the lower the level of cheating

(v) The more transactions completed lower the level of cheating

The model suggests two characteristics of exchange can be used to explain levels of cheating, the exclusivity of the exchange relationship, and number of transactions an exchange party has completed. The more exclusive the relationship the greater is the likelihood of future exchange and the greater are the incentives to honour the terms of transactions in the present. The number of transactions an exchange party has completed will influence the level of cheating in two ways. An exchange party will refuse further exchange with cheating exchange partners and continue to transact with reliable exchange partners, so the more transactions completed, on average, the more reliable transactions should become. Experience in the market will also improve an exchange party's ability to detect quality fraud and product fraud.

The average percentage of cheating (per 100 transactions) will be broken down by the exclusivity of exchange relationship, and number of transactions completed. The breakdown of cheating by average incidences (per 100 transactions) is appropriate because levels of cheating come in numerous categories (ie. level of cheating is an ordinal variable) (see Hedderson, 1987). Average cheating should fall as exchange relationships become more exclusive, and as the number of transactions completed increases. An F-test will be performed to determine if a significant relationship exists.

The F-test simultaneously compares all the sample means to determine whether two or more sample means are different from the mean for the whole population (Heiman, 1996). The larger F_{obt} the less likely the differences between the sample means are the

result of sampling error (Heiman, 1996). A significant F_{obt} indicates the sample means are unlikely to represent one population (Heiman, 1996). In other words, the level of the independent variable has a significant effect on the level of the dependant variable (ie. there is a significant relationship). The acceptable probability of sampling error is typically set at 5% of the time (Heiman, 1996).

5.14.4 The Reasons Sellers do not Cheat

(vi) Exchange parties view cannabis transactions as very profitable (Be)

(vii) Reputation will be important to exchange parties (n)

(viii) New exchange partners will be costly to find (n)

(ix) Exchange parties will be concerned about disposing of stocks of cannabis as soon as possible (U)

Initially, sellers were asked to explain in their own words why they do not cheat buyers. All explanations and their frequency were recorded. The aim is to identify reasons for not cheating which are not offered in the subsequent question. Special attention will be paid to the level of support for the reasons used in the model, and the level of support for the traditional reasons.

The model identified four reasons why sellers would not cheat buyers. They are, the benefits of exchange (Be), the legal incentives to dispose of stocks of cannabis as quickly as possible (U), the time it takes to find a new exchange partner (n), and reputation (n). The last two factors relate directly to the search costs in the market. The reasons for reliable transactions developed from the model can be contrasted with the

tradition explanations for reliable illicit drug transactions based on fear of physical retaliation, and fear of arrest by the police. These traditional explanations can be developed into four traditional reasons why sellers do not cheat buyers, "fear of physical retaliation," "fear of attracting the police," "fear of being betrayed to the police," and "cheating may result in committing a more serious crime."

Sellers were asked to score the importance of both the models and the traditional reasons for not cheating customers. A scale of importance will be provided, 1 ("not important") to 7 ("very important"). The average score of importance and standard deviation of each reason will be calculated. The higher the average score of importance the more important the variable. Special attention will be paid to the proportion of sellers who rank the variable as "very important" (ie. a score of 6 or 7). The average score of importance can be used to rank the variables in order of importance. The higher the rank the more important the variable relative to other variables.

5.14.5 The Characteristics of the Retail Cannabis Market

(x) Cannabis transactions will be regular

(xi) Exchange parties will generally return to the same exchange partner

(xii) The financial value of transactions will be small, the maximum value of a retail transaction will be $500

Initially buyers were asked to provide their own reasons why they returned to the same seller, and why they spent the amount they did on cannabis per transaction. The aim is

to identify explanations for these characteristics of the cannabis market not offered in subsequent questions.

The model predicts cannabis transactions will be regular, exchange parties will tend to return to the same seller, and the value of retail transactions will not exceed $500. Exchange parties will return to the same seller to economise on the high search costs in the market (ie. exchange forgone during the search period, the expected legal penalty of search, and the expected losses from victimisation during search). Exchange parties will restrict the value of their transactions to a maximum of $500 to minimise their legal liability under the *Misuse of Drugs Act 1975*.

The models explanation for the characteristics of the retail cannabis market can be contrasted with traditional explanations for these characteristics. The traditional explanation why exchange parties return to the same exchange partner is the seller provided "good quality" product or service. The traditional explanation for the size of purchase is "budget constraint," or "consumption limit."

The variables of the model will be contrasted with traditional explanations for the characteristics of the cannabis market. Buyers will be asked to score the importance of each variable using a scale, 1 ("not important") to 7 ("very important"). The average score of importance and standard deviation of each reason will be calculated. Special attention will be paid to the percentage of sellers who rank the variable as very important (ie. 6 or 7). The average score of importance can be used to rank the variables in order of importance.

5.14.6 Questionnaire Design

The questionnaire had to be easy for respondents to understand and answer. Clarity was particularly important because the questionnaire was to be distributed through the post and so no interviewer would be available to explain instructions and questions. Respondents were likely to be from a broad cross section of society, possessing differing levels of educational achievement, and unlikely to have any formal training in economics. The questionnaire also had to be brief to encourage participation. Again, no interviewer would be present to encourage participation. These constraints had a number of consequences for the information that could be collected with the questionnaire (see Appendix B for copy of entire questionnaire).

Questions had to use simple language and avoid technical economic jargon. This had the biggest impact when it came to search costs and the benefits of exchange. Search costs were difficult to describe. The expected legal penalty during search became, "Reduce the risk of arrest (ie. I am worried about buying from an undercover police officer)." The expected loss from victimisation during search became, "Seller fair/honest (ie. s/he does not rip me off)." The loss of exchange during the period of search became, "Difficult to find an alternative supplier (ie. I do not know any other cannabis sellers)." The benefits of exchange (ie. the consumer/producer surplus) were referred to as the "money I receive from selling cannabis."

Restrictions on the length of the questionnaire meant all the assertions could not be tested with both buyers and sellers. The natural approach seemed to be to ask buyers about incidents of cheating, and ask sellers why they did not cheat. Buyers were more vulnerable to cheating because they were often less experienced than sellers. As profit motivated entrepreneurs sellers appeared to have more tangible reasons to cheat.

5.14.7 Verification of Information

The secrecy surrounding illicit drug markets makes it difficult to verify information provided to researchers. Respondents may understate their involvement if they are not convinced the information they provide will remain confidential. Alternatively, they may exaggerate their involvement if they know the information is completely anonymous (see Michaels, 1987; Zinberg, 1987). There is also the problem of completely fictional participation. People who are attracted to the "glamour" of the illicit drugs trade but are not actually involved, may attempt to complete the questionnaire, providing completely fictional information. The risk of fictional participation is particularly high in the case of a postal questionnaire because there is no personal contact with the respondent.

To minimise the possibility of fictional participation an authenticity check was included in the questionnaire. Respondents were asked to provide prices for two common units of cannabis sale, "bullets" and "ounces." Questionnaires where the prices were missing or beyond the ranges found in the literature, were examined further for evidence of fraud. Questionnaires that were largely incomplete, or completed in a obviously haphazard manner, were removed.

Selective recall and exaggeration are much more difficult to detect. Existing studies of the cannabis market in New Zealand can be used to verify some of the data provided. The national survey of drug use in New Zealand carried out by the Alcohol and Public Health Research Unit in 1990 and again in 1998, is a particularly useful resources for this task (Black and Casswell, 1993; Field and Casswell, 1999a; 1999b). Special attention will be paid to how the levels of cheating reported compare to the number of transactions completed. The number of transactions completed is calculated by combining the question on the frequency of use in a year and the question on the

number of years of purchase. If the reported levels of cheating exceed the calculated number of transactions the questionnaire will be removed.

5.14.8 The Pilot of the Questionnaire

The questionnaire was piloted at a NORML festival during the Auckland Anniversary weekend 1998. Many of those approached were concerned about the legal consequences of completing the questionnaire. Approximately 150 people were approached over an afternoon, 29 eventually agreed to complete the questionnaire (a 19% response rate). Only about ten percent of those approached initially consented to complete the questionnaire. This initial response rate was assisted by a group effect, once one person in a group began the questionnaire others could be convinced to follow suit. People were friendly, but also cautious and sometimes suspicious.

The questionnaire was well received by those who chose to complete it. Subsequent analysis of the data indicated the wording of two questions were modified to improve understanding and answering, but otherwise the questionnaire remained unaltered.

6. A Survey of Cheating in the Cannabis Transactions of ALCP Members

6.1 Introduction

Chapter 5 developed a number of testable assertions about the reliability and characteristics of cannabis transactions in New Zealand. A postal questionnaire was developed to measure the level of cheating in the cannabis market in New Zealand, and to identify the important variables in the decision not to cheat on transactions. The Aotearoa Legalise Cannabis Party (ALCP) was chosen as the sample population. This chapter uses the data collected in the postal questionnaire to test the assertions of the model. The chapter begins by discussing the methodology and response rate of the survey.

6.2 Survey Methodology

6.2.1 Introduction

Drug users and drug dealers are a particularly difficult population to survey. Previous studies of illicit drug markets have identified four central methodological problems: (i) gaining access to a sample, (ii) obtaining the cooperation of subjects, (iii) ensuring the information collected is valid, and (iv) ensuring the safety of researchers and research subjects (Reuter and Haaga, 1989; Reuter *et al.*, 1990).

Researchers have sought to minimise these problems by conducting their research in an appropriate "institutional setting" (Goldstein, 1990; Wiebel, 1990). Institutional settings have included, probation meetings, prisons, and neighbourhood field stations (see Reuter *et al.* 1990; Reuter and Haaga, 1989; Goldstein, 1990). Researchers have

also gained the cooperation of law enforcement agencies, and exploited fortuitous personal contact with drug dealers (see Goldstein *et al.*, 1992; Alder, 1985).

The Aotearoa Legalise Cannabis Party (ALCP) was selected as the institutional setting for this survey of the cannabis market in New Zealand. The ALCP is a political party formed to create legislative pressure to de-criminalize cannabis in New Zealand. The ALCP was chosen because it provided access to a large number of people who were likely to buy and sell cannabis on a regular basis, and it had an organisational structure to promote and distribute a postal questionnaire.

6.2.2 Distribution of the Questionnaire

To ensure the names and addresses of respondents remained confidential the questionnaires were first sent to the ALCP executive who then posted them to individual members (see Appendix C). The questionnaire was included with an ALCP newsletter. A total of 733 questionnaires were sent out on the 8th April 1998. Table 6.1 breaks the ALCP mailout by location.

Table 6.1: ALCP Mailout by Location

Location	Total Sent	Percent
Wellington	172	23.5
Whangarei/Northland	35	4.8
Auckland	8	1.1
South Auckland	20	2.7
Coromandel	150	20.5
Hamilton/Waikato	2	0.3
Taumarunui	2	0.3
Hawkes Bay	31	4.2
Taranaki	3	0.4
Manawatu/Otaki	6	0.8
Wairarapa	6	0.8
Christchurch	255	34.8
Dunedin	25	3.4
Balclutha	12	1.6
Nelson	2	0.3
Timaru	2	0.3
Invercargill	1	0.1
Waiau	1	0.1
Total	733	100

The ALCP mailout provided broad coverage of the whole of New Zealand. Questionnaires were sent to eighteen different locations throughout the North and South Islands, including the four main centres (ie. Auckland, Wellington, Christchurch, Dunedin) and a host of smaller towns. The mailout also reached areas known to be centres of cannabis cultivation, such as the Coromandel (20.5%) and Hawkes Bay (4.2%). The only centre of significance that was not well represented in the mailout was the Auckland area (3.8%).

The National Organisation for the Reform of Marijuana Laws (NORML) had a high profile in the Auckland area. They were subsequently approached to provide additional distribution of the questionnaire in the Auckland area. They agreed to make the questionnaire available at their Queens Street retail store in central Auckland. Forty questionnaires were left at the NORML store.

Following the mailout the project was approached by the ALCP's representative for the central North Island, Alan Webb. He offered to personally distribute additional questionnaires in the Hawkes Bay where he lived (see Appendix D). As a seasoned political activist for cannabis reform he indicated he had many personal contacts in the local cannabis market. He was willing to canvas the local city centres and bars in the Hawkes Bay area (see Appendix D). Five hundred and forty questionnaires were sent to him between the 17th April and 13th May 1998.

6.3 Response Rate

6.3.1 Introduction

The questionnaire was distributed in three ways, via a ALCP mailout, through the canvassing of Alan Webb, and from the NORML shop in Auckland. The response rate for the entire survey was 30%. A total of 357 questionnaires were returned completed. Although the overall response rate is relatively low, it is acceptable given the sensitivity of the information collected, and the mode of distribution (ie. a postal questionnaire).

6.3.2 The Response Rate of the ALCP Mailout

The response rate for the ALCP mailout was 17%. Table 6.2 presents the details of the returns from the ALCP mailout.

Table 6.2: Response Rate of ALCP Mailout by Location

Location	Sent	Returns	Received	Completed	Response (%)
Wellington	172	40	132	30	23
Whangarei/Northland	35		35	11	31
Auckland	8	1	7	6	86
South Auckland	20		20		0
Coromandel	150	53	97	11	11
Hamilton/Waikato	2		2	2	100
Taumarunui	2		2		0
Hawkes Bay	31	1	30	1	3
Taranaki	3	2	1	1	100
Manawatu/Otaki	6		6	6	100
Wairarapa	6	2	4	1	25
Christchurch	255	28	227	22	10
Dunedin	25	2	23	5	22
Balclutha	12	2	10	1	10
Nelson	2	1	1	1	100
Timaru	2	1	1	1	100
Invercargill	1		1		0
Waiau	1	1	0		
no postal mark				2	
Total	733	134	599	101	17

One hundred and one questionnaires were returned completed from the ALCP mailout. One hundred and thirty-four questionnaires were returned "return to sender." The response rate varied significantly between locations. Many of the smaller rural locations had a 100% response rate, while Auckland (86%), Northland (31%), Wairarapa (25%), Wellington (23%), and Dunedin (22%) had above average response rates. In contrast, the Coromandel (11%), Christchurch (10%), Balclutha (10%), and the Hawkes Bay (3%) had particularly low response rates. No returns at all were received from South Auckland, Taumarunui, and Invercargill. The wide variation in the response rate at different locations suggests a problem with the distribution of the questionnaire rather than with its design.

The ALCP had attempted to up-date their membership database before distributing the questionnaire but conceded many of the addresses may still be out-of-date. Elections were the ALCP's primary motivation to up-date its membership database and there had not been a general election since 1996. The high number of "return to senders" (18%) suggests many of the ALCP addresses were not current. It seems likely that many more questionnaires than the ones actually returned through the mail were sent to an old address and were merely thrown out rather than returned through the mail.

6.3.3 The Response Rate of Alan Webb's Canvassing

The response rate from Alan Webb's canvassing was 45%. Two hundred and forty-six of the 540 questionnaires sent to Alan Webb were returned completed. This is comparable with the response rate achieved by Reuter and Haaga (1989) when interviewing incarcerated drug dealers (42%). The high response rate from the Alan Webb canvassing demonstrates the value of personal contacts and local knowledge in illicit market surveying.

6.3.4 The Response Rate from the NORML Shop

The response rate from the questionnaires left at the NORML shop was 25%. Ten of the forty questionnaires were returned completed. The low response rate at the NORML shop reflected the relatively passive nature of distribution (ie. placed on the counter for customers to take if they wish).

6.4 Removed Questionnaires

A total of 16 questionnaires were removed during the assessment phase leaving 341 verfied questionaires. Four questionnaires were removed because the prices provided for common units of cannabis sale were well outside the price ranges reported in the recent literature (see section 5.14.7). Two questionnaires were removed because the

reported incidents of cheating exceeded total number of transactions. Nine questionnaires were removed because they were largely incomplete. One questionnaire was removed because it was filled out erratically.

6.5 Eligibility

To be eligible to complete the questionnaire a person had to have bought or sold cannabis in New Zealand in the last five years. Thrity-nine of the 341 verified questionnaires were not eligible. Respondents were ineligible for two reasons, they either did not use cannabis at all (3.8%), or they did use cannabis but did not buy or sell it (7.6%). Three hundred and two people were eligible to complete the questionnaire (88.6%). Table 6.3 breaks down the eligible questionnaires by location.

Table 6.3: Eligible Questionnaires by Location

Location	Completed	Percent
Auckland (NORML)	8	2.6
Hastings/ Hawkes Bay	205	67.9
Wellington	30	9.9
Whangarei/Northland	5	1.7
Auckland	5	1.7
Coromandel	2	0.7
Hamilton/Waikato	7	2.3
Hawkes Bay	1	0.3
Taranaki	1	0.3
Manawatu/Otaki	2	0.7
Wairarapa	4	1.3
Christchurch	22	7.3
Dunedin	5	1.7
Balclutha	1	0.3
Nelson	1	0.3
Timaru	1	0.3
no postal mark	2	0.7
Total	302	100

As expected the ALCP membership provided good access to people who bought and sold cannabis. The success of Alan Webb's canvassing meant a high number of completed questionnaires were from the Hawkes Bay region (67.9%). Initially, the questionnaires that were part of the ALCP mailout were analysed separately from the questionnaires distributed by Alan Webb, but the responses from the two groups were so similar it was decided to combine them into one sample.[1] The literature reported no

[1] The average scores of the responses from the Hawkes Bay questionnaires were easily within one standard deviation of the average scores of the responses from the ALCP questionnaires. On average, the ALCP mailout sample had been buying cannabis for longer, bought it less often, and spent more per transaction. Similar scores were recorded for the question about the exclusivity of exchange relationships, with the mailout recording an average of 3.415 (std dev. .809) for the question, and the Hawkes Bay recording an average of 3.229 (std dev. 1.03) for the same question.

significance difference in the characteristics of the cannabis market between regions within New Zealand, apart from possibly differences in price between rural and urban areas, and the existence of retail outlets for cannabis in Auckland ("tinny houses"). Tinny houses only serviced a small proportion of the market in Auckland, focusing on adolescents of school age who were unable to purchase cannabis through social networking. Statistical tests could be carried out on the total sample to verify any relationship between urban versus rural location and the price of cannabis.

The level of gift giving in the ALCP sample (ie. 7% "use cannabis, but did not buy or sell"[2]) was not as high as reported in other surveys. The survey of cannabis users conducted in the Te Runanga Cannabis Project Report (1995) found two-thirds of users received their cannabis for free from a friend. The Field and Casswell (1999a) survey reported 42% of current cannabis users received all their cannabis for free, with 65% receiving most of their cannabis in this way. The Black and Casswell (1993) survey reported a very similar picture of acquisition (Black and Casswell, 1993; Field and Casswell, 1999b). The difference in the level of gift giving may reflect differences in sample characteristics (ie. ALCP members may be more serious cannabis users), and/ or different levels of confidence in the confidentiality of information supplied (ie. the telephone surveys of Black and Casswell (1993) and Field and Casswell (1999a) and personal interviews of Te Runanga (1995), versus the anonymous postal questionnaire used for this survey).

6.6 Generalizability

The use of "institutional settings" in studies of illicit drug markets limits the generalizability of results (Reuter *et al.*, 1990; Reuter and Haaga, 1989; Goldstein *et*

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[2] This figure will include those who obtain their cannabis by growing their own, as well as those who receive it as a gift. The actual level of gift giving is therefore likely to be lower than 7%.

al., 1992). "Institutional settings" can only capture a select part of the entire market population. This type of sample selectivity is held to be acceptable in illicit drug research because of the difficulties with gaining access to a sample, and the general ignorance of how illicit drug markets function (Reuter *et al.*, 1990; Reuter and Haaga, 1989). Sample selectivity means the researcher must be cautious when relating their results to the illicit drug market as a whole, or to illicit markets in general (Reuter *et al.*, 1990; Reuter and Haaga, 1989; Goldstein *et al.* 1992).

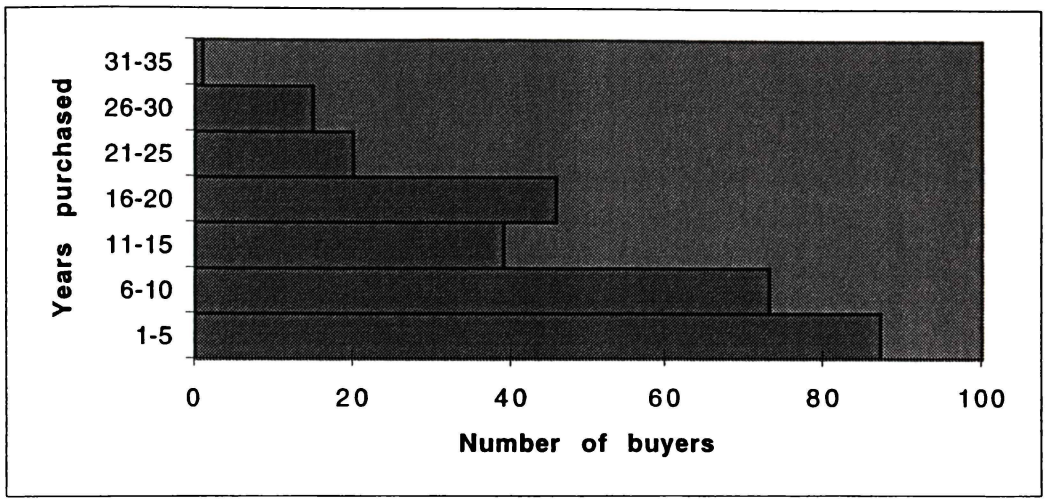
The ALCP survey provides a detailed picture of the cannabis transactions of a large number of regular cannabis buyers and sellers throughout New Zealand. The information collected can be used to make cautious observations about the cannabis market in New Zealand as a whole. The survey is the first ever systematic survey of the reliability of cannabis transactions in New Zealand. The original output for the entire questionnaire is reproduced in Appendix E.

6.7 The Characteristics of the ALCP Sample

Nearly half of the ALCP sample (45.8%) had both "bought and sold" cannabis. Fifty percent "only bought" cannabis, while 4.2% "only sold" cannabis. The large number of people who "bought and sold" cannabis is consistent with existing information on the structure of illicit drug markets. Illicit drug markets have very personalised exchange relationships which result in a very large distribution sector (see Rottenberg, 1968; Rubin, 1973; Brecher, 1972).

Buyers were generally very experienced in the market. Figure 6.1 presents the number of years buyers had been purchasing cannabis.

Figure 6.1: Years Cannabis Purchased



Just over two-thirds of buyers (69.0%) had been buying cannabis for more than 5 years, nearly half of buyers (43.1%) had been buying for more than 10 years. Thirteen percent of the buyers (12.8%) had been buying for more than 20 years. Only 1.4% of buyers had been buying cannabis for less than 2 years. The average number of years of cannabis purchase was 11.4 years, with a standard deviation of 7.8 years.

The confidentiality standards requested by the ALCP executive meant it was not possible to ask respondents their age. An approximate age profile of buyers can be calculated by taking the number of years each had been buying cannabis, and adding the age they were mostly likely to have begun purchasing. The national surveys of drug use in New Zealand indicated 15 years old was the earliest age when significant numbers of people reported first trying cannabis (Black and Casswell, 1993; Field and Casswell, 1999a; 1999b). If 15 years old is used as the age of first purchase, the age of buyers ranges from 16-50 years old. The average age of respondents would be 26.4 years old.

The constructed age profile of ALCP cannabis buyers can be compared with the age profile of current cannabis users from the Black and Casswell (1993) national survey.[3] Table 6.4 presents the comparison of the age profile of the ALCP sample with the age profile of the Black and Casswell Survey (1993).

Table 6.4: Comparison of Age Profile of ALCP Buyer Sample with Black & Casswell (1993) National Sample (%)

Age	Black and Casswell	ALCP Sample	Difference
15-17	11.2	7.8	3.4
18-19	13.3	13.9	-0.6
20-24	26.6	24.2	2.4
25-29	20.5	20.7	-0.2
30-34	15.0	12.2	2.8
35-39	9.0	12.4	-3.4
40-45	5.0	8.5	-3.5
>45	0.0	0.4	-0.4
Total	100.0	100.0	0.5

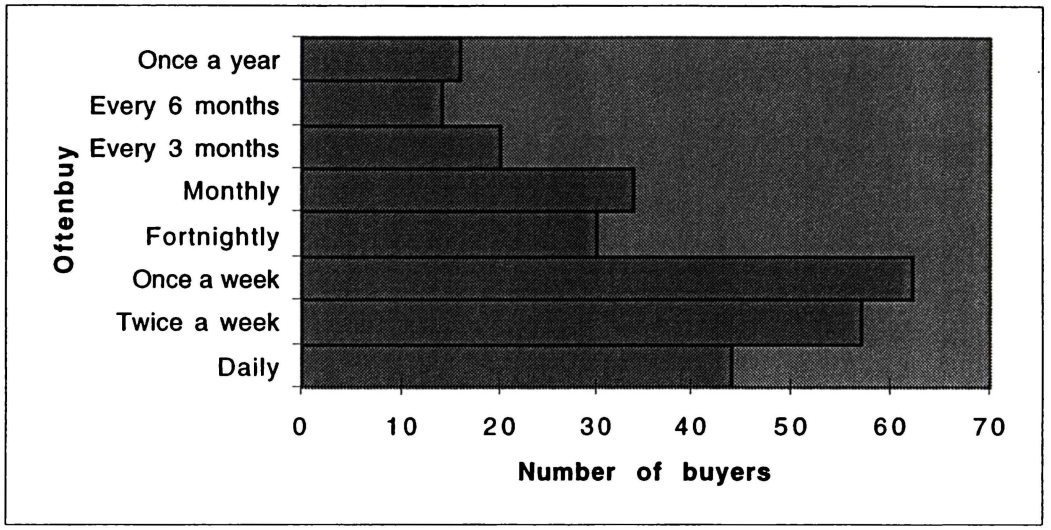
Overall the ALCP sample is slightly older than the Black and Casswell (1990) sample (33.5%, 30 years or over compared to 29%, 30 years or over). This is consistent with the likely characteristics of the ALCP organisation, and the canvassing methods used by Alan Webb. Political organisations like the ALCP are likely to attract older people. The vast majority of ALCP members would at least be of voting age (ie. 18 years old). The canvassing of bars and the polytech by Alan Webb is likely to target

[3] The age profile of the Black and Casswell (1993) data was obtained through personal correspondence with the Alcohol and Public Health Research Unit.

older adolescents. Overall the age structures of the two samples are fairly close (difference between age cohorts ranges 0.2-3.5%, net difference + 0.5%). This increases our confidence in the representativeness of the ALCP sample.

Many buyers purchased cannabis on a frequent basis. Figure 6.2 presents the frequency of cannabis purchase over one year.

Figure 6.2: How Often Cannabis is Purchased



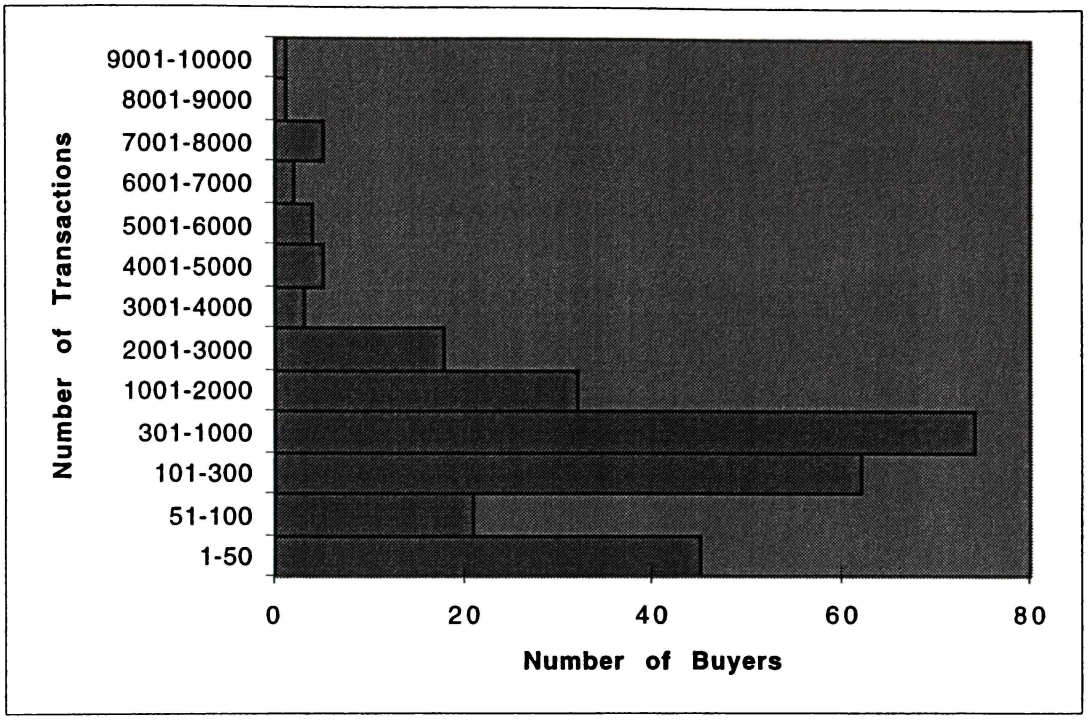
Over half of the buyers (58.8%) purchased cannabis once a week or more often. Sixteen percent of buyers purchased it on a daily basis. Eighty-two percent of buyers (81.9%) purchased cannabis once a month or more often.

The frequency of purchase of the ALCP sample appears high when compared to the Black and Casswell (1993) and Field and Casswell (1999a) surveys. These surveys did not ask how often people purchased cannabis, but did ask how often they used cannabis. People will generally use more frequently than they buy. The frequency of

cannabis use in the national surveys did not change markedly from 1990 to 1998 (Field and Casswell, 1999b). The most popular use categories were "1-2 times" in the last 12 months, and "1-2 times" in the last 30 days (Black and Casswell, 1993). These answers correspond to "Once a year"/"Every 6 months," and "Monthly"/"Fortnightly," categories on the ALCP questionnaire scale. The discrepancy between the national surveys and the ALCP sample could be due to differences in sample characteristics (ie. ALCP members may be more serious cannabis users), and/or different levels of confidence in the confidentiality of information supplied (ie. telephone surveys, versus an anonymous postal questionnaire).

The frequency of purchase and number of years of purchase can be combined to calculate the number of cannabis transactions each buyer has completed. Figure 6.3 presents the number of transactions completed by buyers in the ALCP sample. This calculation confirms the experience of the ALCP sample.

Figure 6.3: Number of Transactions Completed

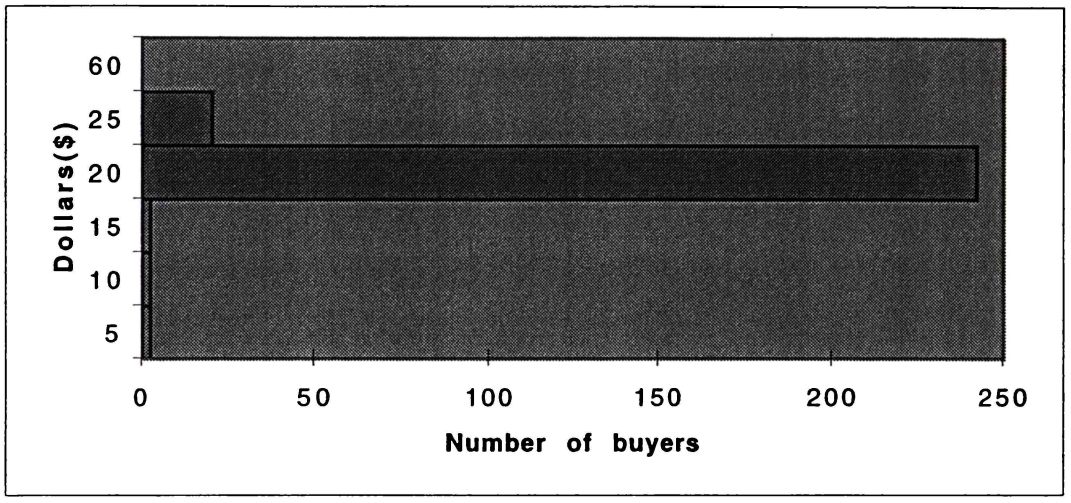


The number of transactions completed ranged from 4 to 9125. About three quarters of buyers (76.6%) had completed over 100 transactions, just over half (53.1%) had completed over 300 transactions, and a quarter (26%) had completed over 1000 transactions. Eight percent of buyers (7.7%) had completed over 3000 transactions. Only 6% of buyers (5.9%) had completed less than 20 transactions. The average number of transactions completed was 952.8, with a standard deviation of 1602.8.

6.8 Prices in the Cannabis Market

All respondents were asked to indicate the price they normally paid for two common units of cannabis sale, 'bullets' and 'ounces.' Figure 6.4 presents the prices paid for a bullet of cannabis.

Figure 6.4: Price of a Bullet of Cannabis



The price for a 'bullet' of cannabis ranged from $5 to $60. The overwhelmingly majority of respondents (90%) paid $20, with a small minority paying $25 (7.4%). The average price for a 'bullet' was $20.30, with a standard deviation of $3.22 .

Only six people (2.2%) paid below $20 for a 'bullet' of cannabis. These low prices may reflect a close personal connection with the seller (eg. sale by friend or family relation). One person (0.4%) reported paying $60 for a bullet. This price must be viewed as an exception.

The price for a bullet of cannabis is not widely quoted in the academic literature. Newspaper and magazine articles often quote a price of $20. This information is generally obtained by consulting one or two 'informed' sources. The 1990 survey of drug use in New Zealand reported the average price for a 'bullet' of cannabis to be $40, ranging from $37-$43 (Black and Casswell, 1993). The 1998 survey found the average price of a 'bullet' of cannabis was $24 (Field and Casswell, 1999a). Field and Casswell (1999b) concluded the price of cannabis must have fallen between 1990 and 1998. The data from the ALCP survey strongly supports the $20-25 price for a bullet.

The literature indicates location of purchase will influence the price of cannabis. Buyers in urban locations will pay higher prices for cannabis than buyers in rural areas who are closer to source of production. To test the influence of location on price of cannabis the ALCP sample was divided into a urban and rural sample ("Urban" = Auckland (NORML), Auckland, South Auckland, Wellington, Hamilton, Christchurch, and Dunedin. "Rural" = Hastings, Whangarei/Northland, Coromandel, Taumarunui, Hawkes Bay, Taranaki, Manawatu, Wairarapa, Balcutha, Nelson, Timaru, Invercargill). Table 6.5 presents the average bullet price for the Urban and Rural categories.

Table 6.5: Average Price for a Bullet of Cannabis for Urban and Rural Locations

Variable	Mean	Std. Dev.	Cases
Entire Population	20.30	3.23	267
Urban	21.25	2.18	64
Rural	20.00	3.45	203

(F_{obt} = 7.45, p = .0067)

There is a statistically significant relationship between urban and rural location and bullet prices.

Respondents were also asked how much they normally paid for an 'ounce' of cannabis. A number of people (63) answered the question with a price range rather than a single amount. Figure 6.5 presents the low value of the price range. Figure 6.6 presents the high value of the price range.

Figure 6.5: Price for an Ounce of Cannabis (Low Prices)

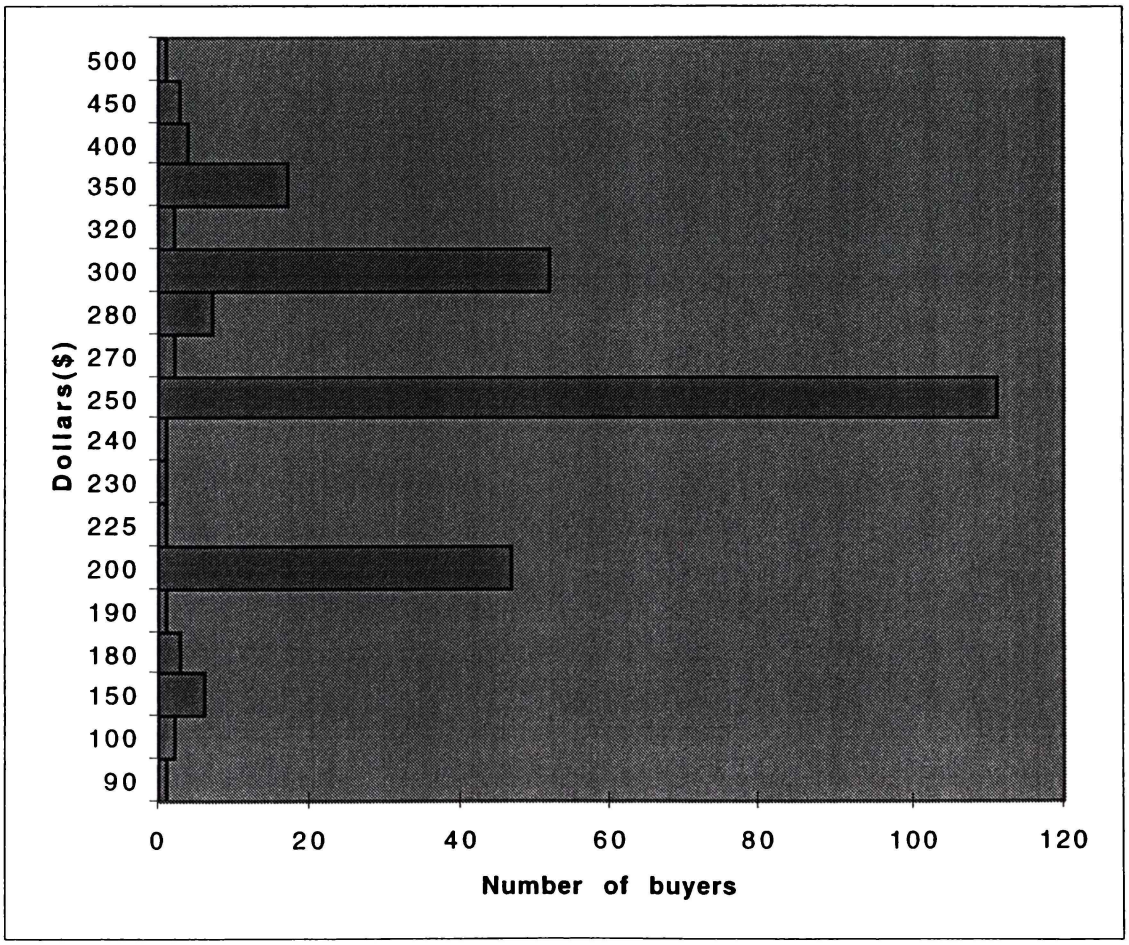
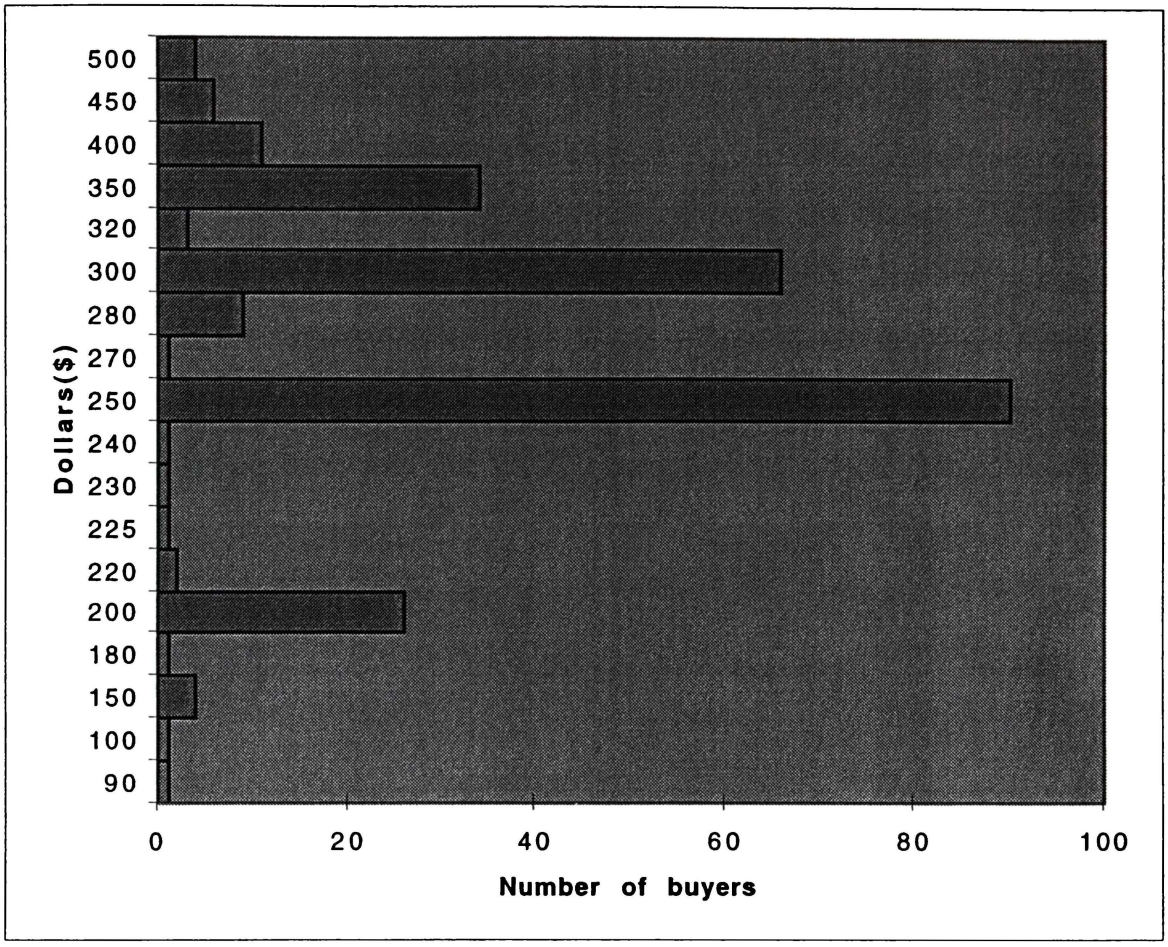


Figure 6.6: Price for an Ounce of Cannabis (High Prices)



The price for an 'ounce' of cannabis ranged from $90 to $500 for both sets of data. Popular prices for an ounce began at $200, and increased in $50 intervals up to $350. In the low price range, 86.6% of people paid either $200, $250, $300, or $350 exactly. In the high price range, 82.5% of people paid either $200, $250, $300, or $350 exactly.

The most popular price for an ounce in the low price range was $250 (42.4%), followed by $300 (19.8%), and $200 (17.9%). The most popular price for an ounce in the high price range was $250 (34.4%), followed by $300 (25.2%), and $350 (13.0%). The average price for an ounce in the low range was $259.18, with a standard deviation of $56.56. The average price for an ounce in the high range was $283.80, with a standard deviation of $65.72.

The price of an 'ounce' of cannabis is reported to vary considerably according to the quality of material, the location of the buyer, the time of season, and the success of police eradication programs (Te Runanga, 1995). The Te Runanga O Te Rarawa Cannabis Project Report (1995) reported the price of an ounce of cannabis in New Zealand ranged from $200-500. The 1990 survey of drug use in New Zealand reported the average price of an 'ounce' of cannabis to be $222, ranging between $212 - 232. The 1998 survey reported the average price of a "bag" of cannabis was $118.[4] Field and Casswell (1999b) suggest the lower price in 1998 indicates a fall in the price of cannabis.

The data collected in the ALCP survey is consistent with the $200-500 price range reported in the literature. Ninety-five percent of the low price range, and 97.3% of the high price range, fall within the $200-500 price range. The ALCP survey provides additional information on the characteristics of ounce prices. Prices generally begin at $200 and increase in $50 steps up to $350. The most common prices are $250 and $300. The ALCP data does not support the price fall ($118) indicated by the 1998 national survey of drug use. Only 5% of the low price range, and 2.7% of the high

[4] The use of the word "bag" instead of "ounce" in the 1998 survey would seem to make comparisons with the 1990 survey difficult. Cannabis is also often sold in $50 bags which are not ounce size. Field and Casswell (1999b) do not appear to make a clear distinction. They consider the lower price in 1998 to reflect a fall in the price of cannabis. The issue is made even less clear by the different samples used to calculate the price for a bag of cannabis as reported in the original report ($122), and later in the report comparing the 1998 results with the 1990 results ($118).

price range, in the ALCP sample were below $200. The price collected in the 1998 survey for a "bag" of cannabis may not refer to an 'ounce' of cannabis.

The literature indicates location of purchase will also influence the price of cannabis. Buyers in urban locations will pay higher prices than buyers in rural areas. Table 6.6 and Table 6.7 present the average price of an ounce of cannabis for the urban and rural categories defined in the previous question.

Table 6.6: Average Price for an Ounce of Cannabis for Urban and Rural Locations (Low Prices)

Variable	Mean	Std. Dev.	Cases
Entire Population	259.06	56.72	260
Urban	273.86	57.92	70
Rural	253.61	55.43	190

(F_{obt} = 6.65, p = .0104)

Table 6.7: Average Price for an Ounce of Cannabis for Urban and Rural Locations (High Prices)

Variable	Mean	Std. Dev.	Cases
Entire Population	283.87	65.93	260
Urban	303.43	63.29	70
Rural	276.66	65.58	190

(F_{obt} = 8.70, p = .0035)

There is a statistically significant relationship between urban and rural location and the price for an ounce of cannabis.

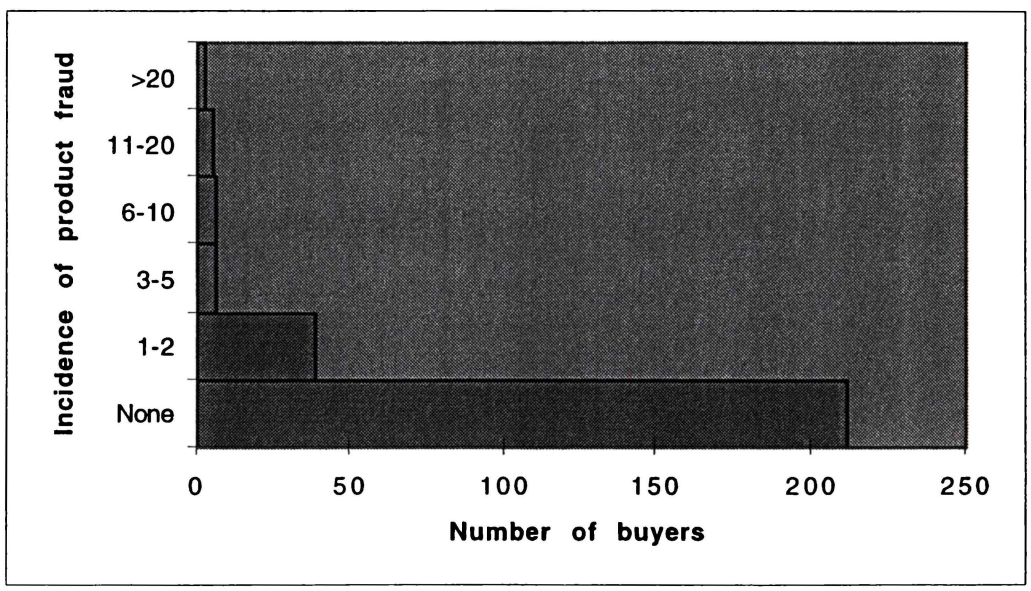
6.9 The Reliability of Cannabis Transactions

The first group of assertions concerned the reliability of cannabis transactions. The model predicted, product fraud, robbery, and assault, would be generally rare, whereas quality fraud would be relatively common. Buyers were predicted to respond to cheating by either changing sellers or by doing nothing, rather than with violent retaliation.

6.9.1 Incidence of Product Fraud

Buyers were asked how many times they had received a fraudulent substance from a cannabis transaction. The results are presented in Figure 6.7.

Figure 6.7: Incidence of Product Fraud

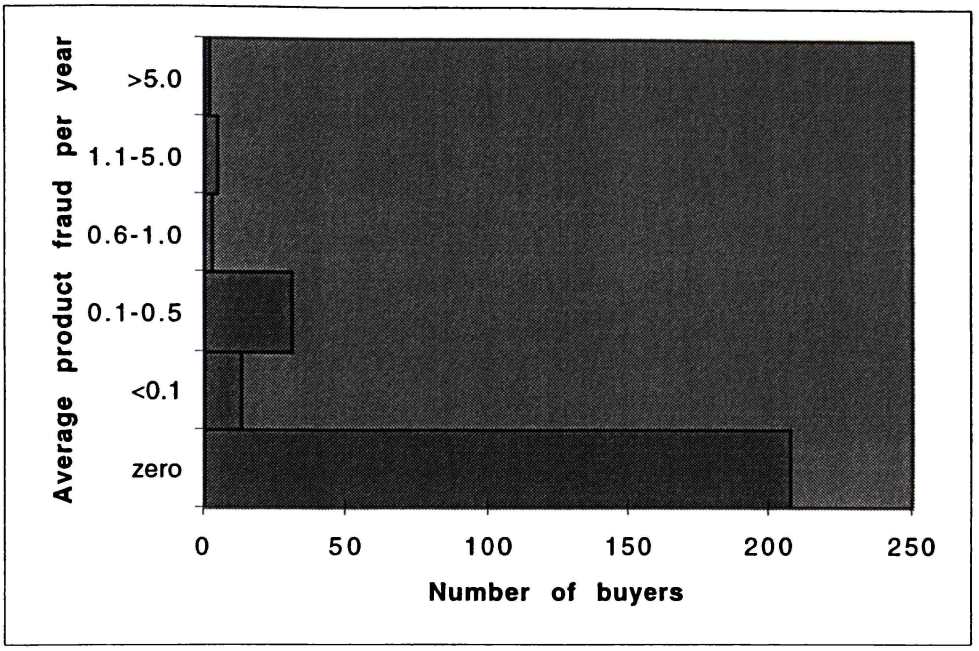


Reports of product fraud ranged from none to 94 times. Over three-quarters of buyers (78.5%) had never suffered from product fraud. Ninety-three percent of buyers (92.6%) had suffered less than three incidents of product fraud. Three buyers (1.2%) reported more than 20 incidents of product fraud, one reported 30 incidents, one 52 incidents, and the other reported 94 incidents.[5]

The total incidents of product fraud can be converted into an average incidence of product fraud per year per buyer by dividing the total incidents of product fraud by the number of years a buyer had been purchasing cannabis. The results are presented in Figure 6.8.

[5] These unusually high reports of product fraud must be treated with caution. It is possibly these people were not able to distinguish product fraud from the much more common quality fraud. Two of these answers were original percentage answers. They were calculated into an actual figure only after the number of transactions were calculated. Since the respondent did not know what this final figure was, it is difficult to know if they would have still considered it appropriate. When the total number of transactions is large, seemingly small percentages can actually represent very high incidents of cheating.

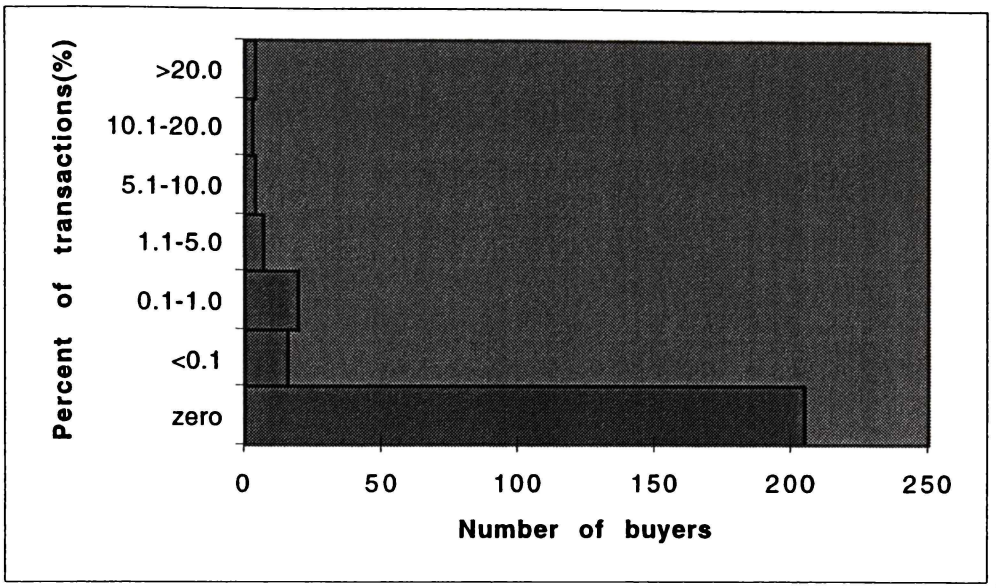
Figure 6.8: Average Incidence of Product Fraud per Year



The average level of product fraud per year ranged from zero to 26 times per year. Over three-quarters of buyers (79.4%) had never suffered from product fraud. Eighty-four percent of buyers (84.3%) suffered product fraud less than 0.1 times per year on average (less than one incident per 10 years). Only 3% of buyers suffered from product fraud greater than 1 time per year on average. Two buyers reported more than 5 incidents of product fraud per year, one reported 7.5 incidents per year, the other 26 incidents per year. The last figure must be viewed as particularly suspect. The average incidence of product fraud per year for all buyers was 0.232 times (approximately one incident every 5 years), with a standard deviation of 1.68. This is equivalent to 23.2 incidents of product fraud per 100 people per year.

Figure 6.9 presents the incidence of product fraud as a percentage of transactions.

Figure 6.9: Product Fraud as a Percentage of Transactions



Eighty-five percent of buyers (85.3%) had experienced product fraud at a rate of less than .1% of transactions (less than 1 transaction in 1000 results in product fraud). Ninety-three percent of buyers (93.1%) experienced product fraud less than 1% of the time (less than 1 incident of product fraud per 100 transactions). Only 2.3% of buyers suffered from product fraud more than 10% of the time. The average incidence of product fraud was 1.0%, with a standard deviation of 5.8%.

Table 6.8 breakdowns the average incidence of product fraud by the self reported level of exclusivity. To generate a reasonable number of cases for each level of exclusivity a number of categories had to be combined (10 = "I buy from different sellers, rarely returning to the same one more than once" and "I buy from different sellers, occasionally I return to the same ones" and "Many of my purchases are from the same seller, but I also buy from several other sellers," 20 = "I nearly always return to the same seller, I only occasionally buy from any other sellers," 30 = "I always buy from the same seller").

Table 6.8: The Average Incidence of Product Fraud by Level of Exclusivity

Variable	Mean	Std. Dev.	Cases
Entire population	0.8	5.3	245
Waybuy 10	0.8	5.3	141
Waybuy 20	1.2	6.0	78
Waybuy 30	0.2	0.9	26

(F_{obt} = .35, p = .6991)

Table 6.9 breakdowns the average incidence of product fraud by number of transactions completed. Transactions have been re-coded into three categories (1 = 0-99 transactions, 2 = 100-349 transactions, 3 = 350-10000 transactions).

Table 6.9: The Average Incidence of Product Fraud by Transactions Completed

Variable	Mean	Std. Dev.	Cases
Entire population	1.0	5.8	259
Trans 1	2.4	8.9	63
Trans 2	1.5	7.0	72
Trans 3	0.07	0.3	124

(F_{obt} = 3.79, p = .0237)

Those who had suffered from product fraud were asked to explain what they did about it. The responses are presented in Table 6.10.

Table 6.10: Victims Responses to Product Fraud

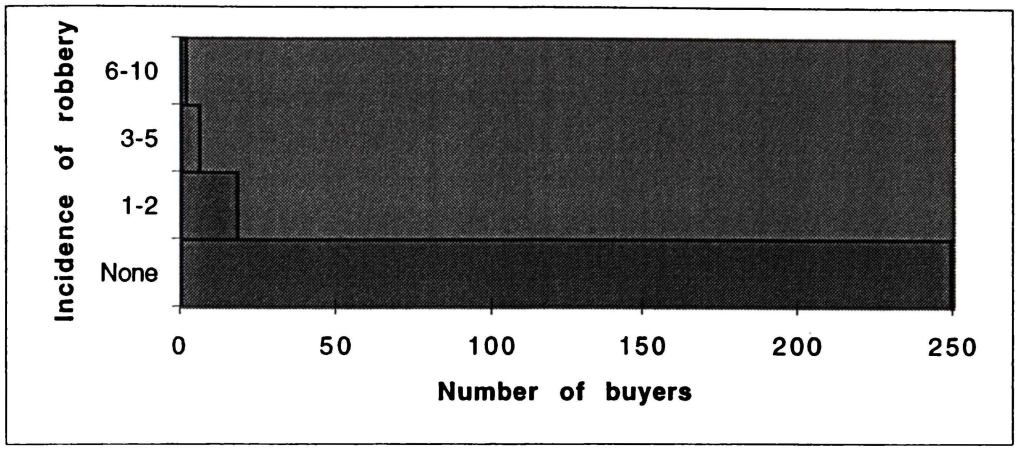
Response	Number	Percent
nothing	16	28
changed supplier/went elsewhere	13	22
complained	9	16
got replacement/asked for money back	8	14
attacked dealer	4	7
spread word to other buyers	3	5
inspected goods first	2	3
refused to pay/didn't buy it	2	3
told police about business practices	1	2
Total	58	100

Forty-four percent of the victims of product fraud responded by either doing nothing (28%) or complaining (16%). Twenty-two percent of victims responded by changing their supplier. Only 7% of victims responded by attacking their dealer.

6.9.2 Incidence of Robbery

Buyers were asked how many times they had been robbed while purchasing cannabis. The results are presented in figure 6.10.

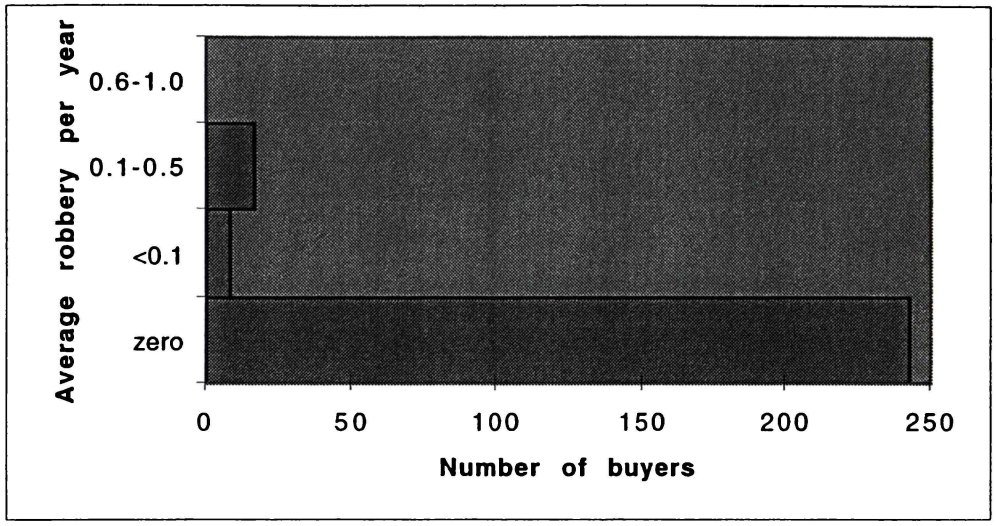
Figure 6.10: Incidence of Robbery



Incidents of robbery ranged from none to 10 times. Ninety-one percent of buyers (90.5%) had never been robbed. Only 26 buyers (9.5%) had ever been robbed. Fifteen of these (5.5%) were robbed only once. Ten buyers (3.6%) were robbed between 2-6 times. One person (0.4%) was robbed 10 times.

Figure 6.11 presents the average incidence of robbery per year per buyer.

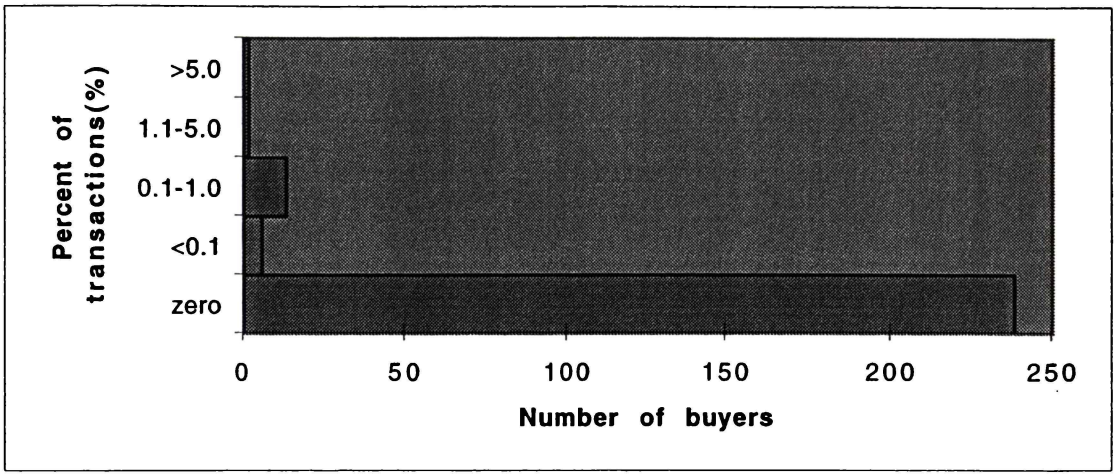
Figure 6.11: Average Incidence of Robbery per Year



The average incidence of robbery per year ranged from zero to 0.5 times per year. Ninety-one percent of buyers (90.5%) had never been robbed. Three percent of buyers were robbed less than 0.1 times per year (less than 1 time in 10 years). Six percent of buyers (6.3%) were robbed between 0.1-0.5 times per year. No buyers were robbed more than 0.5 times per year. The average incidence of robbery per year for all the buyers was 0.019 times per year, with a standard deviation of 0.07. This is equivalent to 1.9 robberies per 100 people per year.

Figure 6.12 presents the incidence of robbery as a percentage of transactions.

Figure 6.12 Robbery as a Percentage of Transactions



Six of the robbery victims were robbed less than .1% of the time (less than 1 robbery per 1000 transactions). Thirteen were robbed between 0.1-1.0% of the time. Only four buyers (1.6%) experienced levels of robbery higher than 1% of transactions, one at a rate of 3%, another at a rate of 5%, one at 12.5%, and another at 16.66%. The average incidence of robbery was .16%, with a standard deviation of 1.3%.

Table 6.11 breakdowns the average incidence of robbery by the self reported level of exclusivity.

Table 6.11: The Average Incidence of Robbery by Level of Exclusivity

Variable	Mean	Std. Dev.	Cases
Entire population	0.17	1.4	255
Waybuy 10	0.17	1.4	147
Waybuy 20	0.07	0.34	78
Waybuy 30	0.4	2.3	30

(F_{obt} = .83, p = .4357)

Table 6.12 breakdowns the average incidence of robbery by number of transactions completed.

Table 6.12: The Average Incidence of Robbery by Transactions Completed

Variable	Mean	Std. Dev.	Cases
Entire population	.17	1.3	261
Trans 1	0.6	2.7	62
Trans 2	.04	1.7	74
Trans 3	.02	0.1	125

(F_{obt} = 4.35, p = .0138)

Those buyers who were robbed were asked to explain what they did about it. The responses are presented in Table 6.13.

Table 6.13: Victims Responses to Robbery

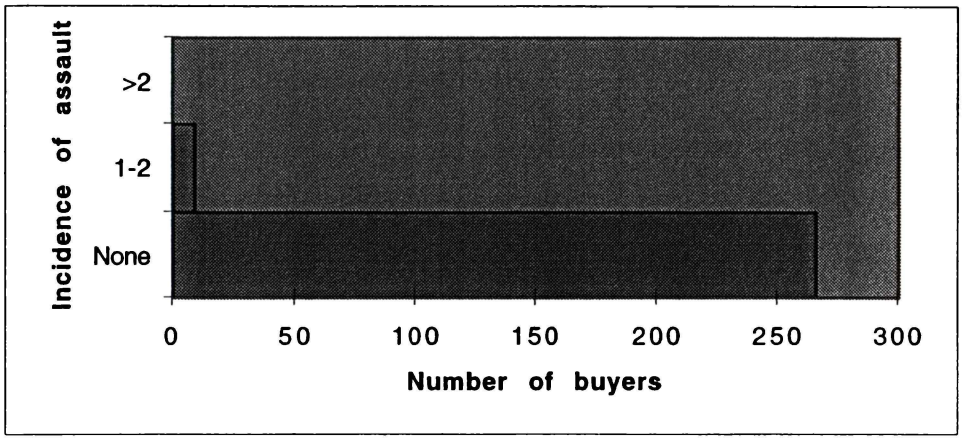
Response	Number	Percent
nothing	10	39
changed supplier/went elsewhere	7	27
attacked dealer	4	15
spread word to other buyers	2	7
complained	1	4
reported it to the police	1	4
took possessions as compensation	1	4
Total	26	100

Forty three percent of the robbery victims responded by either doing nothing (39%) or complaining (4%). Twenty-seven percent of victims changed suppliers. Fifteen percent of victims responded by attacking their dealer. Seven percent of victims warned other buyers about the seller.

6.9.3 Incidence of Assault

Buyers were asked how many times they had been assaulted while carrying out cannabis transactions. The results are presented in figure 6.13

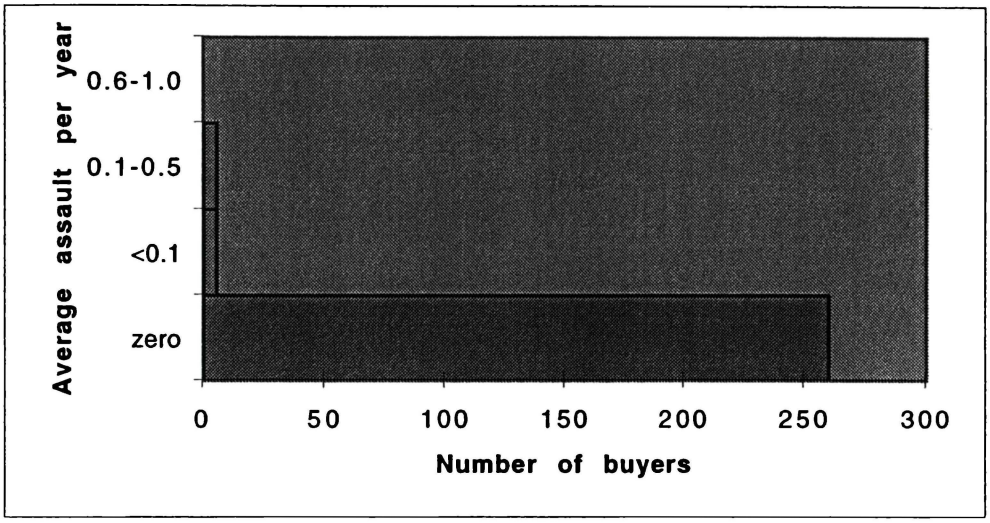
Figure 6.13: Incidence of Assault



Incidents of assault ranged from none to 9 times. Ninety-six percent of buyers (96.4%) had never been assaulted. Only ten buyers (3.6%) had ever been assaulted. Seven of these (2.5%) were assaulted only once. Two buyers were assaulted twice, and one buyer was assaulted 9 times.

Figure 6.14 presents the average incidence of assault per year per buyer.

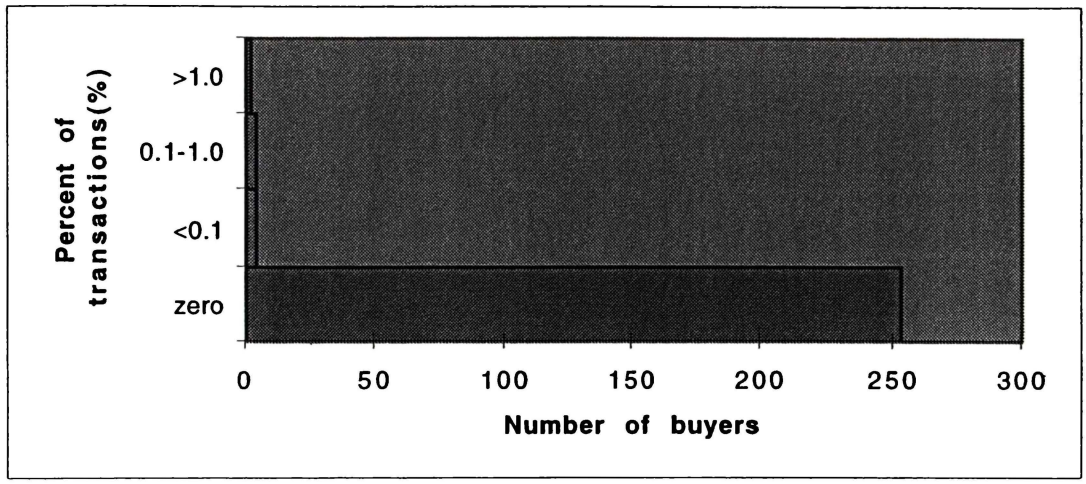
Figure 6.14: Average Incidence of Assault per Year



The average incidence of assault per year ranged from zero to 0.38 times (approximately 1 assault in three years maximum). Ninety-six percent of buyers (96.3%) had never been assaulted. Only ten buyers (3.8%) had ever been assaulted. Five buyers (1.9%) were assaulted less than 0.1 times per year (less than 1 time per 10 years). The remaining 5 buyers were assaulted between 0.1-0.38 times per year. No buyers were assaulted more than 0.5 times per year on average. The average incidence of assault per year for all the buyers was 0.005 times per year, with a standard deviation of 0.032. This is equivalent to 0.5 assaults per 100 people per year.

Figure 6.15 presents the incidence of assault as a percentage of transactions.

Figure 6.15: Assault as a Percentage of Transactions



Four of the assault victims were assaulted less than .1% of the time (less than 1 time in 1000 transactions). Another four buyers were assaulted between 0.1-1% of the time (less than 1 time in 100 transactions). Only two buyers (0.8%) were assaulted more than 1% of the time, one at 1.4% and another at 1.7%. The average incidence of assault was .02%, with a standard deviation of 1.4%.

Table 6.14 breakdowns the average incidence of assault by the self reported level of exclusivity.

Table 6.14: The Average Incidence of Assault by Level of Exclusivity

Variable	Mean	Std. Dev.	Cases
Entire population	0.02	.14	257
Waybuy 10	0.01	.05	148
Waybuy 20	0.04	.25	79
Waybuy 30	0.002	.01	30

(F_{obt} = 2.29, p = .1026)

Table 6.15 breakdowns the average incidence of robbery by number of transactions completed.

Table 6.15: The Average Incidence of Assault by Transactions Completed

Variable	Mean	Std. Dev.	Cases
Entire population	.02	.14	263
Trans 1	.02	.18	63
Trans 2	.04	0.2	74
Trans 3	.003	.02	126

(F_{obt} = 1.38, p = .2541)

Those buyers who were assaulted were asked to explain what they did about it. The responses are presented in Table 6.16.

Table 6.16: Victims Responses to Assault

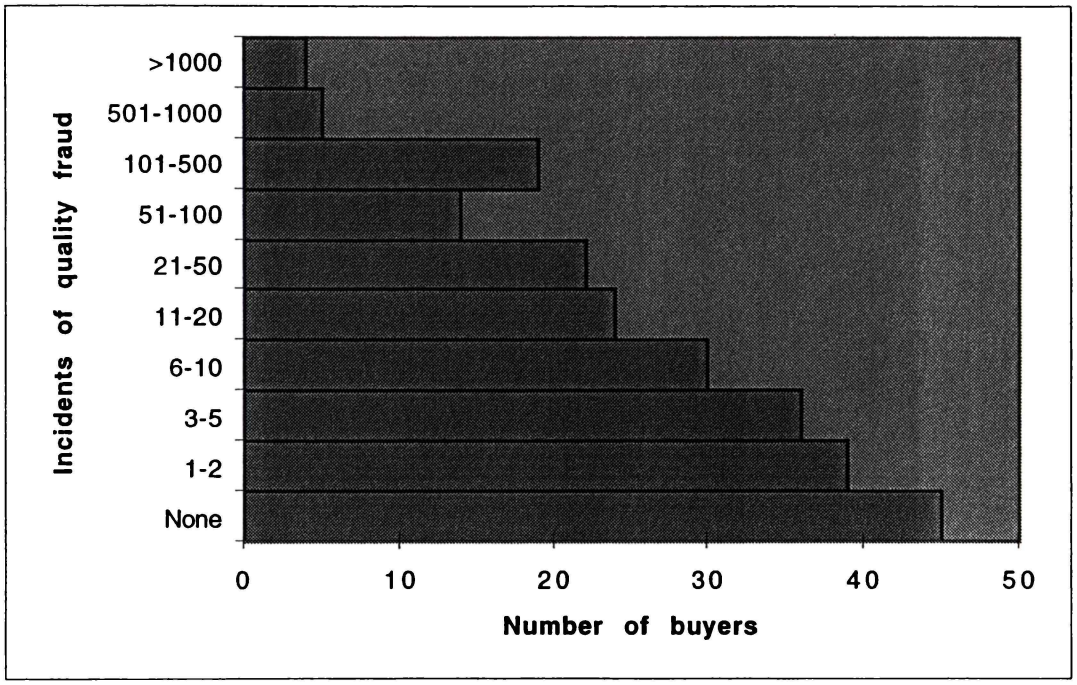
Response	Number	Percent
fought back	6	60
nothing	3	30
reported it to the police	1	10
Total	10	100

As would be expected many assault victims (60%) responded by fighting back. Nearly a third (30%) did nothing. One victim (10%) reported the incident to the police.

6.9.4 Incidence of Quality Fraud

Buyers were asked how many times they had paid for high quality cannabis but had received low quality cannabis in return. The results are presented in figure 6.16.

Figure 6.16: Incidence of Quality Fraud

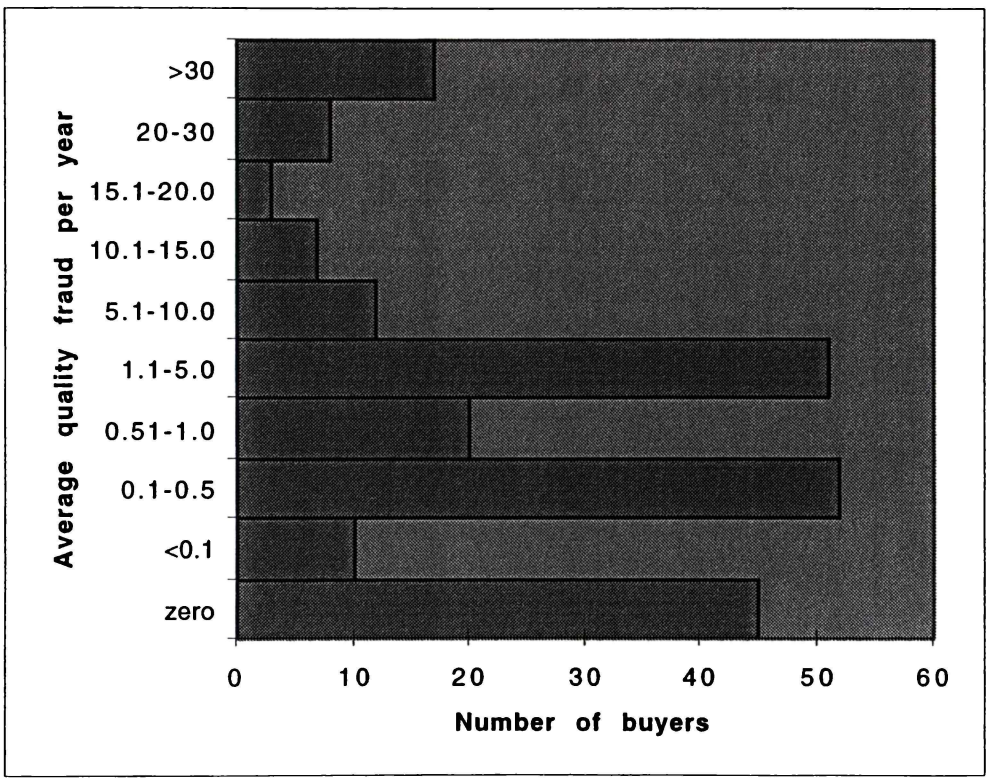


Incidents of quality fraud varied greatly from none to 3504 times. Only 18.9% of buyers had never suffered from quality fraud. Some buyers experienced only a few incidents of quality fraud. Thirty-five percent of buyers (35.3%) reported less than three incidences of quality fraud. Nearly one half (46.2%) of buyers experienced less than 5 incidents of quality fraud. However, some buyers reported numerous incidents of quality fraud. Thirty-seven percent of buyers reported over 10 incidents of quality fraud. Over a quarter of buyers (26.9%) reported over 20 incidents of quality fraud. Twelve percent of buyers (11.8%) reported over 100 incidents of quality fraud. Four

buyers (1.6%) reported over 1000 incidents of quality fraud, one reported 1373 incidents, two reported 2190 incidents, and one reported 3504 incidents.[6]

Figure 6.17 presents the average incidence of quality fraud per year per buyer.

Figure 6.17: Average Incidence of Quality Fraud per Year



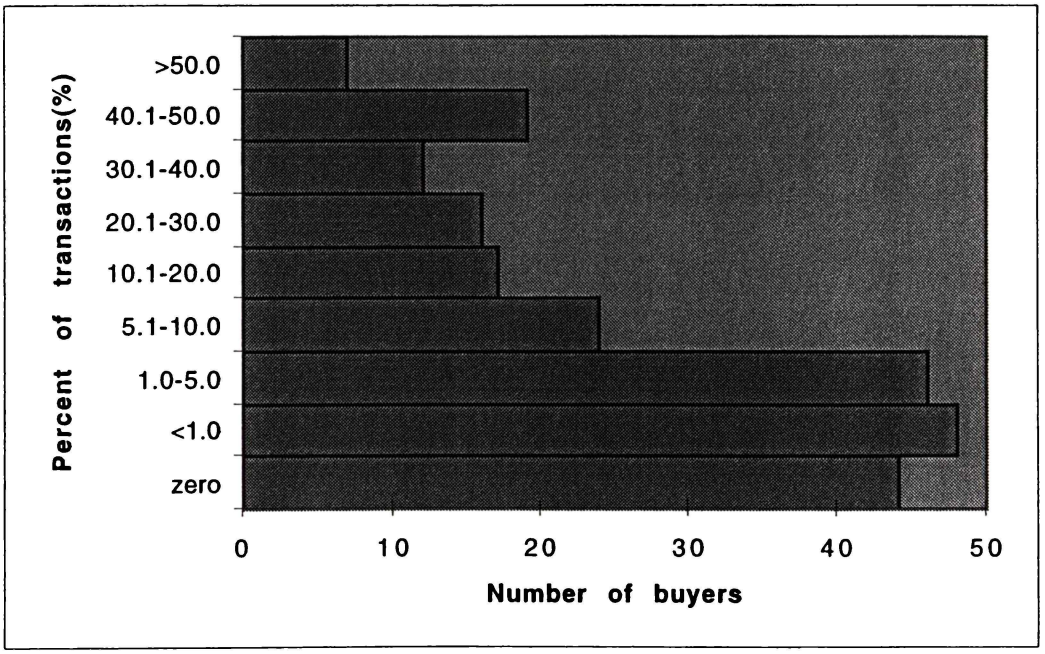
The average incidence of quality fraud per year ranged from zero to 146 times. Only 19.3% of buyers had never suffered from quality fraud. Nearly eighty percent of buyers (79.2%) suffered 5 or less incidents of quality fraud per year. However, 11%

[6] The latter figures were original percentage figures. They were calculated into an actual figure only after the number of transactions were calculated. Since the respondent did not know what this final figure was, it is difficult to know if they would have still considered it appropriate. When the total number of transactions is large, seemingly small percentages can actually represent very high incidents of cheating.

of buyers suffered from quality fraud more than 10 times per year, with 6.8% of buyers suffering from quality fraud more than 30 times a year. Eight buyers (3.4%) suffered from quality fraud over 50 times per year, five at 52 times per year, one at 62 times per year, one at 110 times per year, and one at 146 times per year. The average incidence of quality fraud per year for all buyers was 6.941 times. This is equivalent to 694.1 incidents of quality fraud per 100 people per year.

Figure 6.18 presents the incidence of quality fraud as a percentage of transactions.

Figure 6.18: Quality Fraud as a Percentage of Transactions



Rates of quality fraud ranged from 0% to 80% of transactions. Forty percent of buyers (39.5%) had a rate of quality fraud of less than 1% of transactions (ie. less than 1 transaction in 100 resulted in quality fraud). Fifty-nine percent of respondents (59.2%) had a rate of quality fraud of 5% or less of transactions. Over three-quarters of buyers (76.8%) had a rate of quality fraud of 20% or less of transactions. Eleven percent of

buyers (11.2%) had a rate of quality fraud over 40% of transactions. Four buyers (1.7%) had rates of quality fraud over 60% of transactions, one had a rate 71%, another had a rate of 75%, and two had a rate of 80%. The average incidence of quality fraud was 12.1%, with a standard deviation of 18.1%.

Table 6.17 breakdowns the average incidence of quality fraud by the self reported level of exclusivity.

Table 6.17: The Average Incidence of Quality Fraud by Level of Exclusivity

Variable	Mean	Std. Dev.	Cases
Entire population	12.4	18.4	220
Waybuy 10	14.2	18.6	129
Waybuy 20	11.3	19.4	69
Waybuy 30	5.6	12.0	22

(F_{obt} = 2.20, p = .1125)

Table 6.18 breakdowns the average incidence of quality fraud by number of transactions completed.

Table 6.18: The Average Incidence of Quality Fraud by Transactions Completed

Variable	Mean	Std. Dev.	Cases
Entire population	12.1	18.1	233
Trans 1	15.3	18.6	57
Trans 2	12.2	18.3	65
Trans 3	10.4	17.6	111

(F_{obt} = 1.40, p = .2495)

Those buyers who had experienced quality fraud were asked to explain what they did about it. The responses are presented in Table 6.19.

Table 6.19: Victims Responses to Quality Fraud

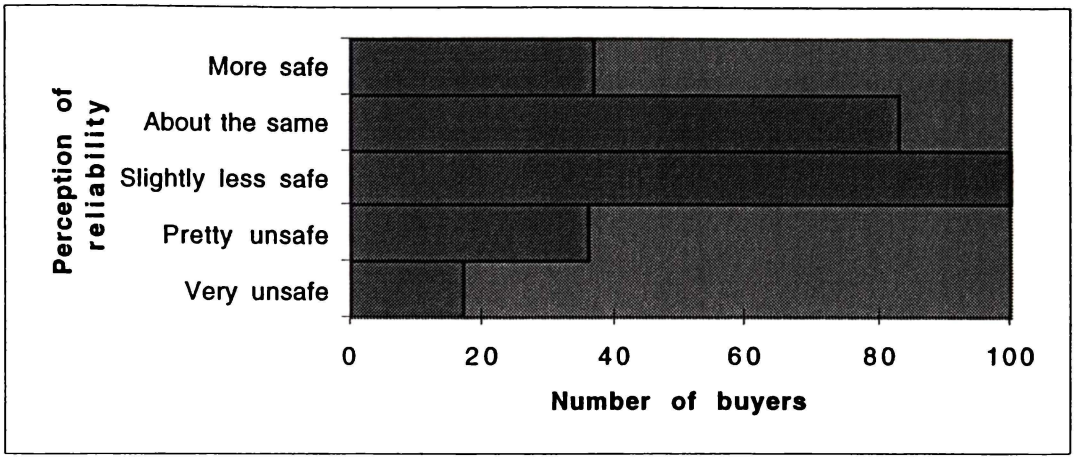
Response	Number	Percent
changed supplier/went elsewhere	72	31
nothing/accepted it	67	29
complained	46	20
got replacement/asked for money back	28	12
refused to pay/didn't buy it	7	3
attacked dealer	7	3
spread word to other buyers	5	1
tried to resell it	1	1
Total	233	100

Nearly one-third of victims (31%) responded to quality fraud by changing their supplier. Half of the victims either did nothing (29%) or complained (20%). Twelve percent of victims either got replacement drugs or their money back. Only 3% of victims responded to quality fraud with violence.

6.9.5 Buyers Assessment of the Reliability of the Cannabis Market

Buyers were asked how safe and reliable they considered cannabis transactions relative to legal transactions. They were provided with five statements about the reliability of cannabis transactions from which they were asked to chose one, "Very unsafe and unreliable," "Pretty unsafe and unreliable," "Slightly less safe and reliable than legal transactions," "About the same as legal transactions," and "More safe and reliable than legal transactions." The responses are presented in Figure 6.19.

Figure 6.19: The Reliability of Cannabis Transactions Compared to Legal Transactions



Just under one-third of buyers (30.4%) thought cannabis transactions were "About the same" as legal transactions. Just over one-third of buyers (36.6%) thought cannabis transactions were "Slightly less safe" than legal transactions. Fourteen percent of buyers considered cannabis transactions to be "More safe and reliable than legal transactions." Only 6.2% of buyers thought the cannabis market was "Very unsafe."

6.10 Reasons Cannabis Sellers did not Cheat

6.10.1 Introduction

The next group of assertions concerned the reasons why sellers did not cheat customers. Initially, sellers were asked to explain why they did not cheat buyers. They were then provided with eight reasons why they did not cheat sellers and asked to score the importance of each using the scale, 1 ("not important") to 7 ("very important"). Four of the reasons were from the model, "happy with money," "reputation," "limited number of people to sell to," and "selling stocks quickly." The other four reasons were traditional explanations for reliable drug transactions, "fear of

physical retaliation," "fear of attracting the police," "fear of betrayal to the police," and "concern about committing a more serious crime."

6.10.2 Sellers Reasons for not Cheating

Sellers were asked to explain why they did not cheat customers. Their responses are summarised in Table 6.20.

Table 6.20: Sellers Reasons for not Cheating Customers

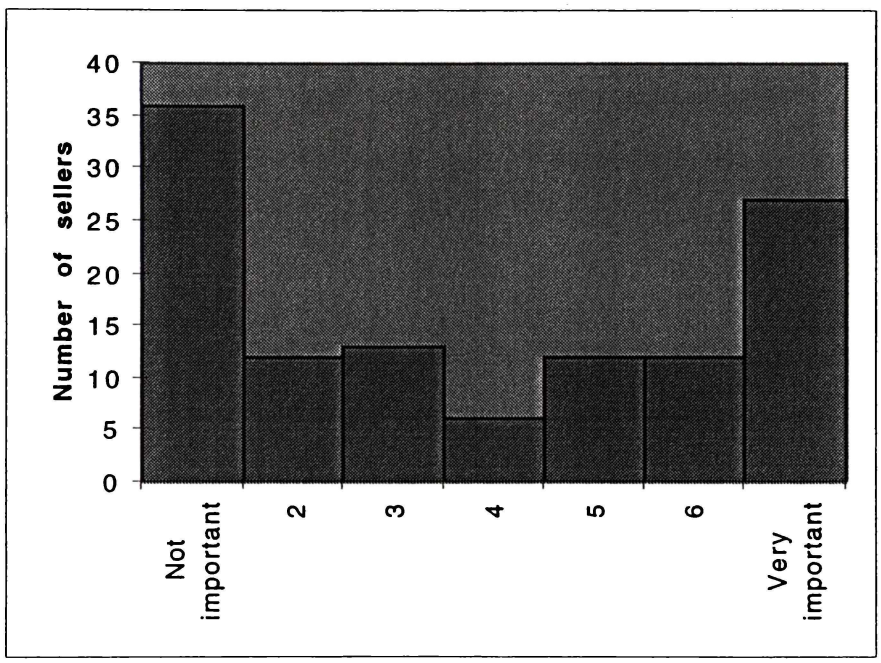
Response	Number	Percent
ethics/honest/honour/morally wrong	37	32
buyers will not return	31	27
buyers friends/family	22	19
risk physical retaliation	13	11
fear betrayal to police	3	3
avoid complaints	2	2
only sell to recoup money spent	2	2
personal experience as buyer (empathy)	2	2
builds trust	1	1
want transactions to be quick	1	1
Total	114	100

About a third of sellers (32%) said they didn't cheat customers because they believed it was ethically wrong. The 2% who answered, "personal experience as a buyer," could also be added to this category. Twenty-seven percent of sellers answered they didn't cheat customers because they wanted them to return for future purchases. Nineteen percent of sellers answered they didn't cheat customers because their customers were friends or family. Only 11% of sellers did not cheat customers because of fear of physical retaliation. Three percent of sellers did not cheat because they feared the cheated exchange partner would betray them to the police.

6.10.3 Fear of Physical Retaliation

Sellers may not cheat because they fear physical retaliation. The importance of "fear of physical retaliation" in a sellers decision not to cheat customers is presented in Figure 6.20.

Figure 6.20: The Importance of Fear of Physical Retaliation



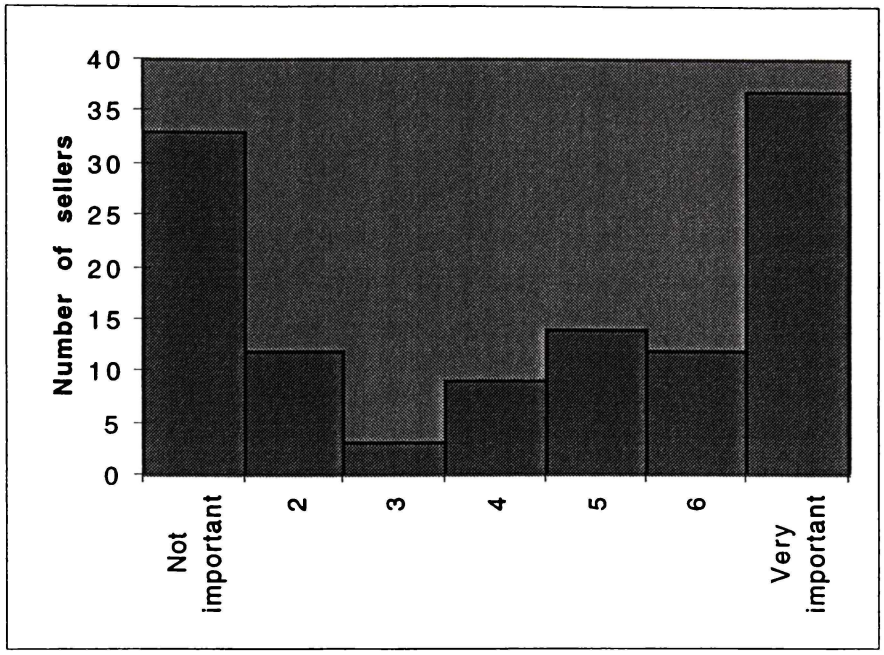
Nearly a third of sellers (30.5%) scored "fear of physical retaliation" an importance rating of 1 ("not important"). Fifty-two percent of sellers (51.7%) scored it a 3 or less on the scale. In direct contrast, 22.9% of sellers scored the reason a 7 ("very important"). The average score for the question was 3.8, with a standard deviation was 2.4. The majority of sellers thought "fear of physical retaliation was a fairly unimportant reason, some sellers thought it was important.

Ability with violence is likely to affect how a seller answered this question. Those who are proficient with violence may not fear physical retaliation even if the market is quite violent. Alternatively, those who are not comfortable with violence maybe concerned about the possibility of physical retaliation even if the market is generally peaceful.

6.10.4 Fear of Attracting the Police

Cheating can result in a verbal or physical confrontation which might attract the attention of neighbours or the police. Even the increased traffic from cheated customers returning to complain about drugs might be sufficient to alert the police. The importance of "fear of attracting the police" in a sellers decision not to cheat customers is presented in Figure 6.21.

Figure 6.21: The Importance of Fear of Attracting the Police



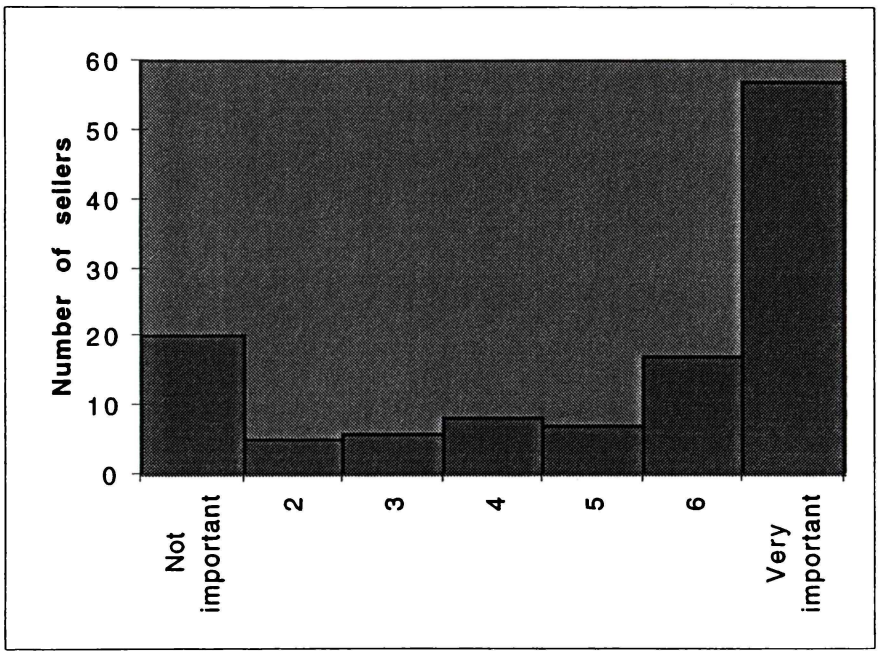
Nearly one-third of sellers (30.8%) scored "fear of attracting the police" an importance rating of 7 ("very important"). Fifty-three percent of sellers scored the reason a 5 or greater. In direct contrast, 27.5% of sellers scored "fear of attracting the police" a 1 ("not important"). The average score for the question was 4.2, with a standard deviation of 2.5. The majority of sellers thought "fear of attracting the police" was fairly important, other sellers thought it was not important.

The scale of cannabis selling may affect how this question was answered. Small scale sellers will only have a few customers who are less likely to attract neighbours and the police.

6.10.5 Difficulties with Finding Customers

The model indicated an important reason why sellers would not cheat was because it is difficult to find new buyers (n). The importance of "limited number of people to sell to" in a sellers decision not to cheat customers is presented in Figure 6.22.

Figure 6.22: The Importance of having a Limited Number of People to Sell to



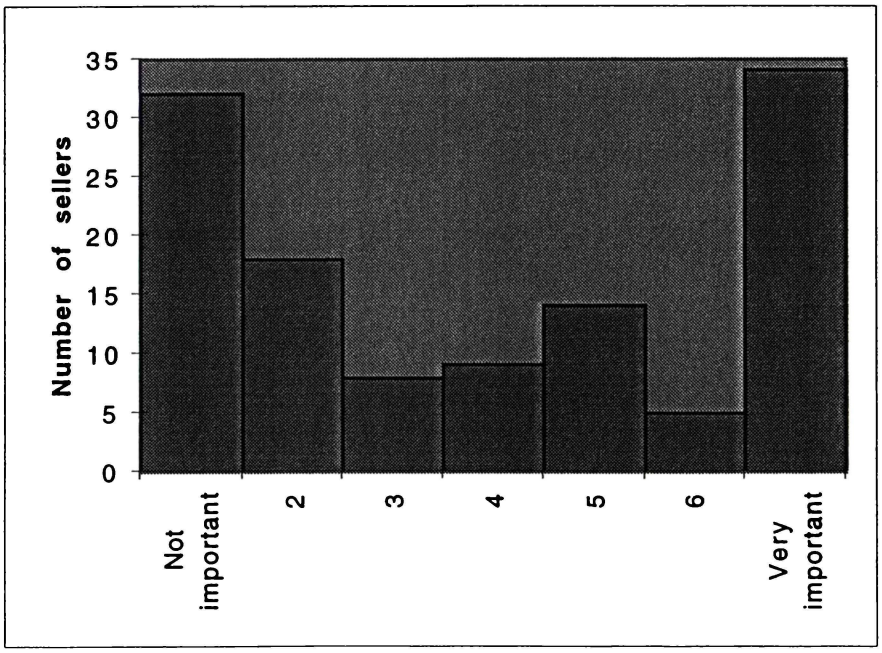
Nearly half of the sellers (47.5%) scored "limited number of people to sell to" an importance rating of 7 ("very important"). Sixty-two percent of sellers (61.7%) scored "limited number of people to sell to" a 6 or higher. In direct contrast, 16.7% of sellers scored this reason an importance rating of 1 ("not important"). The average score for the reason was 5.1, with a standard deviation of 2.3. The majority of sellers considered "limited number of people to sell to" to be a very important reason not to cheat buyers, a small minority thought it was not important.

Experience in the cannabis market may affect how a seller rates the importance of "limited number of people to sell to." If a seller is very experienced in the market they are likely to have many contacts in the marketplace which will provide good access to customers.

6.10.6 Fear of Betrayal to the Police

Sellers may not cheat because they fear a cheated exchange partner will betray them to the police. This could be achieved with little risk to the betrayer by making an anonymous phone call to the police. The importance of "fear of betrayal" in a sellers decision not to cheat customers is presented in Figure 6.23.

Figure 6.23: The Importance of Fear of Betrayal to the Police



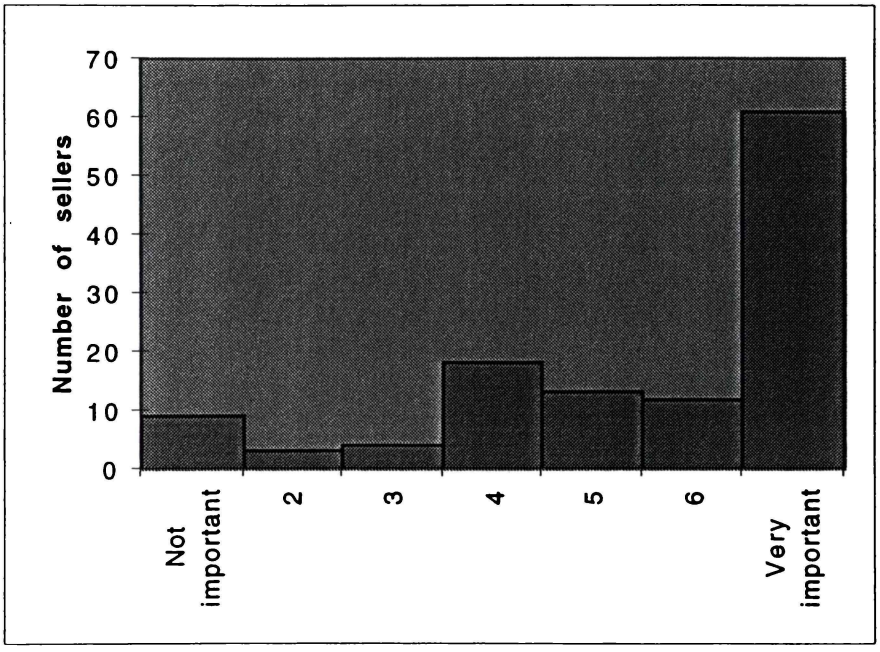
Twenty-seven percent of sellers (26.7%) scored "fear of betrayal to the police" an importance rating of 1 ("not important"). Forty-eight percent of sellers (48.3%) scored the reason a 3 or less. In direct contrast, twenty-eight percent of sellers (28.3%) scored the reason a 7 ("very important"). The average score for the question was 3.9, with a the standard deviation was 2.4. Many sellers thought "fear of betrayal to the police" was a fairly unimportant reason not to cheat customers, while many others thought it was fairly important.

The type of cheating committed is likely to affect the risk of betrayal to the authorities. The more serious the victimisation the more likely the buyer will go to the authorities. Scale of dealing is also likely to be a factor, with larger scale dealers more concerned about betrayal.

6.10.7 Happy with the Money

The model indicated an important reason why sellers would not cheat was because the benefits of exchange are high (Be). The importance of "happy with money" in a sellers decision not to cheat buyers is presented in Figure 6.24.

Figure 6.24: The Importance of Happy with Money

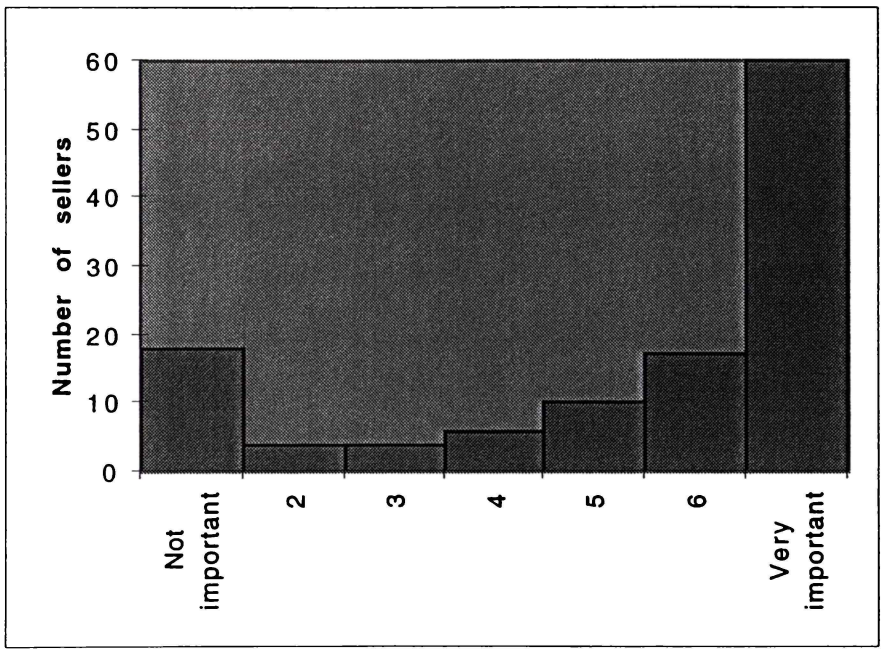


Fifty-one percent of sellers (50.8%) scored "happy with money" an importance rating of 7 ("very important"). Just over 60% of sellers (60.8%) scored "happy with money" a rating of 6 or higher. The average score for the question was 5.5, with a standard deviation of 1.9. The majority of sellers considered "happy with money" to be a very important reason not to cheat customers.

6.10.8 Worried about Reputation

The model indicated an important reason why sellers would not cheat was because a bad reputation would increase the time it took to find new buyers (n). The importance of "worried about reputation" in a sellers decision not to cheat customers is presented in Figure 6.25.

Figure 6.25: The Importance of Worried about Reputation



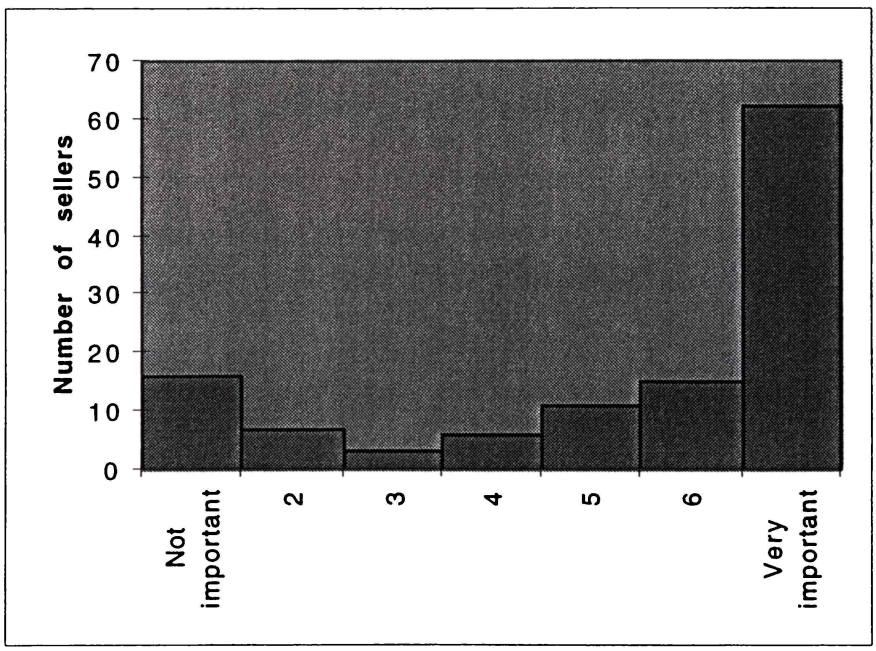
Fifty percent of sellers (50.4%) scored "worried about reputation" an importance rating of 7 ("very important"). Two-thirds of sellers (64.7%) scored "worried about reputation" a rating of 6 or higher. A minority of sellers (15.1%) thought "worried about reputation" was not important, scoring it a rating of 1. The average score for the reason was 5.3, with a standard deviation 2.2. The majority of sellers thought

"worried about reputation" to be a very important reason not to cheat customers, a small minority of sellers though it was not important.

6.10.9 The Quick Sale of Cannabis

Drug sellers can minimise their legal penalty by disposing of stocks of drugs quickly (U). This suggests they will not cheat customers. The importance of "able to sell stocks of cannabis quickly" in the decision not to cheat customers is presented in Figure 6.26.

Figure 6.26: The Importance of Able to Sell Stocks of Cannabis Quickly



Fifty-two percent of sellers scored "able to sell stocks of drugs quickly" an importance rating of 7 ("very important"). Two thirds of sellers (64.2%) scored it a 6 or higher. A minority of sellers (13.3%) scored it a 1 ("not important"). The average score for the question was 5.4, with a standard deviation of 2.2. The majority of sellers thought

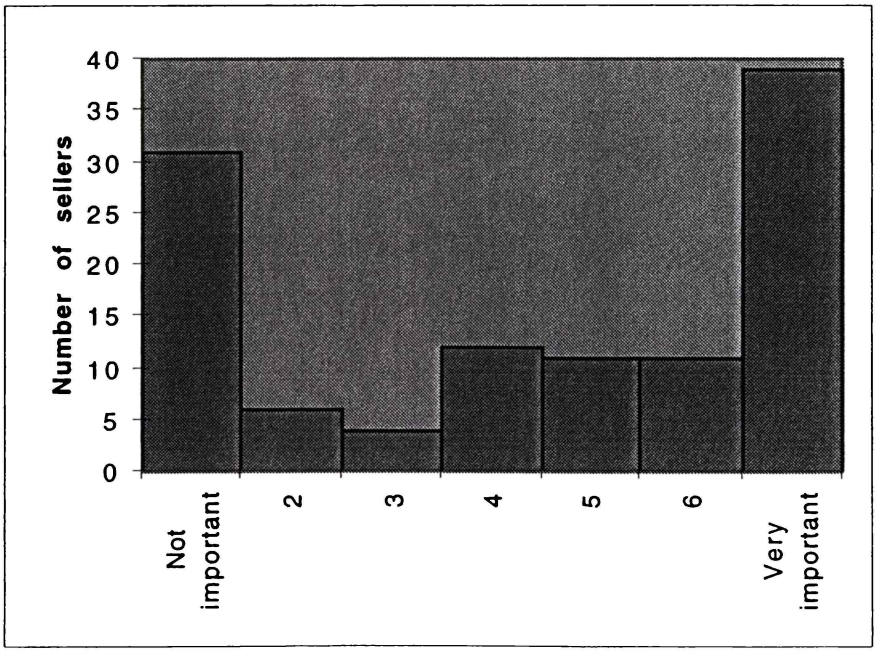
"able to sell stocks of drugs quickly" was a very important reason not to cheat customers, a small minority thought it was unimportant.

The scale of dealing is likely to affect how sellers answered this question. Small scale dealers are unlikely to ever hold large inventories of drugs.

6.10.10 Cheating may Result in Committing a More Serious Crime

Sellers may not cheat because they want to avoid committing a more serious offence than a drug offence. For example, robbery may lead to an assault. The importance of "cheating may result in committing a more serious crime" is presented in Figure 6.27.

Figure 6.27: The Importance of Cheating may Result in Committing a More Serious Crime



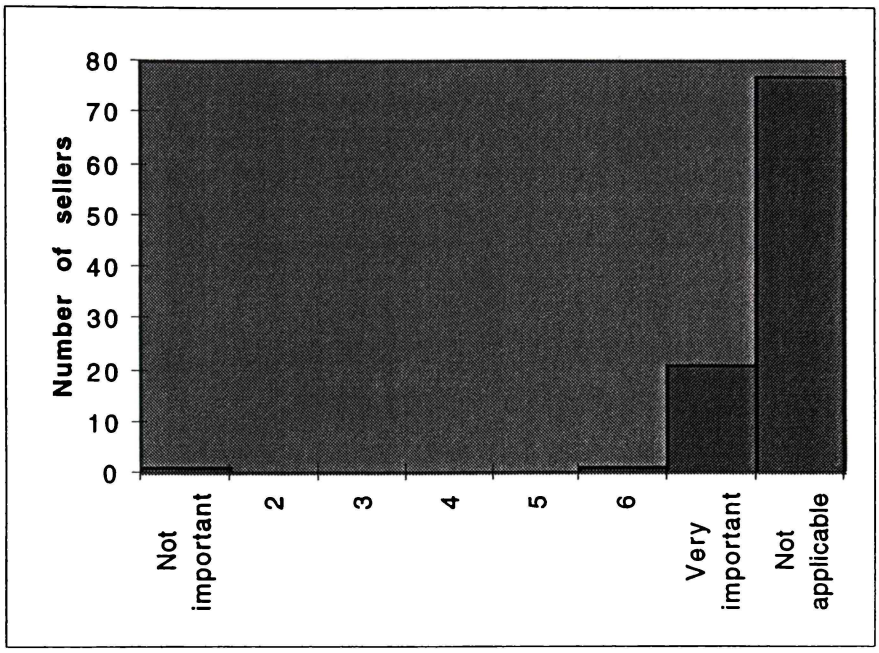
A third of sellers (34.2%) scored "cheating may result in committing a more serious offence" an importance rating of 7 ("very important"). Fifty-three percent of sellers (53.5%) scored the reason a 5 or higher. In contrast, twenty-seven percent of sellers (27.2%) scored the reason a 1 ("not important"). The average score for the question was 4.4, with a the standard deviation was 2.5. Many sellers thought the reason was fairly important, many other sellers considered it not important.

The scale of dealing is likely to affect how a seller answered this question. If dealing is large scale, involving significant financial rewards, and likely to result in a significant penalty, then committing additional crimes maybe considered acceptable.

6.10.11 Another Reason

At the end of the question sellers were invited to add their own reason why they did not cheat customers and score its importance. The results are presented in Figure 6.28.

Figure 6.28: The Importance of Another Reason



Twenty-three percent of sellers had an additional reason for not cheating customers. Twenty-one percent of sellers rated their reason a 7 ("very important"). Over three-quarters of sellers (77.0%) had no additional reason for not cheating customers (ie. "not applicable")

The "other reasons" provided by sellers for not cheating their customers are presented in Table 6.21.

Table 6.21: "Other Reasons" for not Cheating Customers

Response	Number	Percent
ethics/honesty/morally wrong	12	52
buyers will not return	6	26
buyers friends	5	22
Total	23	100

Half of the sellers who provided an additional reason (52%) responded, "personal ethics" was the reason why they did not cheat their customers. Twenty-six percent of sellers responded cheating was not good business practice, "cheated buyers will not return for future purchases." Twenty-two percent of sellers answered, they did not cheat customers because they were their friends. The "additional reasons" for not cheating customers are very similar to the responses to the open question at the beginning of the section.

6.11 The Characteristics of Cannabis Transactions

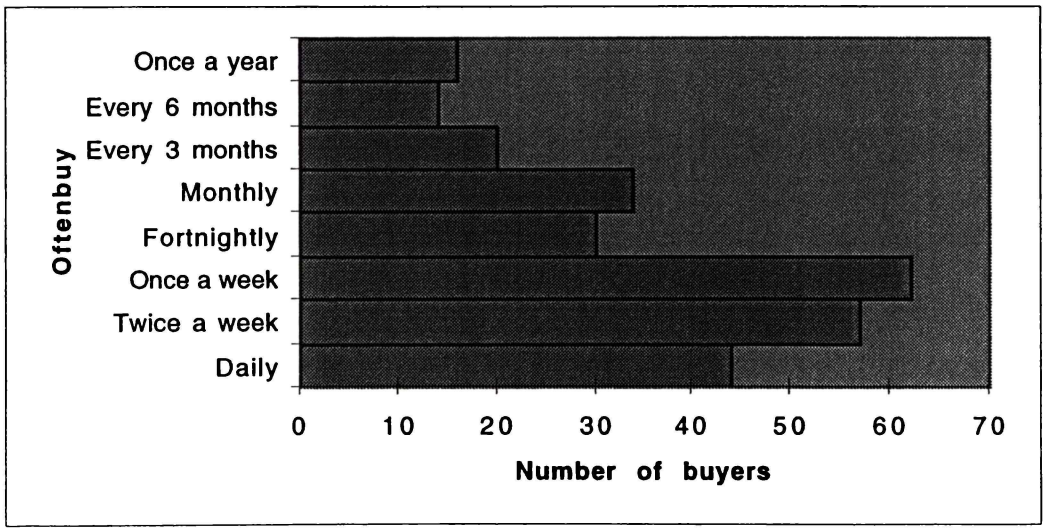
6.11.1 Introduction

The final group of assertions concerned the characteristics of cannabis transactions. These characteristics influenced key relationships and variables in the model and are influential in producing the assertions about the reliability of cannabis transactions.

6.11.2 Cannabis Transactions will be Regular

The model adapted the "ongoing interaction" solution to voluntary cooperation to retail illicit drug transactions. Illicit drug consumption was held to involve ongoing transactions because illicit drugs were a consumer item, and their euphoric and addictive qualities encouraged repeat consumption. Buyers were asked how often they bought cannabis. The results are presented in Figure 6.29.

Figure 6.29: How Often Cannabis is Purchased



The "Once a week" (22.4%) and "Twice a week" (20.6%) categories were the most popular, followed closely by "Daily" (15.9%). Over one-half of buyers (58.8%) bought cannabis once a week or more often. Over three-quarters of buyers (81.9%) bought cannabis once a month or more often.

The results of the question are consistent with the previous studies of cannabis in New Zealand. The national surveys of drug use in New Zealand found many people used cannabis fairly regularly (Field and Casswell, 1999b). Poulton *et al.* (1997) found

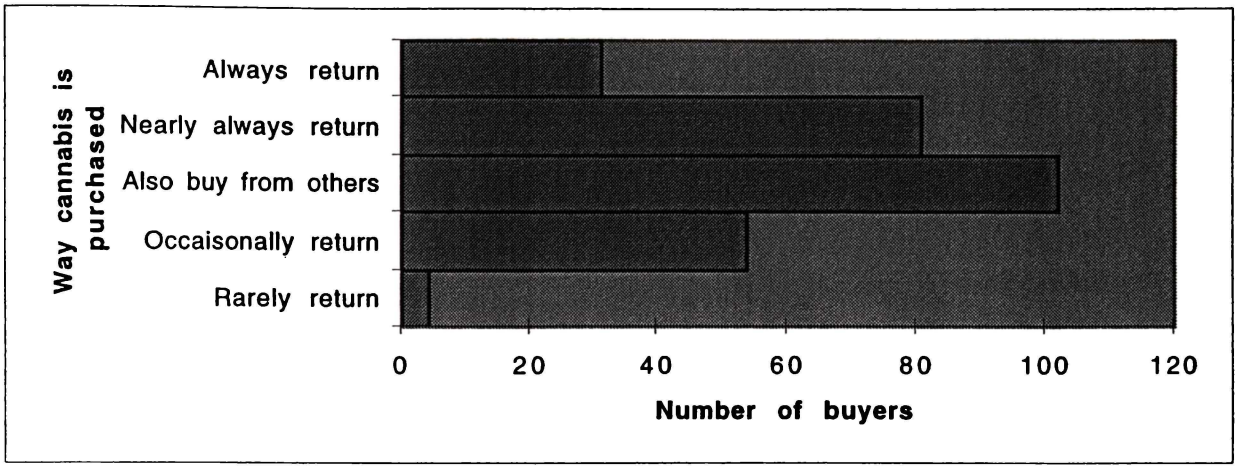
levels of cannabis use amongst a group of New Zealand young people to be fairly stable over the 7 years of the study. The results of the ALCP survey indicate a higher frequency of cannabis use than previously reported in the national surveys of drug use in New Zealand (see section 6.5). The difference maybe related to sample characteristics or survey methodology.

6.11.3 Buyers will Generally Return to the Same Cannabis Seller

The application of the ongoing solution to retail illicit drug transactions not only requires transactions to be ongoing, but also that the same exchange partners meet again and again in the future. High search costs in the illicit drugs market were held to create incentives to repeatedly return to the same exchange partner (see Geertz, 1978; 1979).

Buyers were asked to describe how they purchased cannabis by choosing one of the following statements: "I buy from different sellers, rarely returning to the same one," "I buy from different sellers, occasionally I return to the same one," "Many of my purchases are from the same seller, but I also buy from several other sellers," "I nearly always return to the same seller, I only occasionally buy from other sellers," and "I always buy from the same seller." The results are summarised in Figure 6.30.

Figure 6.30: The Way Cannabis is Purchased



Thirty-eight percent of buyers (37.5%) responded, "Many of my purchases are from the same seller, but I also buy from several other sellers." Just under one-third of buyers (29.8%) responded, "I nearly always return to the same seller, I only occasionally buy from other sellers." Eleven percent of buyers (11.4%) responded, "I always returned to the same seller." Only 1.5% of buyers responded, "I buy from different sellers, rarely returning to the same one."

How often a buyer purchased cannabis may affect how they answered this question. People who purchase very often (eg. daily or twice weekly) may need several buyers to ensure a reliable supply.

The next two questions were concerned with why buyers returned to the same seller. Initially, sellers were asked to provide their own reason why they returned to the same seller. Sellers were then provided with four reasons why they might return to the same seller and were asked to rate the importance of the reasons using a scale of 1 ("not important") to 7 ("very important").

6.11.3.1 Buyers Reasons for Returning to the Same Seller

Buyers were asked to explain why they returned to the same seller. A number of buyers provided more than one reason. The responses are presented in Table 6.22.

Table 6.22: Buyers Reasons for Returning to the Same Seller

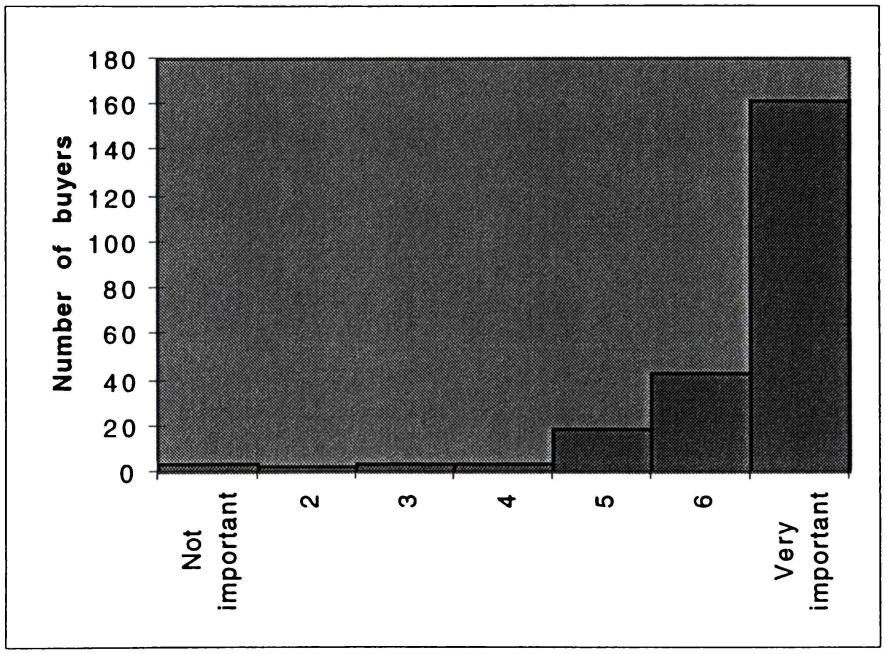
Response	Number	Percent
quality product	107	31
trustworthy/friend/family/flatmate	74	21
value for money/fair price/good Qty	44	13
reliable supply	41	12
safe/no hassles	29	8
convenient/close to where I live	19	6
provides credit	11	3
discretion/security	10	3
only person I know	9	3
gives free samples	2	.5
has different types of cannabis	1	.5
Total	347	100

The most popular reason to return to the same seller was they provided high quality cannabis (31%). The next most popular reason was they were trustworthy due to a close personal relationship, such as a friendship, family relationship, or flatmate (21%). The 3% who answered security as a motivation could also be included in this trustworthy category. Thirteen percent of buyers returned to the same seller because the seller offered good terms (ie. good price or good quantities). Twelve percent of buyers returned to the same seller because the seller was a source of regular supply. Only 3% of buyers returned to the same seller because they were the only seller they knew about.

6.11.3.2 Existing Seller Fair

In the model one of the reasons exchange parties returned to the same exchange partner was an existing exchange partner was considered to be more reliable than a new unattached exchange partner. The importance of "seller fair / honest" in the decision to return to the same exchange partner is presented in Figure 6.31.

Figure 6.31: The Importance of Fairness.

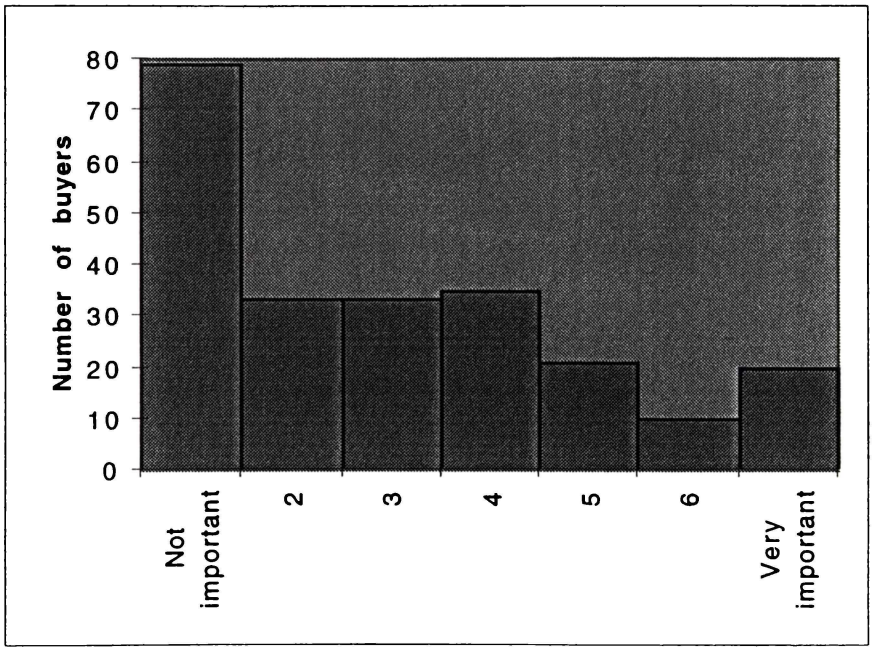


Just over two-thirds of buyers (67.9%) scored "fairness" an importance rating of a 7 ("very important"). Eighty-six percent of buyers scored it a 6 or greater. The average score for the question was 6.4, with a standard deviation of 1.2. The overwhelming majority of buyers thought fairness to be a very important reason to return to the same seller.

6.11.3.3 Difficult to Find an Alternative Supplier

In the model an important reason why exchange parties returned to the same exchange partner was because finding a new exchange partner was time consuming. The importance of "difficult to find an alternative supplier" in the decision to return to the same seller is presented in Figure 6.32.

Figure 6.32: The Importance of Finding Alternative Sellers



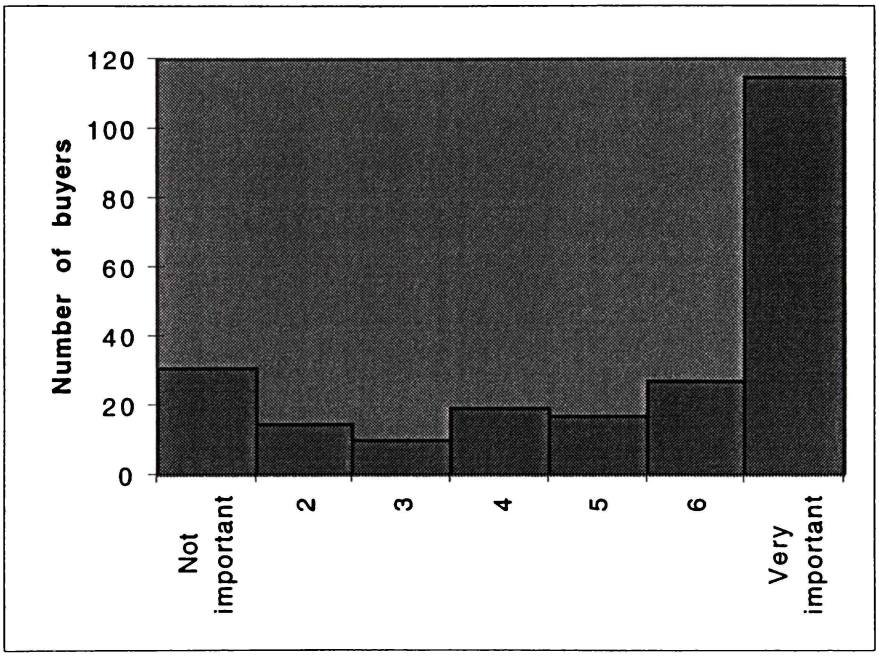
About a third of buyers (34.2%) scored "difficult to find an alternative supplier" a 1 ("not important"). Sixty-three percent of buyers (62.8%) scored it a 3 or lower. In contrast, 15.2% of buyers scored the reason a 4. The average score for the question was 3, with a standard deviation of 2. The majority buyers thought "difficult to find an alternative supplier" was fairly unimportant in the decision to return to the same seller, others though it was more important.

Experience is likely to affect how important this reason was to a buyer. Experienced buyers with a good personal knowledge of the local market will find it easier to locate alternative sellers. Relatively inexperienced buyers, or first time buyers, will find it much more difficult to locate sellers. Since the ALCP sample is a very experienced group of buyers it is not surprising that many thought locating alternative sellers was not an important problem. The statement was also badly worded. The explanation of the statement in the brackets read ("I do not know any other cannabis sellers"). This suggested the buyer had absolutely no knowledge of other sellers, rather than it would merely be time consuming to find a new exchange partner.

6.11.3.4 Reduce the Risk of Arrest

In the model one of the reasons exchange parties returned to the same exchange partner was an existing exchange partner was considered less likely to be an undercover police agent or informant. The importance of "reduce the risk of arrest" in the decision to return to the same seller is presented in Figure 6.33.

Figure 6.33: The Importance of Reduce the Risk of Arrest



Nearly one-half of buyers (49.1%) scored "reduce the risk of arrest" an importance rating of 7 ("very important"). Sixty-one percent of buyers (60.6%) scored it a 6 or higher. There was a dissenting minority (13.2%) who gave the reason a 1 ("not important"). The average score for the question was 5.2, with a standard deviation of

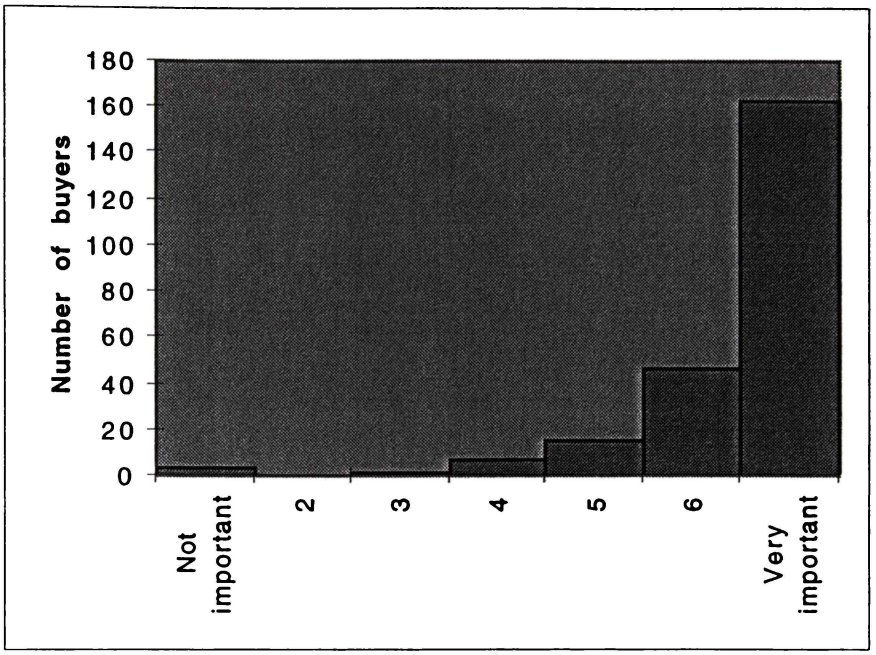
2.2. The majority of buyers thought "reduce the risk of arrest" was a very important reason to return to the same seller, a small minority thought it was not important.

The fear of arrest may be affected by a buyers level of involvement in the market and their knowledge of the law. If a buyer only ever purchases cannabis in very small weights, and is aware of the penalties involved, they know they are unlikely to receive anything more than a fine if arrested. For these people the fear of arrest maybe less important.

6.11.3.5 Seller Provides Good Quality Product

The standard economic reason to return to the same seller is they provide good quality product. The importance of "seller provides good quality product" in the decision to return to the same seller is presented in Figure 6.34.

Figure 6.34: The Importance of Seller Provides Good Quality Product

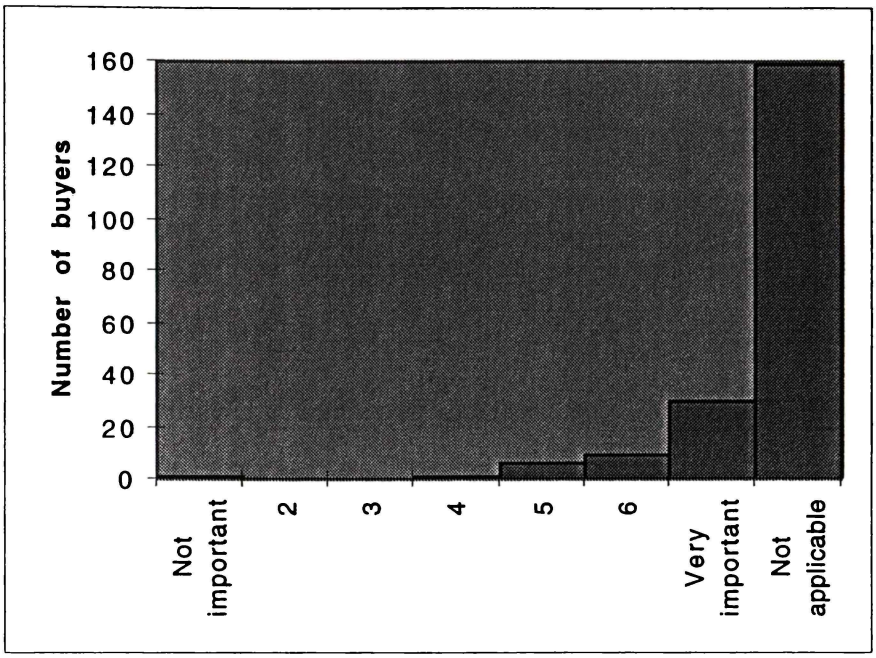


Sixty nine percent of buyers (69.1%) rated "seller provides good quality product" an importance rating of 7 ("very important"). Eighty-nine percent of sellers (88.6%) rated the reason a 6 or greater. The average score was 6.5, with a standard deviation of 1.1. The overwhelming majority of buyers considered "good quality product" to be a very important reason to return to the same seller.

6.11.3.6 Another Reason

Finally, buyers were given the opportunity to provide their own reason why they returned to the same seller and score its importance. The results are presented in Figure 6.35.

Figure 6.35: The Importance of Another Reason



Twenty-three percent of buyers (22.8%) had another reason to return to the same seller. Fifteen percent scored their reason an importance rating of 7 ("very important"). Over three-quarters of buyers (77.2%) had no "other reason" to return to the same seller (ie. the question was "not applicable" to them).

The "other reasons" provided by buyers for returning to the same seller are presented in Table 6.23. The table only includes the scored reasons.

Table 6.23: "Other Reasons" for Returning to the Same Seller

Response	Number	Percent
trustworthy/friend/personal acquaintance	22	47
reliable supply	7	15
convenient/close to where I live	6	13
value for money/good price/good Qty	5	11
provides credit	4	8
safety	3	6
Total	47	100

Nearly half of the buyers who provided an additional reasons (47%) responded a close personal relationship with the seller was the reason they returned to the same seller. Fifteen percent of buyers responded "reliable supply" was the reason they returned to the same seller. Thirteen percent responded "convenience" was the reason they returned to the same seller.

6.11.4 The Financial Value of Retail Cannabis Transactions will be Small, the Maximum Value of a Transaction will be $500

The model indicated the size of retail illicit drug transactions would be constrained by the financial difficulties with buying illicit drugs in large quantities, the fear of robbery and "rip-off," and the penalty structure of the *Misuse of Drugs Act 1975* and its judicial interpretation. The *Misuse of Drugs Act 1975* would restrict the size of a transaction to a maximum of $500. Buyers were asked how much they normally spent on cannabis per transaction. The results are presented in Figure 6.36 and Figure 6.37. A number of buyers (53) provided spending ranges rather than a single amount. Figure 6.36 presents the low range of these amounts. Figure 6.37 presents the high range of these amounts.

Figure 6.36: Amount Spent on Cannabis per Transaction (Low Ranges)

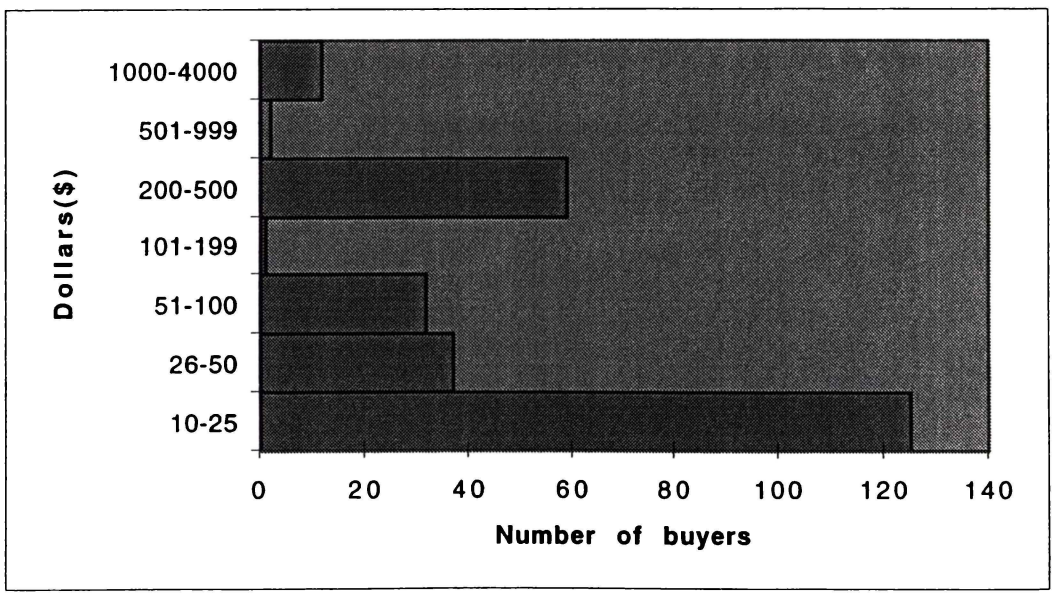
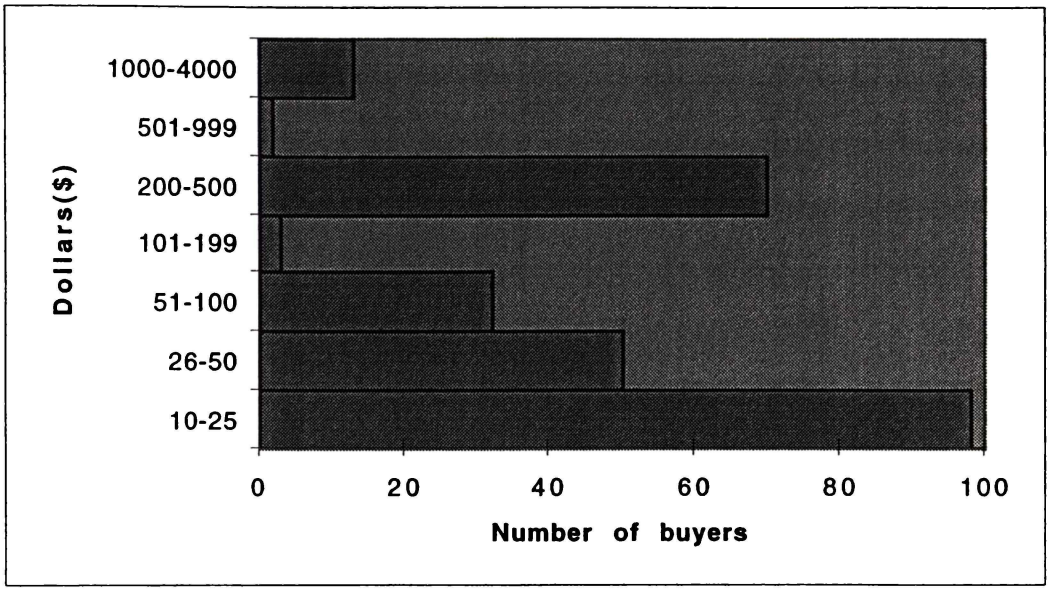


Figure 6.37: Amount Spent on Cannabis per Transaction (High Ranges)



The amounts spent correspond to the price of common units of cannabis sale, bullets ($20-25), ounces ($200-500), and pounds ($1000-4000). In the low range, 46.6% of buyers spent $25 or less per transaction (the price of a bullet). Sixty percent of buyers (60.4%) spent $50 or less per transaction (the price of 1-2 bullets). Nearly three-quarters of buyers (72.4%) spent $100 or less per transaction. Twenty-two percent of buyers spent between $200-500 (the price of an ounce). Only 5.2% of buyers spent over $500 per transaction, 4.5% of these spent between $1000 and $4000 per transaction (the price of a pound).

In the high range, 36.6% of buyers spent $25 or less per transaction. Just over half of buyers (55.2%) spent $50 or less per transaction. Two-thirds of buyers (67.2%) spent $100 or less. A quarter of buyers (26.1%) spent between $200-500. Only 5.6% of

buyers spent over $500 per transaction, 4.9% of these spent between $1000 and $4000 per transaction.

The next two questions were concerned with why buyers spent the mount they did on cannabis per transaction. Initially, buyers were asked to provide their own reason why they spent the amount they did per transaction. Buyers were then provided with three reasons why spent the amount they did per transaction, and were asked to rate the importance of each reason using the scale of 1 ("not important") to 7 ("very important").

6.11.4.1 Buyers Reasons Why they Spent an Amount on Cannabis per Transaction

Buyers were asked to explain why they spent the amount they did on cannabis per transaction. Their responses are summarised in Table 6.24

Table 6.24: Buyers Reasons for Spending on Cannabis per Transaction

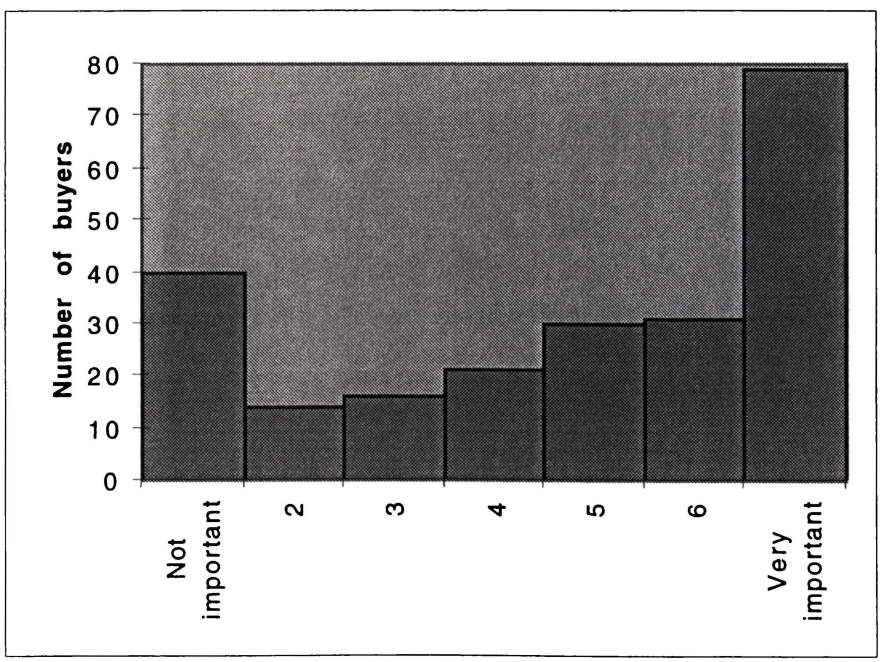
Response	Number	Percent
budget	44	25
going rate/set price	36	21
consumption limit	25	14
a good quantity	23	13
cheaper to buy in bulk	17	10
buy bulk to resell	7	4
don't want to be caught with alot on me	7	4
bulk purchase reduces number of transaction	5	3
to get quality	5	3
easy to obtain this amount	3	2
can easily got back for more	1	1
Total	173	100

A quarter of buyers (25%) responded "budget constraint" determined what they spent on cannabis. Twenty-one percent of buyers did not give the question much thought simply answering what they spent was the price set by the market. Fourteen percent indicated their "consumption limit" determined how much they spent. A further 13% indicated the amount purchased was a good amount, presumedly for their consumption level. Ten percent answered they bought in bulk because it was better value for money. Only 4% indicated they purchased the amount they did to avoid greater legal penalties.

6.11.4.2 Budget Constraint

The first explanation for the level expenditure on cannabis was budget constraint. The importance of "budget constraint" in a buyers decision about how much to spend on cannabis is presented in Figure 6.38.

Figure 6.38: The Importance of Budget Constraint



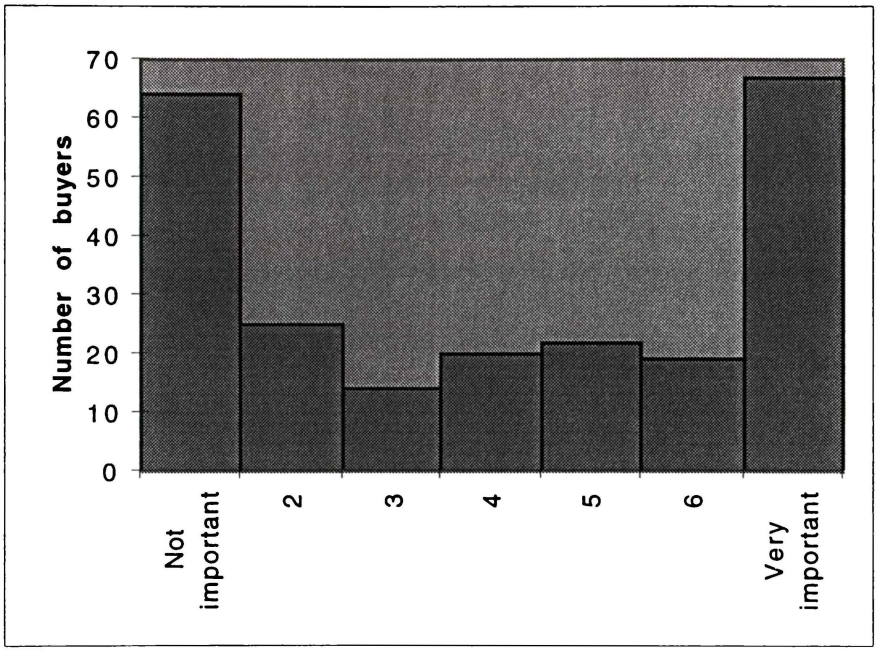
One-third of buyers (34.2%) scored "budget" an importance rating of 7 ("very important"). Nearly one-half of buyers (47.6%) scored the reason a 6 or higher. In contrast, 17.3% of buyers scored it a 1 ("not important"). The average for the question is 4.7, with a standard deviation of 2.3. Many buyers thought "budget constraint" was fairly important, others thought it was less important.

Income level will affect how a buyer answered this question. Those on low incomes are more likely to consider budget important. Quantity of purchase is also likely to be a factor. Bullet purchases ($20) will pose a far less strain on budget than ounce purchases ($200-$500).

6.11.4.3 Legal Penalty

In the model the penalty structure of the *Misuse of Drugs Act 1975* restricted the size of transactions. The importance of "legal penalty" in buyers decisions about how much to spend on cannabis per transaction is presented in Figure 6.39.

Figure 6.39: The Importance of Legal Penalty



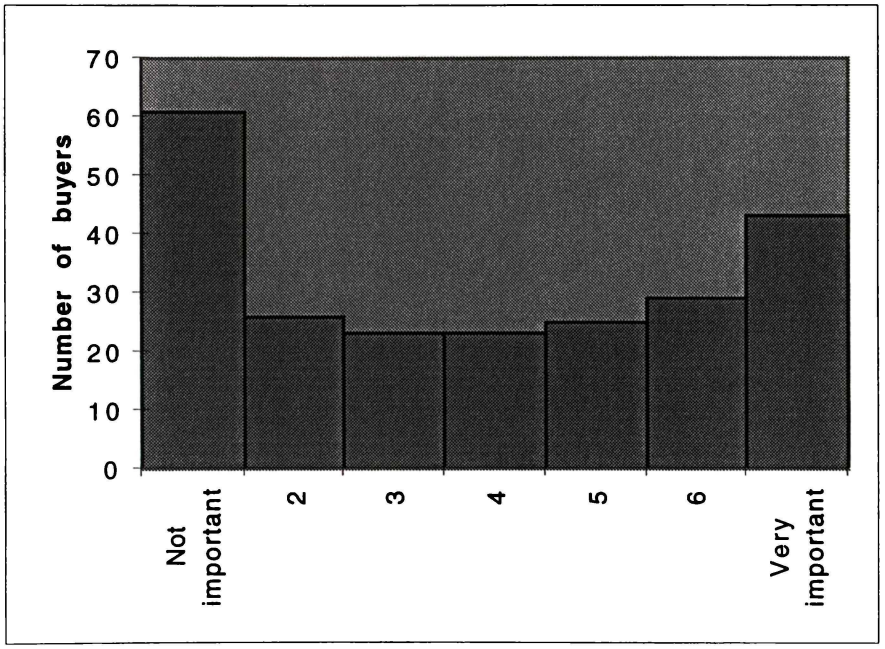
Twenty-nine percent of buyers scored "legal penalty" an importance rating of 7 ("very important"). In direct contrast, almost an equal number of buyers (27.7%) scored the reason a 1 ("not important"). The average for the question was 4, with a standard deviation of 2.5. Some buyers though "legal penalty" was important in the decision about size of purchase, other buyers thought it was less important.

The intended size of purchase will influence how a buyer answered this question. For many buyers the $500 limit set by the *Misuse of Drugs Act 1975* will not be relevant from the beginning. If they only intend to buy cannabis in small quantities, bullets for example ($20), then they are already well within the limits set by the *Misuse of Drugs Act 1975*. A large number of buyers in the ALCP sample (67-72%) spent $100 or less on cannabis per transaction. Alternatively, if a buyer is a high level dealer who needs to buy cannabis in pounds the limit is again not relevant. A buyers previous criminal record will also affect how seriously they view future arrest. First time offenders usually only receive a fine while repeat offenders are more likely to receive a prison term.

6.11.4.4 Consumption Limit

The final reason to explain the amount a person spent on cannabis per transaction was "consumption limit." The scores for this reason are presented in Figure 6.40.

Figure 6.40: The Importance of Consumption Limit

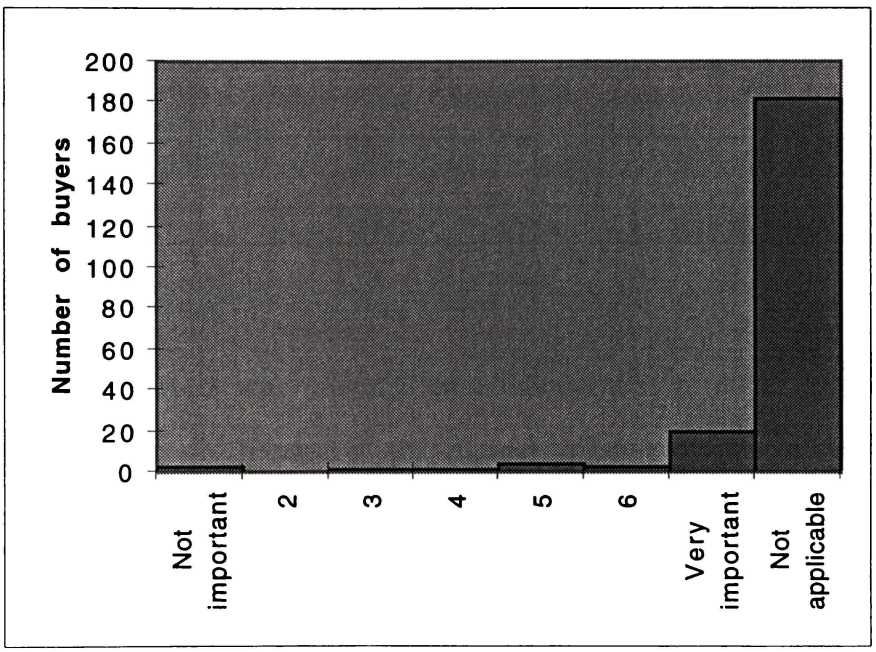


Over a quarter of buyers (26.5%) scored "consumption limit" an importance rating of 1 ("not important"). In direct contrast, 18.7% of buyers scored the reason a 7 ("very important"). The average score for the question is 3.8, with a standard deviation of 2.3. Many buyers though "consumption level" was not an important, others thought it was more important.

6.11.4.5 Another Reason

Finally, buyers were invited to add any "other reasons" why they spent the amount they did on cannabis per transaction, and score its importance using the scale. The results are presented in Figure 6.41.

Figure 6.41: The Importance of Another Reason



Only 14.2% of buyers had an additional reason. Nine percent of these rated their reason a 7 ("very important"). Eighty-six percent of buyers (85.8%) did not have any additional reason.

The "other reasons" provided by buyers for the amounts spent on cannabis per transaction are presented in Table 6.25.

Table 6.25: Other Reasons for Spending on Cannabis Per Transaction

Response	Number	Percent
cheaper to buy in bulk	14	47
budget	5	17
consumption limit	3	10
buy bulk to resell	3	10
bulk purchase reduces frequency of transactions	2	7
going rate/set price	2	7
offered in bulk	1	2
Total	30	100

Nearly half of the buyers who provided an additional reason (47%) responded they spent the amount they did because it was cheaper to buy cannabis in bulk. Budget constraint (17%), and consumption limit (10%), were the next most popular reasons added. Ten percent of buyers responded they bought cannabis in bulk for the purposes of reselling.

6.12 Conclusion

This chapter has presented data collected in a postal questionnaire of members of the ALCP. The overall response rate of the questionnaire was 30% (n = 357). The ALCP sample provides a detailed picture of the cannabis transactions of a large number of regular cannabis buyers and sellers throughout New Zealand. The information collected in the questionnaire can be used to make cautious observations about the cannabis market in New Zealand as a whole. The objective of the questionnaire was to measure the level of cheating in cannabis transactions in New Zealand, and to identify the important variables in the decision not to cheat on transactions.

6.12.1 The Reliability of Cannabis Transactions

The first group of assertions concerned the reliability of cannabis transactions. The model predicted product fraud, robbery, and assault would be rare, whereas quality fraud would be relatively common. A range of statistical analysis was used to test the reliability of cannabis transactions.

Table 6.26 presents the percentage of the ALCP sample who had never experienced a type of cheating, and the percentage of the ALCP sample who experienced a type of cheating less than three times, for each type of cheating.

Table 6.26: The Percentage of the ALCP Sample who had never Experienced a Type of Cheating, and Percentage Experienced Cheating less than Three Times Ever

	Never Experienced	Less than 3 Times
Quality Fraud	18.9	35.3
Product Fraud	78.5	92.6
Robbery	90.5	97.1
Assault	96.4	99.6

Most buyers (78.5%) had never suffered from product fraud. The overwhelming majority of buyers (91-96%) had never been robbed or assaulted. The overwhelming majority of buyers (93-100%) had experienced product fraud, robbery, and assault less than 3 times. In contrast, only 18.9% of buyers had never suffered from quality fraud. Only 35.3% of buyers had experienced quality fraud less than three times.

Table 6.27 presents the level of cheating per year, and average level of cheating per year, for each type of cheating.

Table 6.27: Level of Cheating per Year and Average Level of Cheating per Year for ALCP Sample

	< 0.1	< 1.0	> 5.0	Average Times per Year
Quality Fraud	24.0	56.5	20.8	6.941
Product Fraud	84.3	96.9	0.8	0.232
Robbery	93.7	100	-	0.191
Assault	98.3	100	-	0.005

The overwhelming majority of buyers (84-98%) suffered from product fraud, robbery, and assault, less than 0.1 times per year on average (less than 1 time in 10 years). No buyers suffered from robbery and assault more than 0.5 times per year. Only 0.8% of buyers suffered from product fraud more than 5 times per year. In contrast, only 24.0% of buyers experienced quality fraud less than 0.1 times per year on average. Twenty-one percent of buyers (20.8%) suffered from quality fraud more than 5 times per year.

The average level of cheating per year for the whole sample does not provide a very good description of the data. This is because the data is extremely positively skewed. A large proportion of the sample were never cheated (ie. zero scores). For robbery and assault in particular there are very few actual cases of cheating reported. The solution is to use the median to describe the data rather than the mean (Heiman, 1996).

The average level of cheating per year for the ALCP sample can be used to calculate the number of incidents of cheating per year per 100 people. This can be compared with the range of number of offences (per 100 people) in New Zealand as a whole. Figure 6.28 presents the comparison.

Table 6.28: Cheating (per 100 people) of ALCP Sample Compared to the Range of Number of Offences (per 100 people) in New Zealand

	Cheating of ALCP in Cannabis Mkt (per 100 people)	Offence Range for New Zealand (per 100 people)
Quality Fraud	694.1	0.96 - 7.0
Product Fraud	23.2	0.96 - 7.0
Robbery	1.9	0.05 - 1.0
Assault	0.5	0.75 - 13.4

Product fraud in the ALCP sample (per 100 people) is above the range of fraud in New Zealand (per 100 people) suggesting the cannabis market is less reliable in this respect than New Zealand as a whole. There were approximately three times as many product frauds in the ALCP sample than New Zealand as a whole. Robbery in the ALCP sample (per 100 people) is above the range of robbery in New Zealand (per 100 people) suggesting the cannabis market is less reliable in this respect than New Zealand as a whole. There were double the number of robberies in the ALCP sample than New Zealand as a whole. Assault in the ALCP sample (per 100 people) is below the range of assault in New Zealand (per 100 people) suggesting the cannabis market is more reliable in this respect than New Zealand as a whole. There were one third less

assaults in the ALCP sample than New Zealand as a whole. Quality fraud in the ALCP sample (per 100 people) is well above the range of fraud in New Zealand (per 100 people) suggesting the cannabis market is very unreliable in this respect compared to New Zealand as a whole. There were approximately 100 times more incidents of quality fraud in the ALCP sample than New Zealand as a whole.

The skewed nature of the data indicates the median rather than the mean should be used to describe the sample. Table 6.29 to 6.30 present the proportion the ALCP sample who would have a level of cheating (per 100 people) within or below the range of offences (per 100 people) for New Zealand as a whole.

Table 6.29: Proportion of ALCP Sample with Levels of Product Fraud (per 100 people) Below or Within the Range of Fraud (per 100 people) for New Zealand

	Range of Product Fraud (per 100 people) for New Zealand		
	< 0.96	0.96 - 7.0	>7.0
Product Fraud	79.4	4.5	16.1

Table 6.30: Proportion of ALCP Sample with Levels of Robbery (per 100 people) Below or Within the Range of Robbery (per 100 people) for New Zealand

	Range of Robbery (per 100 people) for New Zealand		
	< 0.05	0.05 - 1.0	>1.0
Robbery	90.7	0.0	9.3

Table 6.31: Proportion of ALCP Sample with Levels of Assault (per 100 people) Below or Within the Range of Assault (per 100 people) for New Zealand

	Range of Assault (per 100 people) for New Zealand		
	< 0.75	0.75 - 13.4	>13.4
Assault	96.4.	1.9	1.9

Table 6.32: Proportion of ALCP Sample with Levels of Quality Fraud (per 100 people) Below or Within the Range of Fraud (per 100 people) for New Zealand

	Range of Quality Fraud (per 100 people) in New Zealand		
	< 0.96	0.96 - 7.0	>7.0
Quality Fraud	19.3	1.7	79.0

A large proportion of buyers (84-98%) had levels of product fraud, robbery, and assault (per 100 people) within or below the range of these offences (per 100 people) for New Zealand. This is predominantly because a large proportion of buyers (79-96%) had never suffered from product fraud, robbery, and assault. Only a very small proportion of buyers (2-16%) had levels of product fraud, robbery, and assault, above the range of these offences (per 100 people) for New Zealand. In contrast, only 21.0% of buyers had levels of quality fraud (per 100 people) within or below the range of fraud (per 100 people) for New Zealand. Over three-quarters of buyers (79%) had levels of quality fraud (per 100 people) above the levels of fraud (per 100 people) for New Zealand as a whole.

The level of cheating (per 100 transactions) and average level of cheating (per 100 transactions) was calculated for each type of cheating. The results are presented in Table 6.33.

Table 6.33: Cheating (per 100 transactions) and Average Cheating (per 100 transactions) of ALCP Sample

	Number of Times Cheated per 100 Transactions			
	< 0.1	< 1.0	> 5.0	Average
Quality Fraud	21.0	39.5	40.8	12.1
Product Fraud	85.3	93.1	4.2	1.0
Robbery	93.5	98.5	0.8	0.16
Assault	97.7	99.2	0	0.02

Between 85-98% of buyers experienced product fraud, robbery, and assault, less than 0.1 times per 100 transactions (less than 1 time in 1000 transactions). Only 4% of buyers experienced product fraud more than 5 times in 100 transactions. Only 0.8% of buyers experienced robbery more than 5 times in 100 transactions. No one experienced assault more than 5 times in 100 transactions. In contrast, only 21% of buyers experienced quality fraud less than 0.1 times in 100 transactions. Forty-one percent of buyers experienced quality fraud more than 5 times in 100 transactions.

Buyers were asked how safe and reliable they considered cannabis transactions relative to legal transactions. Two-thirds of buyers (67%) thought cannabis transactions were "About the same" as legal transactions, or only "Slightly less safe" than legal transactions. Fourteen percent of people considered cannabis transactions to be "More

safe and reliable than legal transactions." Only 6.2% of buyers thought the cannabis market was "Very unsafe."

(iii) Buyers will respond to cheating by changing sellers or by doing nothing, rather than with violence

Most buyers (66-80%) responded to the different types of cheating by either doing "nothing" or "changing their supplier." Only a small minority of buyers (3-15%) responded with violence. The exception was assault, where many victims (60%) reported "fighting back."

6.12.2 The Explanation for Cheating

The model suggested the exclusivity of exchange relationship, and number of transactions completed, could be used to explain the level of cheating. The average cheating (per 100 transactions) was broken down by the exclusivity of exchange relationship, and number of transactions completed. Cheating should fall as exchange relationship becomes more exclusive, and as the number of transactions completed increases. The acceptable level of sampling error is 5%.

The breakdown of the average level of cheating by exclusivity revealed only a rough a rough indication of causality. Table 6.34 presents the results of the F-test for exclusivity of exchange relationship.

Table 6.34: F-test of the Relationship between Average Cheating (per 100 transactions) by Exclusivity of Exchange Relationship of ALCP Sample

	F_{obt}	Significance
Quality Fraud	2.21	.1125
Product Fraud	0.35	.6991
Robbery	0.83	.4357
Assault	2.29	.1026

The probability of sampling error is high (ie. > 0.05). There is little evidence of a relationship between exclusivity of exchange relationship and average level of cheating. The large number of buyers who had never been cheated (ie. 0 scores), and the wide range of experience of the small number of people who had been cheated, made the mean problematic. The standard deviations of average levels of cheating were very large relative to means. This is a common occurrence in surveys of crime because many types of victimisation are very rare (see Statistics New Zealand, 1996a; Young *et al.*, 1997). A range of other variables were tested as explanatory variables for average level of cheating including, how often cannabis was purchased, how long cannabis had been purchased, and the amount spent on cannabis per transaction. Similar high probabilities of sampling error were found.

In retrospect it is easy to see attempting to explain the average level of cheating with one variable was a very demanding objective. Statistics New Zealand (1996a) indicated a range of social and demographic variables influenced the level and type of victimisation in a particular place at different times, including population density, age structure, gender, ethnicity, educational status, and income and employment. Explaining the

level of cheating in individual cases was beyond the original objectives of the survey. The model was concerned with explaining the level of cheating at market level, rather than explaining why particular individuals were cheated.

The breakdown of the average level of cheating by transactions completed suggested a stronger causality. Average levels of quality fraud, product fraud, robbery and assault, all fell as the number of transactions completed increased. Table 6.35 presents the results of the F-test for number of transactions.

Table 6.35: F-test of the Relationship between Average Cheating (per 100 transactions) by Number of Transactions Completed of ALCP Sample

	F_{obt}	Significance
Quality Fraud	1.39	.2495
Product Fraud	3.79	.0237
Robbery	4.35	.0138
Assault	1.37	.2541

Again, the probability of sampling error was fairly high, but product fraud and robbery produced relatively low probabilities (ie. < 0.05). The evidence of a relationship between the number of transactions completed and average level of cheating is not strong.

6.12.3 The Reasons Sellers do not Cheat Buyers

Sellers were initially asked why they did not cheat buyers. The most popular reason sellers gave for not cheating buyers was they thought it was "ethically wrong" (32%). The next most popular explanation was "buyers will not return" (27%), followed by "buyers are friends or family" (19%). Only 11% of sellers answered "fear of physical retaliation."

The model identified four reasons why sellers would not cheat buyers, "happy with money," "reputation," "limited number of people to sell to," and "selling stocks quickly." These reasons were contrasted with four traditional reasons for not cheating, "fear of physical retaliation," "fear of attracting the police," "fear of betrayal to the police," and "concern about committing a more serious crime." Sellers rated the importance of each reason in the decision not to cheat buyers using the scale, 1 ("not important") to 7 ("very important"). Table 6.36 presents the scores and ranking of the eight reasons.

Table 6.36: The Rating of the Importance of Reasons Why Sellers did not Cheat Buyers

	Average Score	Std. Dev.	6 - 7 (%)	Rank
Physical Retaliation	3.8	2.4	33.1	8
Attracting Police	4.2	2.5	40.8	6
Limited customers	5.1	2.3	61.7	4
Betrayal Police	3.9	2.4	32.5	7
Money	5.5	1.9	60.8	1
Reputation	5.3	2.2	64.7	3
Selling Stocks	5.4	2.2	64.2	2
More Crime	4.3	2.5	43.9	5

Between 61-65% of sellers thought the four reasons used in the model were very important reasons not to cheat buyers (ie. importance score of 6-7). In contrast, only between 33-44% of sellers thought the four traditional reasons were very important (ie. importance score of 6-7). When ranked according to average score of importance the four reasons used in the model were all higher than the traditional reasons. "Fear of physical retaliation" received the lowest average score of importance of the eight reasons provided (3.8). The reasons used in the model occupied the first four rankings, "money" (5.5), "selling stocks" (5.4), "reputation" (5.3), and "limited customers" (5.1). The other three traditional reasons also received relatively low scores of importance, "fear of being betrayed to the police" (3.9), "fear of attracting the police" (4.2), and "cheating may result in committing a more serious crime" (4.4).

Standard deviations were relatively high for all eight reasons reflecting the strong opposing preferences of dissenting minorities.

6.12.4 The Characteristics of Retail Cannabis Market

(x) Cannabis transactions will be regular

Most buyers (81.9%) purchased cannabis once a month or more often. The majority of buyers (58.8%) purchased cannabis once a week or more often. Some buyers (16%) purchased it on a daily basis.

(xi) Exchange parties will generally return to the same exchange partner

Only 11.4% of buyers always returned to the same buyer. More buyers (29.8%) nearly always returned to the same seller. Many others (37.5%) returned to the same seller, but also bought from other sellers. Some buyers (19.9%) only occasionally returned to the same seller.

Initially, buyers were asked why they returned to the same seller. The most popular reason to return to the same seller was the seller provided high quality cannabis (31%). The next most popular reason was the seller was trustworthy due to a close personal relationship, such as a friendship, family relationship, or flatmate (21%). Thirteen percent of buyers returned to the same seller because the seller offered good terms (ie. good price or good quantities). Only 3% of buyers returned to the same seller because they were the only seller they knew about.

The model indicated search costs would be important in the decision to return to the same seller. Three types of search cost were provided as the reason why a buyer might return to the same seller, "seller fair/honest," "difficult to find an alternative supplier," and to "reduce the risk of arrest." These reasons were contrasted with the traditional reason to return to the same seller, they provide "good quality product." Buyers scored the importance of each reason using the scale, 1 ("not important") to 7 ("very important"). Table 6.37 present the scores of importance of the reasons why buyers returned to the same seller.

Table 6.37: The Rating of the Importance of Reasons Why Buyers Returned to the Same Seller

	Average Score	Std. Dev.	6 - 7 (%)	Rank
Seller Fair	6.4	1.1	86.1	2
Difficult Find Alt. Sellers	3.0	2.0	13.0	4
Risk of Arrest	5.2	2.2	60.7	3
Quality Product	6.5	1.1	88.6	1

"Quality product" was considered to be the most important reason to return to the same seller (6.5), followed closely by one of the search costs, "seller fair/honest" (6.4). Between 86-89% of buyers thought these two reasons were very important reasons to return to the same seller (ie. importance score of 6-7). The "risk of arrest" was held to be relatively important (5.2). Just over 60% of buyers thought "risk of arrest" was a very important reason (ie. score 6-7). "Difficulties with finding an alternative seller"

was considered to be relatively unimportant (3.0). Only 13% of buyers thought it was a very important reason (ie. score 6-7). Although the traditional reason ("quality product") was held to be the most important reason to return to the same seller, two of the search costs were also held to be important.

Two reasons may explain why buyers considered "difficulties with finding an alternative seller" to be relatively unimportant. The high experience of the ALCP sample suggests many would have good knowledge of the local market. The second reason is the wording of the statement. The explanation in the brackets for the reason was ("I do not know any other cannabis sellers") (see Appendix B for copy of questionnaire). This suggested the buyer had absolutely no knowledge of other sellers, rather than it would be merely time consuming to find a new seller.

(xii) The financial value of transactions will be small, the maximum value of a retail transaction will be $500

Many buyers (37-47%) spent $25 or less per transaction. Most buyers (67-72%) spent less than $100 per transaction. Very few buyers (5-6%) spent over $500 per transaction. Four percent of buyers spent between $1000-4000 per transaction (the price of a pound), suggesting they were higher level dealers.

Initially, buyers were asked to explain why they spent the amount they did on cannabis per transaction. The most popular reason for the size of purchase was "budget constraint" (25%). The next most popular reason was "consumption limit" (14%). Only 4% of buyers indicated they purchased the amount they did to avoid greater legal penalties.

The model indicated the penalty structure of the *Misuse of Drugs Act 1975* would restrict the value of transactions. The traditional explanations for the size of purchase were "budget constraint," and "consumption limit." Buyers scored the importance of the three reasons using the scale, 1 ("not important") to 7 ("very important"). Table 6.38 presents the scores of importance of the reasons for purchasing the amount of cannabis per transaction.

Table 6.38: The Rating of the Importance of Reasons Why Buyers Spend the Amount they do on Cannabis per Transaction

	Average Score	Std. Dev.	6 - 7 (%)	Rank
Budget Constraint	4.7	2.3	47.6	1
Minimise Penalties	4.0	2.5	37.2	2
Consumption Limit	3.8	2.3	31.3	3

None of the reasons received particularly strong support. Only between 37-48% of buyers thought any of the reasons were very important (ie. importance scores of 6-7). "Legal penalties" (4.0) received good support relative to the two traditional reasons, "budget constraint" (4.7) and "consumption limit" (3.8). Buyers may have considered a combination of reasons rather one reason determined how much they spent on cannabis. When asked if there was any other reason why they spent the amount they did, 86% of buyers indicated there was no additional reason. The most popular "other reasons" provided were "cheaper to buy in bulk" followed by "budget," and "consumption level."

7. Conclusion

7.1 The Model

The model develops an economic explanation for reliable retail illicit drug exchange. Traditional explanations for reliable exchange in illicit drug markets focus on the fear of physical retaliation, or the desire to minimise the risk of arrest. The model's explanation for reliable exchange draws on economic factors such as maximising profit, retaining exchange partners, minimising search costs, and protecting local reputation. The information collected in the ALCP survey supports the primacy of economic factors above the coercive and legal consequences in the illicit market.

Development of the model has shown the importance of search costs in the application of the "ongoing interaction" solution to many situations involving voluntary cooperation. In its original form developed by Axlerod (1981; 1990), the "ongoing interaction" solution was only applicable to situations where people were certain of interacting with the same person again and again in the future. Although these conditions are met in many social situations, most notably in politics, they are unlikely to be met in many more situations. In large transient societies, individuals have the real option to stop interacting with one person and begin interacting with a new group of people. The fleeting nature of social relationships is no where more evident than in a competitive market, where exchange parties will switch exchange partners whenever performance is unacceptable or superior terms are available somewhere else. The model demonstrates the "ongoing interaction" solution can still be effective in these circumstances if the costs of switching groups, or search costs, are high enough.

7.2 The ALCP survey

The objective of the survey was to measure the level of cheating in the illicit cannabis market in New Zealand, and identify the important variables in the

decision not to cheat on transactions. The ALCP provided access to a large number of experienced cannabis buyers and sellers throughout New Zealand. The overall response rate of the questionnaire was 30% (n = 357). The information collected in the ALCP questionnaire can be used to make cautious observations about the cannabis market in New Zealand as a whole.

Two features of the ALCP survey were of concern: (i) the low response rate of the ALCP postal questionnaire (17%), and (ii) the prevention of the collection of the personal household details of respondents. Fortunately, the overall response rate of the questionnaire was improved through the canvassing efforts of Alan Webb (45%). The low response rate of the postal questionnaire appears to be the result of an out-of-date ALCP membership database, rather than in any problem with the questionnaire design. The ALCP executive requested no personal household details be collected from respondents to protect the confidentiality of its members. Although this request restricted the range of statistical analysis that could be performed on the questionnaire data, it had no effect on the testing of the model's assertions. A constructed age profile of buyers from the ALCP sample was similar to the age profile of the sample from the national survey of drug use conducted by Black and Casswell (1993) (difference between age cohorts ranges 0.2-3.5%, overall difference + 0.5%).

The characteristics of cheating in the cannabis transactions of ALCP members were broadly consistent with the assertions of the model. Product fraud, robbery, and assault, were rare, while quality fraud was relatively common. Most buyers (78.5%) had never suffered from product fraud. The overwhelming majority of buyers (91-96%) had never been robbed or assaulted. The overwhelming majority of buyers (93-100%) had experienced product fraud, robbery, and assault less than 3 times. In contrast, only 18.9% of buyers had never suffered from quality fraud. Only 35.3% of buyers had experienced quality fraud less than three times.

The overwhelming majority of buyers (84-98%) suffered from product fraud, robbery, and assault, less than 0.1 times per year on average (less than 1 time in 10 years). No buyers suffered from robbery and assault more than 0.5 times per year. Only 0.8% of buyers suffered from product fraud more than 5 times per year. In contrast, only 24.0% of buyers experienced quality fraud less than 0.1 times per year on average. Twenty-one percent of buyers (20.8%) suffered from quality fraud more than 5 times per year.

Product fraud in the ALCP sample (per 100 people) was above the range of fraud in New Zealand (per 100 people) suggesting the cannabis market is less reliable in this respect than New Zealand as a whole. There were approximately three times as many product frauds in the ALCP sample than in New Zealand as a whole. Robbery in the ALCP sample (per 100 people) was above the range of robbery in New Zealand (per 100 people) suggesting the cannabis market is less reliable in this respect than New Zealand as a whole. There were double the number of robberies in the ALCP sample than in New Zealand as a whole. Assault in the ALCP sample (per 100 people) was below the range of assault in New Zealand (per 100 people) suggesting the cannabis market is more reliable in this respect than New Zealand as a whole. There were one third less assaults in the ALCP sample than in New Zealand as a whole. Quality fraud in the ALCP sample (per 100 people) was well above the range of fraud in New Zealand (per 100 people) suggesting the cannabis market is very unreliable in this respect compared to New Zealand as a whole. There were approximately 100 times more incidents of quality fraud in the ALCP sample than in New Zealand as a whole.

A large proportion of buyers (84-98%) had levels of product fraud, robbery, and assault (per 100 people) within or below the range of these offences (per 100 people) for New Zealand. This is predominantly because a large proportion of buyers (79-96%) had never suffered from product fraud, robbery, and assault.

Only a very small proportion of buyers (2-16%) had levels of product fraud, robbery, and assault (per 100 people), above the range of these offences (per 100 people) for New Zealand. In contrast, only 21.0% of buyers had levels of quality fraud (per 100 people) within or below the range of fraud (per 100 people) for New Zealand. Over three-quarters of buyers (79%) had levels of quality fraud (per 100 people) above the levels of fraud (per 100 people) for New Zealand as a whole.

Between 85-98% of buyers experienced product fraud, robbery, and assault, less than 0.1 times per 100 transactions (less than 1 time in 1000 transactions). Only 4% of buyers experienced product fraud more than 5 times in 100 transactions. Only 0.8% of buyers (2 people) experienced robbery more than 5 times in 100 transactions. No one experienced assault more than 5 times in 100 transactions. In contrast, only 21% of buyers experienced quality fraud less than 0.1 times in 100 transactions. Forty-one percent of buyers experienced quality fraud more than 5 times in 100 transactions.

Most buyers (66-80%) responded to the different types of cheating by either doing "nothing" or "changing their supplier." Only a small minority of buyers (3-15%) responded with violence. The exception was assault, where many victims (60%) reported "fighting back."

When asked to compare the reliability of cannabis transactions with legal transactions, most buyers (67%) thought cannabis transactions were about the same, or only slightly less safe and reliable, than legal transactions. A few buyers (14%) thought cannabis transactions were actually more safe and reliable than legal transactions. Very few buyers (6.2%) thought cannabis transactions were very unsafe.

Sellers thought the economic explanations for reliable illicit drug exchange based on the profit motive and the need to minimise search costs, were more important than the traditional explanations for reliable exchange based on fear of physical retaliation and the desire to avoid arrest. Between 61-65% of sellers thought the four reasons used in the model were very important reasons not to cheat buyers (ie. importance score of 6-7). In contrast, only between 33-44% of sellers thought the four traditional reasons were very important (ie. importance score of 6-7). When ranked according to average score of importance the four reasons used in the model were all higher than the traditional reasons. The reasons used in the model occupied the first four rankings, "money" (5.5), "selling stocks" (5.4), "reputation" (5.3), and "limited customers" (5.1). "Fear of physical retaliation" received the lowest average score of importance of the eight reasons provided (3.8). The other three traditional reasons also received relatively low average scores of importance, "fear of being betrayed to the police" (3.9), "fear of attracting the police" (4.2), and "cheating may result in committing a more serious crime" (4.4). Standard deviations were relatively high for all eight reasons reflecting the strong opposing preferences of dissenting minorities.

Cannabis transactions were regular. Most buyers (81.9%) purchased cannabis once a month or more often. The majority of buyers (58.8%) purchased cannabis once a week or more often. Some buyers (16%) purchased it on a daily basis.

The financial value of cannabis transactions were small, only a small minority spent over $500 per transaction (ie. the limit set by the *Misuse of Drugs Act 1975*). Many buyers (37-47%) spent $25 or less per transaction. Most buyers (67-72%) spent less than $100 per transaction. Very few buyers (5-6%) spent over $500 per transaction. Four percent of buyers spent between $1000-4000 per transaction (the price of a pound), suggesting they were higher level dealers.

However, some answers were not broadly consistent with the models assertions. Although many buyers practiced exclusive exchange relationships, many others did not. Only 11.4% of buyers always returned to the same buyer. More buyers (29.8%) nearly always returned to the same seller. Many others (37.5%) returned to the same seller, but also bought from other sellers. Some buyers (19.9%) only occasionally returned to the same seller.

Although two of the search costs were held to be important in the decision to return to the same seller (ie "seller fair/honest (6.4), "risk of arrest" (5.2)), the third search cost, "difficulties with finding an alternative seller," was considered to be relatively unimportant (3.0). Only 13% of buyers thought it was very important (ie. score of 6-7). Two reasons may explain why buyers considered "difficulties with finding an alternative seller" to be relatively unimportant. The experience of the ALCP sample suggests many would have good knowledge of the local market and therefore would have little difficulty finding alternative sellers. The second reason is the poor wording of the statement. The explanation in the brackets for the reason was ("I do not know any other cannabis sellers") (see Appendix B for copy of questionnaire). This suggested the buyer had absolutely no knowledge of other sellers, rather than it would be merely time consuming to find a new seller.

The response to the question on the amount buyers spent on cannabis per transaction was not strong. None of the reasons provided to explain the amount buyers spent per transaction on cannabis received particularly strong support. Only between 37-48% of buyers thought any of the reasons were very important (ie. importance scores of 6-7). When asked if there was any other reason why they spent the amount they did, 86% of buyers indicated there was no additional reason. The most popular "other reasons" provided were "cheaper to buy in bulk" followed by "budget," and "consumption level." Buyers may have considered a combination of reasons, rather one reason, determined how much they spent on

cannabis per transaction. The constraint identified in the model as influencing the size of transactions, "legal penalties," received a high average score of importance (4.0) relative to the two traditional reasons for transaction size, "budget constraint" (4.0) and "consumption limit" (3.8).

7.3 Policy Implications

One of the objectives of this thesis was to assist policy makers with developing drug control policy. The level of violence and cheating in illicit drug markets defines the magnitude of the social benefits from legalizing and regulating the illicit market. A reliable illicit drugs market would also make decriminalisation a more attractive policy option.

The scope of this thesis only partly addresses these policy issues. The model does not explain all the cheating and violence which might occur in an illicit drugs market. It only investigates the incentives to cheat faced by exchange parties during retail transactions. It does not investigate the incentives to cheat on wholesale transactions. The model does not investigate the violence which may occur between sellers seeking greater market share. It also does not investigate the incentives third parties might have to victimise exchange parties. Finally, it does not address the violence associated with defending stocks of drugs or drug production sites from third parties.

There is also the broader issue of how much violence legalization would eliminate. Opponents of legalization have pointed out the possibility of the survival of an illicit market if taxation and regulation are too strict (Keilman and Saiger, 1990; Jacobs, 1990). Violent criminals may simply find a new illicit industry to operate within. There is also the issue of how the increase in drug consumption following any liberalisation of drug laws would contribute to violence in society (Wilson, 1990; Inciardi and Saum, 1996).

The policy implications which can be drawn from this thesis are therefore extremely tentative. They are subject to more comprehensive research of violence in illicit markets, and greater understanding of the wider consequences of liberalising drug control laws. The analysis and evidence in this thesis suggests the legalization and regulation of the cannabis market will only have a small impact on lowering violence and cheating in New Zealand society. The only significant impact the legalization of cannabis would have on levels of victimisation would be to reduce quality fraud. Given the widespread disapproval of cannabis use, this is likely to viewed as an improvement of dubious social value.

The results from this thesis could be used to support the case for the decriminalisation of cannabis in New Zealand. The thesis suggests the illicit cannabis market does not contribute significantly to violence and victimisation in New Zealand. Decriminalisation could be used to meet any public demand for the reduction in the legal penalties for cannabis use without concern about leaving a dangerous illicit market intact. An advantage of forcing consumers to buy cannabis through an illicit market is the price would remain high, and access to sellers would remain time consuming and risky, which would all serve to contain demand. A disadvantage with decriminalisation is the reduction in legal penalties for cannabis use may lead to an expansion in cannabis use, which may not be socially desirable. An important issue with the social impact of expanded cannabis use would be whether users would substitute legal drugs (eg. alcohol, tobacco) for cannabis, or merely combine cannabis use with existing legal drugs. The persistence of the illicit market for cannabis would also continue to finance organised criminal groups. Finally, there is the wider issue of whether decriminalisation would be a political "slippery slope" to even greater liberalisation of the drug - eventually leading to outright legalization. Evidence from the alcohol market suggests there is ongoing lobbying of politicians by industry groups to reduce restrictions on regulated products (see Casswell and Abel, 1993).

7.4 Theory Development

This thesis contributes to the theoretical understanding of cooperation in the absence of third party enforcement, or voluntary cooperation. Illicit drug transactions are widely assumed to be unreliable because exchange parties cannot use the police and courts to enforce the terms of transactions. The prisoners dilemma game suggests greed and mistrust will prevent self interested individuals from cooperating without third party enforcement.

In recent years, economists have identified a range of social institutions which facilitate voluntary cooperation. For a situation to be plausibly modelled as a prisoners dilemma game two key assumptions must hold: (i) players are not permitted to communicate with each other before deciding what to do, (ii) players choose only once before deciding what to do. Investigation of real world examples of voluntary cooperation have found social institutions which modify one or both of the key assumptions. These include, informal third party enforcement, credible retaliation, compensation and arbitration, ongoing interaction, social conditioning, cross-cutting allegiances, dense social interaction, and conditional cooperation. Many of these social institutions are present in a stable form of stateless exchange known as "personal exchange" (see North, 1984; 1987; 1989; 1990).

The reliability of retail illicit drug transactions presents a greater challenge than exchange within personalised economies. Many of the institutions of "personal exchange" are missing from the retail illicit drugs market. Illicit drug transactions are often conducted between complete strangers living in impersonal urban communities. The seller is a profit motivated opportunist (ie. a career criminal), and the buyer often a desperate addict. It is difficult to measure the value of illicit drugs before a transaction is complete. The possibility exchange might involve

ongoing transactions between the same two exchange parties offered the most promising mechanism to encourage reliable exchange.

The problem with the application of the "ongoing interaction" solution to illicit drugs markets is cheating exchange parties are able to switch exchange partners. They can avoid the punishment for cheating (ie. future non-cooperation) by transacting with a new exchange partner. The introduction of transaction costs to the problem indicates exchange parties cannot costlessly enter new exchange relationships. The transactions costs, or more precisely the search costs, incurred finding a new exchange partner after cheating establish a cost, or punishment, for cheating. High search costs encourage exchange parties to voluntarily honour the terms of transactions. High search costs can be viewed as an additional social mechanism to encourage voluntary cooperation.

Search costs are a neglected topic in property rights economics. This is partly because of a lack of a precise definition of transaction costs (ie. the existence of search costs as a component of transaction costs is often not made theoretically explicit), and partly because the type of economies that have been studied (ie. advanced market institutions, such as advertising, conceal the problem of search). This thesis has made a small contribution to re-introducing search costs into the property rights research agenda. The study of the individual components of transaction costs has lead to important extensions to the property rights approach. For example, North's focus on the cost of enforcing property rights lead him to a theory of ideology, which he recently used in his explanation of path dependant institutional change (see North 1981; 1990). The study of search costs may well yield similar theoretical progress.

7.5 Future Research

Illicit drug markets offer a number of opportunities for further economic modelling. The role violence plays in competition between sellers in illicit drug markets remains unexplored. Similarly, the ability of third parties to victimise exchange parties in illicit drug markets is an important factor in the reliability of the market.

The model developed in this thesis could also be applied to other illicit drug markets in different countries. The market survey work presented in the thesis is obviously specific to cannabis, and to New Zealand. It might be argued the cannabis market is likely to be a relatively benign illicit market because cannabis is a cheap and low potency drug. Illicit markets for more potent and lucrative drugs, such as 'crack' cocaine and heroin, may still turn out to be very unreliable. There may also be doubts whether the level of criminality in New Zealand is comparable with the level of criminality in large scale urban environments, such as New York City.

The relationship established with the ALCP executive would be useful for further cannabis research in New Zealand. The ALCP is a national organisation with a membership database of over 700 people. The questionnaire indicates members are highly experienced cannabis users and participants in the New Zealand cannabis market. The level of cooperation achieved with the ALCP executive will only increase with each successful project. Future researchers can reasonably expect greater concessions over confidentiality issues.

Appendix

Appendix A: Ministry of Justice Statistics

Table (i): Number of Cases Involving Drug Offences Resulting in Each Type of Sentence, 1986-1995

Sentence Type	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Custodial	449	567	537	516	554	532	561	520	593	490
Periodic Detention	983	1274	1276	1284	1501	1634	1706	2014	1894	1449
Community Programme	73	73	39	32	28	52	43	42	38	31
Community Service	222	204	230	297	308	580	707	787	823	583
Supervision	262	301	225	229	167	166	190	261	281	260
Monetary	6394	6047	5799	4707	4062	3737	3136	3957	4129	3457
Deferment	109	160	140	123	97	148	179	202	178	186
Other	1	0	1	1	0	0	1	0	0	0
Conviction & Discharge	65	129	113	66	61	81	129	166	205	170
Total	8558	8755	8360	7255	6778	6930	6652	7949	8141	6626

Table (ii): Number of Cases Involving Each Drug Offence, 1986-1995

Offence	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Use Cannabis	6008	5811	5070	4301	3630	3584	3091	3894	3801	2929
Deal in Cannabis	1605	1836	2068	1896	2173	2310	2496	2783	2989	2462
Other Cannabis	419	482	673	544	491	558	585	800	865	728
Use Other Drug	256	284	224	234	190	194	164	188	192	213
Deal in Other Drug	99	123	131	136	190	196	211	193	200	203
Other Drug	171	219	194	144	100	86	101	91	94	91

Appendix B: The ALCP Questionnaire

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Te Whare Wānanga o Waikato

Cannabis Market Questionnaire

This questionnaire is part of my doctoral thesis for the Economics Department at the University of Waikato. My topic is violence in the illicit cannabis market. I would like you to fill out this questionnaire if you have bought or sold cannabis in New Zealand in the last five years. It should only take you about **FIVE MINUTES** to complete. An envelope is provided to return your completed questionnaire. If you have not bought or sold cannabis in this time, please tick the box below which best describes you, and return the uncompleted questionnaire in the envelope provided.

☐ I do not use cannabis

☐ I do use cannabis, but neither buy nor sell it

The questionnaire is completely anonymous and only aggregate data will be published. The completed questionnaires will be securely stored in the Economics Department while the study is underway, and will be destroyed when the study is completed. Only I will process the completed questionnaires.

It is important that I receive as many completed questionnaires as possible, so as to gain the fullest understanding of the conditions in the illicit cannabis market. However, participation in the study is not compulsory, and you are free to choose not to respond to any particular question/s. Please fill out only one questionnaire.

Chris Wilkins
Department of Economics
e-mail wilkins@waikato.ac.nz

Section A: The Cannabis Market

1. **How much do you normally pay for a "bullet" (one gram) of cannabis?** - ($)

2. **How much do you normally pay for an ounce (28 grams) of cannabis?** - ($)

3. **How would you describe your involvement in the cannabis market?** (Please tick one only)

   ☐ I only buy cannabis **(Only answer SECTION B)**
   ☐ I only sell cannabis **(Only answer SECTION C)**
   ☐ I buy and sell cannabis **(Please answer BOTH SECTION B and C)**

Section B: Buying Cannabis

1. **How often do you normally BUY cannabis** (Please tick one only)

☐ Daily ☐ Twice a week ☐ Once a week ☐ Fortnightly ☐ Monthly
☐ Every 3 months ☐ Every 6 months ☐ Once a year

2. **Approximately how long have you been BUYING cannabis?** (Please enter the number of years in the box) ..... ☐

3. **Approximately how many times has the cannabis you received been of a lower quality than you paid for?** (Please enter your best estimate of the number of times in the box) ..... ☐

3a. **What did you do about it?** (Please answer in the space below)

.....
.....
.....

4. **Approximately how many times have you paid for cannabis but received a fraudulent substance in return?** (Please enter your best estimate of the number of times in the box) ..... ☐

4a. **What did you do about it?** (Please answer in the space below)

.....

10. Using the scale below, please indicate how important each factor is in your decision to return to the same cannabis seller?
(Please write the number in each of the boxes)

Not important 1 2 3 4 5 6 7 Very important

☐ Seller fair/honest (ie. s/he does not rip me off)

☐ Difficult to find an alternative supplier (ie. I do not know any other cannabis sellers)

☐ Reduce the risk of arrest (ie. I am worried about buying from an undercover police officer)

☐ Seller provides good quality product

☐ Other reason (Please state).....

11. How much do you normally spend on cannabis per transaction? ($)

11a. Why do you spend this amount? (Please answer in space below)

.....

.....

.....

12. Using the scale below, please indicate how important each factor is in your decision to spend this amount per transaction
(Please write the number in each of the boxes)

Not important 1 2 3 4 5 6 7 Very important

☐ Budget constraint (ie. that's all the money I have to spend on cannabis)

☐ Minimise penalties if caught (ie. I do not want to be caught with a large amount of cannabis)

☐ My consumption limit (ie. that's all the cannabis I want to consume at any given time)

☐ Other reason (Please state).....

If you only buy cannabis, please end here, If you also sell cannabis, please continue with Section C (p.t.o)

5. **Approximately how many times have you been robbed of your money during a cannabis transaction?** (Please enter your best estimate of the number of times in the box) ..... ☐

5a. **What did you do about it?** (Please answer in the space below)

.....

.....

6. **Approximately how many times have you been physically assaulted while carrying out a cannabis transaction?** (Please enter your best estimate of the number of times in the box) ..... ☐

6a. **What did you do about it?** (Please answer in the space below)

.....

.....

.....

7. **In comparison to your purchases of legal goods, how safe and reliable do you consider cannabis transactions?** (Please tick one only)

- ☐ Very unsafe and unreliable
- ☐ Pretty unsafe and unreliable
- ☐ Slightly less safe and reliable than legal transactions
- ☐ About the same as legal transactions
- ☐ More safe and reliable than legal transactions

8. **Which of the following statements <u>BEST</u> describes the way you buy cannabis?** (Please tick one only)

- ☐ I buy from different sellers, rarely returning to the same one more than once
- ☐ I buy from different sellers, occasionally I return to the same ones
- ☐ Many of my purchases are from the same seller, but I also buy from several other sellers
- ☐ I nearly always return to the same seller, I only occasionally buy from any other sellers
- ☐ I always buy from the same seller

9. **Why do you return to the same seller?** (Please answer in space below)

.....

.....

.....

Section C: Selling Cannabis

1. **What stops you from cheating on a cannabis transaction?** (ie. selling low quality cannabis at a high quality price, selling fraudulent substances, robbing buyers)
(Please answer in space below)

.....
.....
.....

2. **Using the scale below, please indicate how important each factor is in your decision NOT to cheat on a cannabis transaction**

Not important 1 2 3 4 5 6 7 Very important

☐ fear of physical retaliation (ie. the person I cheat may hurt me or my property)

☐ fear of attracting the police (ie. cheating could attract the attention of police or neighbours)

☐ have only a limited number of people to sell to (ie. if I cheat customers they will not come back)

☐ fear of being betrayed to the police (ie. the person I cheat may report me to the police)

☐ happy with the money I receive from selling cannabis (ie. selling is profitable enough, there is no need to cheat)

☐ worried about my reputation in the cannabis marketplace (ie. if people know I cheat it will be difficult to hold on to existing customers and attract new ones)

☐ by not cheating I am able to sell my stocks of cannabis quickly and thereby reduce the chance of being caught with large amounts of cannabis (ie.I can reduce the chances of being charged as a dealer)

☐ cheating may result in committing a more serious crime (ie. committing an assault to rob a customer is a much more serious crime than just dealing in cannabis)

☐ Other reason (Please state).....

Thanks for your help with this survey.

Appendix C: The ALCP Mailout

1. Introduction

The proposal made to the ALCP executive was they would include the questionnaire, with a return envelope, in their next mailout. In return, the Economics Department would pay the postal cost of the mailout. Postal delivery of the questionnaire would ensure the safety of researchers and research subjects by removing the need for personal contact. The ALCP agreed to include a brief message endorsing the survey. The questionnaires would be sent directly to the ALCP executive who would post them to members with the mailout information. This would ensure the names and addresses of members would remain confidential. This proposal was accepted by the ALCP executive on the 3rd of February 1998. The ALCP estimated they could distribute roughly 800 questionnaires. The project obtained funding for 1000 questionnaires.

2. Confidentiality

The ALCP executive expressed concern about the personal household details that were to be collected as part of the questionnaire. The questionnaire not only asked ALCP members to provide information on the purchase and sale of illicit substances, but also potentially on more serious crimes, such as assault and robbery. Since including the questionnaire with ALCP material amounted to endorsing it to members, the executive wanted all possibly steps taken to protect members from legal investigation or personal embarrassment. It was therefore agreed to remove the household section from the questionnaire.

The removal of the household section has implications for the statistical analysis of the questionnaire, and for the type of analysis that can be performed on the questionnaire. Without the household details of respondents it is impossible to know how

representative the ALCP sample is of all cannabis buyers and sellers in New Zealand. This means the information collected in the questionnaire cannot be used to make statistical inferences about the cannabis market as a whole. The absence of household details also prevents the analysis of the data collected with respect to respondents personal details. It is not possible, for example, to compare the transactions of male cannabis buyers with those of female cannabis buyers.

These limitations are acceptable given the objectives of the survey, and the nature of previous research. The selective nature of the ALCP sample meant the information collected was already unlikely to be suitable to make statistically inferences. In previous studies of illicit drug markets, sample selectivity was considered acceptable if the results were interpreted with care (Reuter et al, 1990; Reuter and Haaga, 1989). The personal details of buyers and sellers were not used as variables in the model, and were not part of the assertions developed from the model. Although the analysis of data with respect to demographic details would have been interesting, it was not central to the study. On the positive side, the absence of a household section may have improved the response rate of the survey, and candour of subjects.

Appendix D: The Canvassing of Alan Webb

Following the ALCP mailout, the project was approached by Alan Webb, the ALCP's regional representative for the central North Island. He offered to personally distribute additional questionnaires in the Hawkes Bay area where he lived. He indicated he had many contacts in the local cannabis community, and was happy to canvas the centre centres and local bars of the area, including the local polytech. Alan Webb's description of his canvassing techniques is reproduced below.

613c Queen St. w
Hastings
20/05/98

to Chris Wilkins
Economics Dept.
Waikato University

Chris,

An account of my methods of extracting responses to your questionnaire.

Many of the responses were solicited from people that I know definitely either smoke now or have recently stopped. This was done by either, chance meetings in the street or hotel, or I went to visit them at home. The latter includes most of the people I have bought from in the past.

My position in the ALCP demands that I promote myself as an anti prohibition campaigner. To this end, I am "world famous in Hastings". Whilst your questionnaire is not an ALCP initiative it did give me an excellent opportunity to get out into the public and do the anti prohibition boogie. Thank you. I sought permission from the Hastings District and Napier City councils to "carry out an activity" in the main streets of the two cities. I put in one afternoon and two evenings in Napier and estimate the total number or responses to be 65-75. Hastings inner city mall is more convenient for me and so the number of responses is far greater. I spent approx. 25-30 hours in the mall. I estimate the number of responses at 150-175. Lots of these respondents filled in the form on the spot which I then put into the envelope provided. Many took the form and envelope home for either themselves or a friend or partner.

There are several bars in Hastings where I am welcome to peddle my wares. I gave these bars a bit of a hiding and except for thiryfive, they are where I got the rest of the responses. Fifteen went to EIT Student Association. Twenty were distributed to the members of the local branch of the ALCP.

When approaching strangers, I have always employed a simple set of rules.
1. Always be courteous. (in case the person is a prohibitionist.)
2. To lessen the chance of rejection, assess the attitude of the subject by taking note of clothing,
hairstyle and body language.

On Friday the fifth of July, the HB branch is to have their AGM. This is to be the last time I will gather responses. I will post all the responses that I am holding on the Monday following the fifth. I know we did say that the end of the month was to be the cutoff point but this is a good opportunity to reach some people that I have missed.

I hope this is what you wanted Chris, phone me if you need more.

Thank you,

Allan G Webb.

Appendix E: Data and Residuals

Section A: The Cannabis Market

Three hundred and two people were eligible to complete Section A.

A1. How much do you normally pay for a "bullet" (one gram) of cannabis ?

Table A1: Bullet Prices

Value($)	Frequency	Percent	Valid Percent	Cum Percent
5	2	0.7	0.7	0.7
10	2	0.7	0.7	1.5
15	2	0.7	0.7	2.2
20	242	80.1	90.0	92.2
25	20	6.6	7.4	99.6
60	1	0.3	0.4	100.0
Incomplete	1	0.3		
Not Applicable	14	4.6		
Missing	18	6.0		
Total	302	100.0	100.0	

Mean 20.30 Std dev 3.22

Fourteen people (4.6%) indicated the question was "not applicable" to them because they did not buy cannabis in such small quantities, preferring instead to buy in ounces. An unknown number of the people who did not answer the question (6%) may also have been in this situation.

A2. How much do you normally pay for an ounce (28 grams) of cannabis ?

Table A2(i): Ounce Prices (low values)

Value($)	Frequency	Percent	Valid Percent	Cum Percent
90	1	0.3	0.4	0.4
100	2	0.7	0.8	1.1
150	6	2.0	2.3	3.4
180	3	1.0	1.1	4.6
190	1	0.3	0.4	5.0
200	47	15.6	17.9	22.9
225	1	0.3	0.4	23.3
230	1	0.3	0.4	23.7
240	1	0.3	0.4	24.0
250	111	36.8	42.4	66.4
270	2	0.7	0.8	67.2
280	7	2.3	2.7	69.8
300	52	17.2	19.8	89.7
320	2	0.7	0.8	90.5
350	17	5.6	6.5	96.9
400	4	1.3	1.5	98.5
450	3	1.0	1.1	99.6
500	1	0.3	0.4	100.0
Incomplete	2	0.7		
Not Applicable	8	2.6		
Missing	30	9.9		
Total	302	100.0	100.0	

Mean 259.18 Std dev 56.56

Table A2(ii): Ounce Prices (high values)

Value($)	Frequency	Percent	Valid Percent	Cum Percent
90	1	0.3	0.4	0.4
100	1	0.3	0.4	0.8
150	4	1.30	1.5	2.3
180	1	0.3	0.4	2.7
200	26	8.6	9.9	12.6
220	2	0.7	0.8	13.4
225	1	0.3	0.4	13.7
230	1	0.3	0.4	14.1
240	1	0.3	0.4	14.5
250	90	29.8	34.4	48.9
270	1	0.3	0.4	49.2
280	9	3.0	3.4	52.7
300	66	21.9	25.2	77.9
320	3	1.0	1.1	79.0
350	34	11.3	13.0	92.0
400	11	3.6	4.2	96.2
450	6	2.0	2.3	98.5
500	4	1.3	1.5	100.0
Incomplete	2	0.7		
Not Applicable	8	2.6		
Missing	30	9.9		
Total	302	100.0	100.0	

Mean 283.80 Std dev 65.72

The answers to the question are summarised in Table A2(i) and A2(ii). The question was "not applicable" to a small number of people (2.6%) because they bought their cannabis in bullets rather than in ounces. An unknown number of those who did not answer the question (9.9%) may also have been in this situation.

Section B: Buying Cannabis

Two hundred and ninety people were eligible to complete Section B.

B1. How often do you normally buy cannabis ?

Table B1: How Often Cannabis is Purchased

	Frequency	Percent	Valid Percent	Cum. Percent
Daily	44	15.2	15.9	15.9
Twice a week	57	19.7	20.6	36.5
Once a week	62	21.4	22.4	58.8
Fortnightly	30	10.3	10.8	69.7
Monthly	34	11.7	12.3	81.9
Every 3 months	20	6.9	7.2	89.2
Every 6 months	14	4.8	5.1	94.2
Once a year	16	5.5	5.8	100.0
Incomplete	9	3.1		
Missing	4	1.4		
Total	290	100.0	100.0	

Mean 3.5 Std dev 2.0

B2. Approximately how long have you been buying cannabis ?

Table B2: Years Cannabis Purchased

Years	Frequency	Percent	Valid Percent	Cum Percent
1-5	87	30.0	31.0	31.0
6-10	73	25.2	25.9	56.9
11-15	39	13.4	13.9	70.8
16-20	46	15.9	16.4	87.2
21-25	20	6.9	7.1	94.3
26-30	15	5.2	5.3	99.6
31-35	1	0.3	0.4	100.0
Incomplete	8	2.8		
Missing	1	0.3		
Total	290	100.0	100.0	

Mean 11.4 Std Dev. 7.8

Buyers were asked to write the number of years they had been buying cannabis. The results are summarised in Table B2. There were a number of "incomplete" answers because some people wrote broad word answers (eg. for "ages") instead of a number of years. People may have answered in this way because they could not recall the exact number of years they had been buying cannabis.

Table B2a: Number of Transactions Completed

Transactions	Frequency	Percent	Cum Percent
1-50	45	16.5	16.5
51-100	21	7.7	24.2
101-300	62	22.7	46.9
301-1000	74	27.1	74.0
1001-2000	32	11.7	85.7
2001-3000	18	6.6	92.3
3001-4000	3	1.1	93.4
4001-5000	5	1.8	95.2
5001-6000	4	1.5	96.7
6001-7000	2	0.7	97.4
7001-8000	5	1.9	99.3
8001-9000	1	0.3	99.6
9001-10000	1	0.3	100.0
Total	273	100.0	

Mean 952.8 Std Dev. 1602.9

B3. Approximately how many times has the cannabis you received been of a lower quality than you paid for ?

Table B3: Incidence of Quality Fraud

Times	Frequency	Percent	Valid Percent	Cum Percent
None	45	15.5	18.9	18.9
1-2	39	13.5	16.4	35.3
3-5	36	12.4	15.1	50.4
6-10	30	10.3	12.6	63.0
11-20	24	8.3	10.1	73.1
21-50	22	7.6	9.3	82.4
51-100	14	4.8	5.8	88.2
101-500	19	6.6	8.0	96.2
501-1000	5	1.7	2.1	98.3
>1000	4	1.4	1.7	100.0
Incomplete	41	14.1		
Missing	11	3.8		
Total	290	100.0	100.0	

Mean 87.2 Std. Dev. 336

There were a number of "incomplete" answers because some people wrote broad word answers (eg. "often", "quite a few times") instead of a number. People are likely to have answered in this way because they could not recall the exact number of times they had suffered from quality fraud.

Table B3(i): Average Incidence of Quality Fraud per Year

Percent	Frequency	Percent	Cum Percent
zero	45	19.3	19.3
<0.1	11	4.7	24.0
0.1-0.5	53	22.7	46.7
0.51-0.9	23	9.8	56.5
1.0-5.0	53	22.7	79.2
5.1-10.0	16	6.8	86
10.1-15.0	7	3.0	89
15.1-20.0	2	0.8	89.8
20-30	7	3.0	92.8
>30	16	6.8	100
Total	233	100	

Mean 6.94 Std dev 16.10

Table B3(ii): Quality Fraud as Percentage of Transactions

Percent	Frequency	Percent	Cum Percent
zero	44	18.9	18.9
<1.0	48	20.6	39.5
1.0-5.0	46	19.7	59.2
5.1-10.0	24	10.3	69.5
10.1-20.0	17	7.3	76.8
20.1-30.0	16	6.9	83.7
30.1-40.0	12	5.1	88.8
40.1-50.0	19	8.2	97
>50.0	7	3	100
Total	233	100	

Mean 12.1% Std Dev. 18.1%

B4. Approximately how many times have you paid for cannabis but received a fraudulent substance in return ?

Table B4: Incidence of Product Fraud

Times	Frequency	Percent	Valid Percent	Cum Percent
None	212	73.1	78.5	78.5
1-2	38	13.1	14.1	92.6
3-5	6	2.1	2.2	94.8
6-10	6	2.0	2.2	97.0
11-20	5	1.8	1.9	98.9
>20	3	1.0	1.1	100.0
Incomplete	14	4.8		
Missing	6	2.1		
Total	290	100.0	100.0	

Mean 1.4 Std Dev. 7.2

There were a relatively high number of incomplete answers because some people answered with broad word answers rather than a number. Again, this may reflect the difficulties buyers had with estimating the exact number of incidents.

Table B4(i): Average Incidence of Product Fraud per Year

Percent	Frequency	Percent	Cum Percent
zero	208	79.4	79.4
<0.1	13	4.9	84.3
0.1-0.5	30	11.4	95.7
0.6-0.9	3	1.2	96.9
1.0-5.0	6	2.3	99.1
>5.0	2	0.8	100
Total	262	100	

Mean 0.23 Std dev 1.68

Table B4(ii): Product Fraud as a Percentage of Transactions

Percent	Frequency	Percent	Cum Percent
zero	205	79.2	79.2
<0.1	16	6.1	85.3
0.1-1.0	20	7.8	93.1
1.1-5.0	7	2.7	95.8
5.1-10.0	4	1.5	97.3
10.1-20.0	3	1.2	98.5
>20.0	4	1.5	100
Total	259	100	

Mean 1.0% Std Dev. 5.8%

B5. Approximately how many times have you been robbed of your money during a cannabis transaction ?

Table B5: Incidence of Robbery

Times	Frequency	Percent	Valid Percent	Cum Percent
None	249	85.9	90.5	90.5
1-2	18	6.2	6.6	97.1
3-5	6	2.1	2.2	99.3
6-10	2	0.6	0.7	100.0
Incomplete	1	0.3		.
Missing	14	4.8		
Total	290	100.0	100.0	

Mean .02 Std Dev. .1

A relatively high number of buyers did not answer the question (ie. "missings"). Given the high number of buyers who had never been robbed, one possible explanantion for the increase in the number of people who did not answer the question is these missing people had also never been robbed and consequently believed the question was not relevant to them.

Table B5(i): Average Incidence of Robbery per Year

Percent	Frequency	Percent	Cum Percent
zero	243	90.7	90.7
<0.1	8	3	93.7
0.1-0.5	17	6.3	100
0.6-1.0	0	0	
Total	268	100	

Mean 0.19 Std dev 0.074

Table B5(ii): Robbery as a Percentage of Transactions

Percent	Frequency	Percent	Cum Percent
zero	238	91.2	91.2
<0.1	6	2.3	93.5
0.1-1.0	13	5.0	98.5
1.1-5.0	2	0.7	99.2
>5.0	2	0.8	100.0
Total	261	100.0	

Mean .16% Std Dev. 1.3%

B6. Approximately how many times have you been physically assaulted while carrying out a cannabis transaction ?

Table B6: Incidence of Assault

Times	Frequency	Percent	Valid Percent	Cum Percent
None	266	91.7	96.4	96.4
1-2	9	3.1	3.2	99.6
>2	1	0.4	0.4	100.0
Missing	14	4.8		
Total	290	100.0	100.0	

Mean .1 Std Dev. .6

As was noted in the previous question it could be argued that many of those who did not answer the question (ie. "missing") may never have been assaulted.

Table B6(i): Average Incidence of Assault per Year

Percent	Frequency	Percent	Cum Percent
zero	260	96.2	96.2
<0.1	5	1.9	98.3
0.1-0.5	5	1.9	100
0.6-1.0	0	0	
Total	270	100	

Mean 0.005 Std dev 0.032

Table B6(ii): Assault as a Percentage of Transactions

Percent	Frequency	Percent	Cum Percent
zero	253	96.2	96.2
<0.1	4	1.5	97.7
0.1-1.0	4	1.5	99.2
>1.0	2	0.8	100.0
Total	263	100.0	

Mean .02% Std Dev. 1.4%

B7. In comparison to your purchases of legal goods, how safe and reliable do you consider cannabis transactions ?

Table B7: Perceptions of the Reliability of Cannabis Transactions

	Frequency	Percent	Valid Percent	Cum Percent
Very unsafe	17	5.9	6.2	6.2
Pretty unsafe	36	12.4	13.2	19.4
Slightly less safe	100	34.5	36.6	56.0
About the same	83	28.6	30.4	86.4
More safe	37	12.8	13.6	100.0
Missing	17	5.9		
Total	290	100.0	100.0	

Mean 3.3 Std Dev. 1.1

B8. Which of the following statements best describes the way you buy cannabis ?

Table B8: The Way Cannabis is Purchased

	Frequency	Percent	Valid Percent	Cum Percent
Rarely return	4	1.4	1.5	6.2
Occaisonally return	54	18.6	19.9	19.4
Also buy from others	102	35.2	37.5	56.0
Nearly always return	81	27.9	29.8	86.4
Always return	31	10.7	11.4	100.0
Incomplete	1	0.3		
Missing	17	5.9		
Total	290	100.0	100.0	

Mean 3.3 Std Dev. 1.0

B10. Using the scale below, please indicate how important each factor is in your decision to return to the same cannabis seller ?

A number of buyers misunderstood the instructions of the question, instead of scoring each of the reasons using the scale, they followed the instructions of previous questions and ticked one option and left the others blank. Ticks were coded as "incomplete," while empty boxes were coded as "missing." As a consequence there was a relatively high number of "incompletes" and "missings" for this question. The majority of people were able to follow the instructions and complete the question correctly.

Table B10(i): The Importance of Fairness

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	4	1.4	1.7	1.7
2	2	0.7	0.8	2.5
3	4	1.4	1.7	4.2
4	4	1.4	1.7	5.9
5	19	6.6	8.0	13.9
6	43	14.8	18.1	32.1
Very important	161	55.5	67.9	100.0
Incomplete	23	7.9		
Missing	30	10.3		
Total	290	100.0	100.0	

Table B10(ii): The Importance of Finding Alternative Sellers

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	79	27.2	34.2	34.2
2	33	11.4	14.3	48.5
3	33	11.4	14.3	62.8
4	35	12.1	15.2	77.9
5	21	7.2	9.1	87.0
6	10	3.4	4.3	91.3
Very important	20	6.9	8.7	100.0
Incomplete	7	2.4		
Missing	52	17.9		
Total	290	100.0	100.0	

Table B10(iii): The Importance of Avoiding Arrest

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	31	10.7	13.2	13.2
2	15	5.2	6.4	19.7
3	10	3.4	4.3	23.9
4	19	6.6	8.1	32.1
5	17	5.9	7.3	39.3
6	27	9.3	11.5	50.9
Very important	115	39.7	49.1	100.0
Incomplete	10	3.4		
Missing	46	15.9		
Total	290	100.0	100.0	

Table B10(iv): The Importance of Quality

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	4	1.4	1.7	1.7
2	0	0.0	0.0	1.7
3	1	0.3	0.4	2.1
4	7	2.4	3.0	5.1
5	15	5.2	6.4	11.4
6	46	15.9	19.5	30.9
Very important	163	56.2	69.1	100.0
Incomplete	22	7.6		
Missing	32	11.0		
Total	290	100.0	100.0	

Table B10(v): The Importance of Another Reason

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	1	0.3	0.5	0.5
2	0	0.0	0.0	0.5
3	0	0.0	0.0	0.5
4	1	0.3	0.5	1.0
5	6	2.1	2.9	3.9
6	9	3.1	4.4	8.3
Very important	30	10.3	14.6	22.8
Not applicable	159	54.8	77.2	100.0
Incomplete	31	10.7		
Missing	53	18.3		
Total	290	100.0	100.0	

B11. How much do you normally spend on cannabis per transaction ?

Table B11(i): Amount Spent on Cannabis Per Transaction (low values)

Value($)	Frequency	Percent	Valid Percent	Cum Percent
10-25	125	43.1	46.6	46.6
26-50	37	12.8	13.8	60.4
51-100	32	11.0	12.0	72.4
101-199	1	0.3	0.4	72.8
200-500	59	20.3	22.0	94.8
501-999	2	0.7	0.8	95.5
1000-4000	12	4.1	4.5	100.0
Incomplete	10	3.4		
Missing	12	4.1		
Total	290	100.0	100.0	

Mean 198.00 Std Dev. 502.77

Table B11(ii): Amount Spent on Cannabis Per Transaction (high values)

Value($)	Frequency	Percent	Valid Percent	Cum Percent
10-25	98	33.8	36.6	36.6
26-50	50	17.2	18.6	55.2
51-100	32	11.0	12.0	67.2
101-199	3	1.0	1.1	68.3
200-500	70	24.1	26.1	94.4
501-999	2	0.7	0.8	95.1
1000-4000	13	4.5	4.9	100.0
Incomplete	10	3.4		
Missing	12	4.1		
Total	290	100.0	100.0	

Mean 230.63 Std Dev. 570.85

The relatively large number of incomplete answers were the result of buyers answering with broad word answers such as "it varies" rather than providing precise amounts.

B12. Using the scale below, please indicate how important each factor is in your decision to spend this amount per transaction ?

Answers are presented in tables B12(i) - (iv). This question suffered from the same problems as question B10, with some people ticking one option (ie. incomplete) and leaving the other reasons blank (ie. missing), rather than scoring the importance of every reason.

Table B12(i): The Importance of Budget

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	40	13.8	17.3	17.3
2	14	4.8	6.1	23.4
3	16	5.5	6.9	30.3
4	21	7.2	9.1	39.4
5	30	10.3	13.0	52.4
6	31	10.7	13.4	65.8
Very important	79	27.2	34.2	100.0
Incomplete	20	6.9		
Missing	39	13.4		
Total	290	100.0	100.0	

Table B12(ii): The Importance of Penalty

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	64	22.1	27.7	27.7
2	25	8.6	10.8	38.5
3	14	4.8	6.1	44.6
4	20	6.9	8.7	53.2
5	22	7.6	9.5	62.8
6	19	6.6	8.2	71.0
Very important	67	23.1	29.0	100.0
Incomplete	12	4.1		
Missing	47	16.2		
Total	290	100.0	100.0	

Table B12(iii): The Importance of Consumption Limit

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	61	21.0	26.5	26.5
2	26	9.0	11.3	37.8
3	23	7.9	10.0	47.8
4	23	7.9	10.0	57.8
5	25	8.6	10.9	68.7
6	29	10.0	12.6	81.3
Very important	43	14.8	18.7	100.0
Incomplete	21	7.2		
Missing	39	13.4		
Total	290	100.0	100.0	

Table 12(iv): The Importance of Another Reason

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	3	1.0	1.4	1.4
2	0	0.0	0.0	1.4
3	1	0.3	0.5	1.9
4	1	0.3	0.5	2.4
5	4	1.4	1.9	4.2
6	2	0.7	0.9	5.2
Very important	19	6.6	9.0	14.2
Not applicable	182	62.8	85.8	100.0
Incomplete	25	8.6		
Missing	53	18.3		
Total	290	100.0	100.0	

Section C: Selling Cannabis

One hundred and fifty-nine people were eligible to complete this section.

C2. Using the scale below, please indicate how important each factor is in your decision not to cheat on a cannabis transaction.

The results are presented in tables C2(i) - (ix). Similarly to Section B, a number of people misunderstood the questions instructions. Instead of scoring each of the reasons using the scale, they followed the instructions of previous questions and ticked one option and left the others blank. As a consequence there was a relatively high number of "incompletes" and "missings."

Table C2(i): The Importance of Fear of Physical Retaliation

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	36	22.6	30.5	30.5
2	12	7.5	10.2	40.7
3	13	8.2	11.0	51.7
4	6	3.8	5.1	56.8
5	12	7.5	10.2	66.9
6	12	7.5	10.2	77.1
Very important	27	17.0	22.9	100.0
Incomplete	7	4.4		
Missing	34	21.4		
Total	159	100.0	100.0	

Table C2(ii): The Importance of the Fear of Attracting the Police

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	33	20.8	27.5	27.5
2	12	7.5	10.0	37.5
3	3	1.9	2.5	40.0
4	9	5.7	7.5	47.5
5	14	8.8	11.7	59.2
6	12	7.5	10.0	69.2
Very important	37	23.3	30.8	100.0
Incomplete	9	5.7		
Missing	30	18.9		
Total	159	100.0	100.0	

Table C2(iii): The Importance of having a Limited Number of Customers

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	20	12.6	16.7	16.7
2	5	3.1	4.2	20.8
3	6	3.8	5.0	25.8
4	8	5.0	6.7	32.5
5	7	4.4	5.8	38.3
6	17	10.7	14.2	52.5
Very important	57	35.8	47.5	100.0
Incomplete	8	5.0		
Missing	31	19.5		
Total	159	100.0	100.0	

Table C2(iv): The Importance of the Fear of Being Betrayed to the Police

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	32	20.1	26.7	26.7
2	18	11.3	15.0	41.7
3	8	5.0	6.7	48.3
4	9	5.7	7.5	55.8
5	14	8.8	11.7	67.5
6	5	3.1	4.2	71.7
Very important	34	21.4	28.3	100.0
Incomplete	6	3.8		
Missing	33	20.8		
Total	159	100.0	100.0	

Table C2(v): The Importance of Money

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	9	5.7	7.5	7.5
2	3	1.9	2.5	10.0
3	4	2.5	3.3	13.3
4	18	11.3	15.0	28.3
5	13	8.2	10.8	39.2
6	12	7.5	10.0	49.2
Very important	61	38.4	50.8	100.0
Incomplete	9	5.7		
Missing	30	18.9		
Total	159	100.0	100.0	

Table C2(vi): The Importance of Reputation

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	18	11.3	15.1	15.1
2	4	2.5	3.4	18.5
3	4	2.5	3.4	21.8
4	6	3.8	5.0	26.9
5	10	6.3	8.4	35.3
6	17	10.7	14.3	49.6
Very important	60	37.7	50.4	100.0
Incomplete	9	5.7		
Missing	31	19.5		
Total	159	100.0	100.0	

Table C2(vii): The Importance of Selling Stocks

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	16	10.1	13.3	13.3
2	7	4.4	5.8	19.2
3	3	1.9	2.5	21.7
4	6	3.8	5.0	26.7
5	11	6.9	9.2	35.8
6	15	9.4	12.5	48.3
Very important	62	39.0	51.7	100.0
Incomplete	9	5.7		
Missing	30	18.9		
Total	159	100.0	100.0	

Table C2(viii): The Importance of Committing a more Serious Crime

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	31	19.5	27.2	27.2
2	6	3.8	5.3	32.5
3	4	2.5	3.5	36.0
4	12	7.5	10.5	46.5
5	11	6.9	9.6	56.1
6	11	6.9	9.6	65.8
Very important	39	24.5	34.2	100.0
Incomplete	10	6.3		
Missing	35	22.0		
Total	159	100.0	100.0	

Table C2(ix): The Importance of Another Reason

Value	Frequency	Percent	Valid Percent	Cum Percent
Not important	1	0.6	1.0	1.0
2	0	0.0	0.0	1.0
3	0	0.0	0.0	1.0
4	0	0.0	0.0	1.0
5	0	0.0	0.0	1.0
6	1	0.6	1.0	2.0
Very important	21	13.2	21.0	23.0
Not applicable	77	48.4	77.0	100.0
Incomplete	23	14.5		
Missing	36	22.6		
Total	159	100.0	100.0	

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