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Is property crime caused by drug use or by drug enforcement policy?

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The relationships among drug offenses, property crime, and the allocation of police resources are investigated in a structural model using data from Florida counties. Law enforcement resources are scarce, and as efforts to combat drug crime increase the amount of these resources allocated to property crime is reduced. This reallocation of police resources results in reduced deterrence for property crime and, as a result, an increase in these crimes. The evidence presented suggests that rising property crimes in Florida are at least partially the result of drug enforcement policy.

I. INTRODUCTION

Guided by the principle that people respond to incentives, economists studying crime have focussed their attention on the deterrence effects of arrest, conviction, and punishment. Recognizing that the offence rate, the level of police resources, and measures of deterrence are interrelated, simultaneous equation models have been employed to verify the postulates of the economics of crime for murder (Ehrlich, 1975; Hoenack and Weiler, 1980), aggregate crime rates (Ehrlich, 1973; Craig, 1987) and property crime (Ehrlich, 1973; Furlong and Mehay, 1981; Hakim *et al.*, 1984). Since these studies appeared, there has been an increasing perception that drug crime and drug enforcement have important impacts on the criminal justice system in general, and on property crime in particular.

Drug crime and drug enforcement may affect other crimes in at least two ways. First, some people argue that to explain the property crime rate (and, by implication, the aggregate crime rate), specific account must be taken of the large amount of predatory crime perpetrated by drug users (Ball *et al.*, 1983; Gropper, 1985; Johnson *et al.*, 1985). Both self-reporting and urine tests reveal that a high percentage of persons arrested for violent and property crimes abuse drugs, a fact that has led many to conclude that drug use causes crime because people must rob, burgle, and commit larceny to finance their habit. This suggests that a model of property crime tested with data gathered during the period of relatively high drug use may be misspecified if drug offences are ignored. Here, we investigate the relationships among drug offences, property crime, and the allocation of police resources in a structural model using data from Florida counties.[1]

A second potential impact of drug crime on other crime rates arises because law enforcement resources are scarce. Indeed, law enforcement decision-making can be seen as a resource allocation problem. Legislators must decide what proportion of resources to allocate to law enforcement (e.g. of police, courts and prosecutors, prisons, parole systems, etc.) given alternative uses of tax revenue (e.g. schooling, highways, etc.). After that, the resources purchased for the purpose of law enforcement must be allocated among competing uses (i.e. control of drug markets, investigation of robberies, burglaries, rapes, assaults and murders, etc.). An increased effort to prevent crime type A, which results in a reallocation of criminal justice system resources, may reduce the incentives to commit crime A, but it can also affect the incentives to commit other crimes. Several researchers have examined the consequences of substitution in relative law enforcement efforts; it appears that a relatively strong policing effort against one crime type (or in one police jurisdiction) induces substitution as some (existing) criminals shift to another crime type (or into crime in another jurisdiction).[2] Here, this proposition is taken one step further: if

[1]This paper draws from research done under contract with the Joint Legislative Management Committee of the Florida Legislature, 1989–90.

[2]See, for example, Furlong and Mehay (1981) and Hakim (1984).

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criminal justice resources are limited and some are shifted away from the control of crime type B to the control of A, crime B is less effectively deterred in an absolute sense, so crime B becomes more attractive. Some criminals substitute B for A in response to the change in relative deterrence, as suggested above, but the lower deterrence level for B will result in a greater number of offences both by existing criminals and new entrants attracted by a higher expected pay-off from crime B. Thus, one important opportunity cost of the resources used in an increased effort to control crime A may be an increase in crime B. One might say that the law enforcement policy toward crime A 'causes' crime B. This possibility is explored in the following analysis, where crime A is drug offences and crime B consists of property crimes.

The relationship between drug use and property crime is examined in the following section and Section III discusses crime control as an interrelated system in which policy makers face trade-offs when they allocate resources. Section IV describes an empirical model of property crime in Florida counties. The model is based on the economic theory of crime, and accounts for the potential effects of drug use and drug enforcement on property crime. Data are discussed and results are presented in Section V.

II. DRUG OFFENDERS AND PROPERTY CRIME

The alleged connection between drug use and property crime raises the possibility that drug enforcement is a 'positive sum' crime policy because control of drug markets is also expected to reduce property crimes. However, there is reason to question the contention that vigorously enforcing drug laws will reduce property crime.[3] Essential to this proposition is the assumption that there is either a causal connection between drug use and property crime, or that the population of drug users and the population of property criminals overlap significantly (e.g. both drug use and property crimes are caused by the same factors such that, in the extreme, the set of drug users is included in the set of property criminals). If all drug users commit property crimes, drug enforcement and direct efforts to incarcerate property offenders are close substitutes, differing only in the resources required for the different types of arrests and, perhaps, a different probability of arrest for property offenders who do not abuse drugs.

There certainly appears to be a correlation between daily drug use and criminal activities (NASADAD, 1990). Indeed, the fact that many criminals are drug users is well-documented: during the second quarter of 1989, for instance, approximately 84% of the male arrestees and 88% of the female arrestees in US metropolitan cities tested positive for one or more drugs (O'Neil and Wish, 1989). Similarly, in a Bureau of Justice survey of 12 000 prison inmates, over 75% admitted that they had used drugs, 56% acknowledged using drugs in the month prior to their incarceration, and one-third claimed to be under the influence of drugs at the time of their offence. But such correlation does not imply that causation necessarily runs from drugs to crime. In particular, the fact that most property criminals use drugs does not prove that most drug users commit property crimes.

Kaplan (1983), for example, questioned the supposed link between drug use and other criminal activity. His conclusions suggest that it is the illegality of drug use that can lead to additional criminal activity, not drug use itself. Consequences of making drug use illegal include: (1) forcing the prices of drugs up, requiring users to acquire greater resources; (2) making steady employment difficult because of the great deal of time and effort required to find a safe source of supply; (3) making holding any job difficult because of arrests and general harassment by police; and (4) forcing drug users into the criminal subculture because laws make them criminals and force them to deal with other criminals (much as prohibition did with alcohol users). Thus, Kaplan (1983, p. 57) contended that 'we cannot conclude on present evidence that heroin addiction is the only or even usually the most important factor in an addict's criminality'.[4]

Arguments such as Kaplan's imply that, *given illegality*, drug use and other criminal activity are causally related. The

[3]In Florida, between 1983 and 1987, there was a significant increase in resources devoted to drug offences; yet robbery, burglary, larceny, and auto theft offence rates rose during the same period. These facts appear to refute the contention that drug enforcement has a salutary effect on property crime. Since the relevant question is whether property crime would have been still higher in the absence of the drug enforcement policies, this simple comparison is not convincing evidence against the positive-sum hypothesis.

[4]Beyond raising doubts about the causal assumptions made by policy makers, Kaplan (1983, p. 52) found that, whatever the cause (heroin, or heroin illegality) the level of predatory crime committed due to a need to support a heroin addiction was not nearly as great as it was reported to be. The perceived level of addict-committed predatory crime (primarily theft) is extremely flawed because of the method used to estimate such crime. This calculation typically assumes that *all* drugs purchased by addicts are paid for through property crime. Thus, the calculation multiplies the average habit size reported by addicts by the estimated number of users, and by the street price of the drug. Naturally, many users have legal income sources such as jobs, parental assistance or welfare payments, so not all purchases require criminal activity. In addition, addicts raise a substantial amount of money through non-victim crime such as prostitution, pimping and drug sales (Kaplan, 1983, p. 54; Reuter, 1990). The published estimates are misleading for other reasons as well, and to see how misleading they are, note that a comparison of the property allegedly stolen by addicts in New York city with reported losses from crime there shows that addicts alone supposedly stole ten times as much as was reported to police in all the property thefts (Kaplan, 1983, p. 52). Under-reporting of crimes by victims certainly does not explain such a huge discrepancy, particularly when non-drug users do commit some property crimes. A similar point is made by Michaels (1987) when he notes that estimates of the number of drug addicts, when combined with the assumed drug–crime causal link, implies that property crime should be much higher than it is. See also Brown and Silverman (1974).

correlation between drug use and crime might disappear with legalization, but as long as use of drugs remains illegal, drug users will be forced to commit crimes. It may be that the relationship is not even this strong. There is evidence that the characteristics which lead an individual to commit crimes against persons and property also lead that individual to consume drugs. Criminals do not generally specialize, so 'criminally inclined' people are also 'inclined' to substance abuse (Gottfredson and Hirschi, 1990). In other words, given some individuals' risk perceptions, degree of myopia, and opportunity costs, drug use may be a gross complement to other crimes (i.e. as the 'price of committing crimes' falls because risk falls or expected returns rise, more violent and property crime is committed and more drugs are consumed). However, it does not follow that substance abuse induces criminal behaviour. This is, crime may not be a gross complement to drug use (i.e. as the price of drugs falls, and more drugs are consumed, more crimes are not necessarily committed).[5] But the relationship may even be weaker than this: it may be that for many drug users neither reciprocal complementarity nor substitutability within crimes apply in any systematic way. Many violent and property criminals could be addicted to illicit drugs, for example, even though a large portion of drug users do not commit non-drug crimes. Arrest and conviction data on drug offenders in Florida suggest that this characterization of the drug–crime relationship may be fairly accurate.

The history of persons having at least one misdemeanour or felony drug arrest in Florida during 1987 indicates that many have few previous recorded arrests for property crimes (Trager and Clark, 1989). Of the 45 906 people arrested for drug possession, over 80% had never been arrested for burglary and over 90% had never been arrested for other property crimes. Of those arrested for sales, only slightly more than 25% had prior burglary arrests, and again over 90% had no previous arrest for other property crimes. Of course, if police are emphasizing drug crime to the virtual exclusion of property crimes, such arrest statistics may be quite misleading. Nonetheless, these data suggest that two distinct types of drug users may actually exist. First, a substantial portion of drug offenders do not appear to be committing property crimes (or violent crimes – see Trager and Clark, 1989). Second, many criminals who commit index I crimes also use drugs.

This perception of the drug-using population is reinforced by a recent recidivism study (Kim *et al.*, 1990). From among those incarcerated in Florida after 1985 and released prior to 2 April 1990 4394 persons had drugs as a primary offence. By 2 April 1990, 49.6% (2180) of these 4394 had been returned to the custody of the Florida Department of Corrections via probation or re-incarceration. About 69% (1504) of the returnees were convicted of another drug offence while only about 31% were convicted for a non-drug offence (theft, burglary, and robbery accounted for about 65.1% of the non-drug offences or about 20.2% of the 2180 returnees). Again it appears that the majority of drug users may not be involved in non-drug crime, although such a conclusion is not necessarily warranted if the criminal justice system is overlooking non-drug crime in order to obtain more drug convictions. In this regard, however, Kim *et al.* (1990) found that the tendency to recidivate was significantly lower for those individuals who only had convictions for drug offences than for those who had convictions for both drug and non-drug crimes, reinforcing the perception that there may be two distinguishable groups of drug offenders: those who also commit index I crimes, and those who do not.

Arresting and convicting drug offenders may not lead to a corresponding reduction in the number of property offenders at large. Indeed, an increased law enforcement effort against drug crimes may, under this circumstance, be accomplished by shifting law enforcement resources away from the pursuit of property offenders. If fewer resources devoted to property crime causes these offences to become less risky (i.e. more attractive to offenders), the expected

[5]In fact, it is possible that the opposite effect may occur. A number of economists have noted that if drug users do finance their use through property crime, but their demand for drugs is inelastic, then as price rises, total expenditures on drugs will increase, and more crimes may be committed by existing users in order to finance these expenditures (Erickson, 1969; Koch and Grupp, 1971; Clague, 1973; Holahan, 1973; Eatherly, 1974; White and Lusetich, 1983). The opposite would, therefore, occur with a price fall. Of course, inelastic demand clearly does not imply that income must change as price changes. Indeed, income is presumably held constant when elasticity is calculated, so inelastic demand simply means that total expenditures on other goods and services change as the price of the good in question changes. But more significantly, this argument actually implies that drug users' labour supply decisions are very different from such decisions by most other people (Rasmussen *et al.*, 1990). The claim is that the changing price of drugs causes a change in the 'real wage from property crime'. The purchasing power of a dollar obtained through illegal actions declines significantly when the price of the drug rises, since presumably a large portion of the user's budget goes to the purchase of the drug. But, this implies that the drug user's 'supply of illegal labour' (i.e. the amount of effort he invests in illegal activities to generate income) is negatively sloped. As the real income per offence from such activity falls, more offences are committed. This is theoretically possible over some relevant range, but it certainly suggests that drugs significantly distort the behaviour of drug users in ways other than those often made explicit. The obvious question is why do these addicted criminals not commit more crime when the real return is higher as well? The traditional justification for the back-bending supply of labour is that as income becomes very high there is an incentive to reduce work effort in order to enjoy more leisure, but that does not appear to be a relevant option for low-income addicts. What then are addicts substituting for illegal work effort when the real return to such effort is relatively high? Drug use may distort individual behaviour sufficiently to produce such results, of course, but the hypothesized relationship between the price of drugs and property crime has not been rigorously supported by empirical evidence. Moreover, for the drug market as a whole, the assumption of inelastic demand is dubious even if it is appropriate for some consumers. See Moore (1977); White and Luksetich (1983); Rasmussen *et al.* (1990).

return to property offenders rises and an increased offence rate is expected. This scenario of limited resources to combat crime calls for an economic model that highlights the potential trade-offs between property offences and drug enforcement efforts in the interrelated criminal justice system.

III. CRIME CONTROL AS AN INTERRELATED SYSTEM

Becker's economic theory of crime (1968) led to a new area of empirical research as economists tested various hypothesized relationships between crime rates and the probabilities of arrest and conviction, the severity of punishment, and criminals' opportunity costs.[6] However, drug crime has not been examined empirically from the perspective provided by the economic theory of crime, partly because there is no reported crime rate and no ready proxy for the probability of arrest.[7] However, some of the consequences of drug enforcement policy can be empirically explored by recognizing that crime control is an interrelated system.

Law enforcement resources are limited in supply. Legislators at the federal, state and local level face tremendous competing demands for the allocation of tax dollars and are under pressure to hold total taxes down. Thus, resources available for the enforcement of law will permit solving only a portion of the crimes reported and imprisoning a minority of the criminals caught and successfully prosecuted. In the face of the apparent increasing political pressure to control illicit drug markets, the public sector response can take two forms.[8] First, a legislature may allocate more resources to law enforcement so that more can be allocated to drug control without sacrificing the current police efforts against other crimes. Of course, this either requires increased taxes or reduced expenditures for other publicly provided goods and services, so competing political demands will have to be taken into account and the resulting compromises will probably mean the shifting of some law enforcement resources away from other uses (e.g. direct control of property and/or violent crime) into drug control. This expectation is borne out in Florida.

The increasing political emphasis on illicit drug laws in Florida during the past several years has been accompanied by a substantial shift in the allocation of law enforcement resources over a fairly short period of time. For example, drug arrests accounted for 6.9% of Florida's 523 005 total arrests in 1982, but this rose to 10% in 1987 (68 747 of the 690 597 total) (FDLE, 1987). Drug arrests in Florida rose by 90% between 1982 and 1987, while total arrests rose by only 32%. Perhaps an even more relevant comparison is between drug arrests and arrests for index I crimes (murder, forcible sexual offences, aggravated assault, robbery, burglary, larceny, and auto theft). Index I arrests in Florida rose by only 27.3% between 1983 and 1987, from 140 656 to 179 029. Thus, police resources were allocated to make one drug arrest for every 3.7 index I arrests in 1983, but by 1987, resources had been reallocated so that one drug arrest was made for every 2.6 index I arrests.[9] Resources allocated to drug enforcement efforts are obviously rising faster than law enforcement resources (e.g. police manhours) available for crime control are being increased. Very little is known about the consequences of this large shift in the focus of law enforcement efforts.

Competing hypotheses are suggested by the preceding discussion. First, suppose that the population of drug offenders is identical to the population of criminals who commit property crimes. If this is the case, then arresting and imprisoning drug offenders is equivalent to arresting and imprisoning property criminals. The shift in the allocation of resources away from property crime enforcement toward drug crime enforcement should not then cost society anything in terms of increased property crime (there could be some cost if making drug arrests requires a different, more costly resource mix than making non-drug arrests, of course). On the other hand, if drug users and property criminals are totally separate populations, then the shift in resources should reduce the deterrence of property crimes and property crimes should increase. In this case, one opportunity cost of drug enforcement will be an increase in property crime. Finally, if there is some overlap between the drug offender population and the property crime population, then the shift in resources may have offsetting effects. In this case, the total effect of drug enforcement on property crime depends on the relative magnitudes of these two impacts: (1) more drug arrests should reduce the number of property criminals to the degree that the populations overlap (e.g. the arrest and conviction data cited above suggested that about 15 to 25% of the drug-using population also commits non-drug crime); and (2) property crime should increase because of the reduced deterrent effect associated with the reallocation of resources. Indeed, the existence of a significant trade-off effect can be interpreted as evidence that the 'drugs cause crime' argument is not valid, at least for

[6]For example, see Ehrlich (1973, 1975), Sjoquist (1973), Passell and Taylor (1977), Wolpin (1978), Hoenack and Weiler (1980), Ehrlich and Brower (1987) and Trumbull (1989).

[7]Kim *et al.* (1990) are an exception in that a recidivism study of drug offenders convicted and sentenced to prison in Florida provides empirical support for applying the economic theory of crime to predict the behaviour of drug criminals.

[8]See Rasmussen *et al.* (1990) and Benson and Rasmussen (1991) for more detailed discussion of the resource allocation process.

[9]Drug arrests have also increased relative to other index II arrests. Specifically, the ratio of drug arrests over all other index II arrests was 0.107 in 1983 and 0.155 in 1987. Index II includes a variety of crimes, such as simple assault, arson, narcotics, vandalism, vice, fraud, and major traffic violations; basically it encompasses all arrests other than index I crimes and minor traffic violations.

some portion of the drug-using population (i.e. that the two populations are not identical). An empirical model which allows us to explore these competing hypotheses is developed below.

IV. DRUG USE, DRUG ENFORCEMENT AND PROPERTY CRIMES

Empirical analysis of the implications of the economic theory of crime has evolved to a point where a fairly standard model is employed. The supply of offences and the demand for law enforcement services are assumed to be simultaneously determined in a structural model.[10] Such a model is employed here to explain the property crime rate, but with a significant departure from the existing literature in that it considers the impact of the drug market on the supply of property crime and the demand for police resources.

First, consider a standard supply of property offences function in which per capita property crimes, PC, are related to the probability of arrest, PA, and severity of punishment, SP, for such crime, the expected income from the criminal activity, CI, and opportunity costs from alternative legal activities, OC (and perhaps other environmental factors, EF).

$$PC = f(PA, SP, CI, OC, EF) \tag{1}$$

The first two factors represent the potential criminal's assessments of the costs he might bear if he commits the crime. Comparative statics analysis in the context of a general labour supply model does not provide definite predictions regarding the signs of the coefficients for these variables (Block and Heineke, 1975; Rasmussen *et al.*, 1990), but if criminals are like most other people (e. g. their labour supply functions are upward sloping, they are risk averse, etc.) then other hypotheses emerge (Rasmussen *et al.*, 1990), which empirical studies have frequently supported (for reviews see Silver, 1974; Elliot, 1977 and Benson, 1990). In particular, if the probability of arrest and punishment rises, an individual is less likely to commit the crime, and the supply of offences should diminish. Similarly, if the severity of punishment increases, then the number of offences can be expected to fall. On the other hand, if the gains from committing this crime rise, then more such crimes should occur. Finally, if the opportunities for legitimate income generation increase, then criminal activity should decline.

Production of enforcement affecting the probability of arrest and punishment, PA, depends on such factors as the size of the police force in a jurisdiction, POL, the overall level of crime being committed, CR, and characteristics of the community in which the crimes are carried out that may help or hinder the policing effort, $CC1$:

$$PA = g(POL, CR, CC1) \tag{2}$$

It is hypothesized that an increase in overall law enforcement resources should increase the chances of solving all types of crime, including the probability of arresting a property crime offender. However, if the overall level of crime that the police must attempt to control is high, the likelihood that property crimes will be solved is hypothesized to be reduced.[11]

Finally, a community's demand for police services, POL, depends on the level of crime in the community, CR, the level of income or wealth of the community, W, and perhaps other community characteristics, $CC2$ (to distinguish it from $CC1$ in Equation 2):

$$POL = h(CR, W, CC2) \tag{3}$$

Presumably, greater levels of crime increase the demand for crime control, and if crime control is a normal good, relatively wealthy communities should demand more police services.[12]

In order to explore the hypotheses regarding the relationships between drugs and property crime, drug market activity and/or drug enforcement efforts should be considered in all three of these equations. If the community wants the police to control both index I crime (the crimes against persons and property for which crime rate statistics are calculated) and drug crime, for instance, then Equation 3 is misspecified without some measure of the community's perception of the drug problem. More drug crime affects the probability of arrest for property crime in Equation 2 indirectly if it results in greater police resources, POL. But there is another possible effect as well. Given that police resources have alternative uses, an increase in POL need not have the expected effect on PA if all the new resources are allocated to the drug control effort. Thus, Equation 2 may be misspecified unless the allocation of police resources is considered. In particular, an increase in the proportion of police resources allocated to drug control, DA, may reduce the probability of arrest for property crimes. Thus, drug enforcement would feed into Equation 1 indirectly through PA. The number of drug users may also affect property

[10]For reviews of this literature see Brier and Fienberg (1980), Cameron (1988) and Rasmussen *et al.* (1990).

[11]Similarly, the severity of punishment depends on factors such as the length of prison terms, the rights of prisoners and the prison environment. However, we use county level data from the State of Florida to test our model. Characteristics of punishment are, by and large, determined at the state level. Obviously, the relevant characteristics of the state prison system do not vary by county. Furthermore, sentencing guidelines were in force during the time period of our data, so local judges' sentencing discretion was somewhat limited. One factor which may vary across counties is the probability of conviction given arrest, so it will be included as a separate variable in our supply of offences equation.

[12]Cook (1986) emphasizes that private security expenditures to harden targets are a substitute for publicly provided protection, suggesting a less important role for income in determining police resources than would be the case if private alternatives were not available.

offences directly. For instance, if drugs cause crime, a reduction in the number of drug users, *DU*, should reduce the level of property offences. Even if drugs do not cause crime, a reduction in the size of the drug market (e.g. through arrest and imprisonment of drug offenders or through enforcement efforts in one jurisdiction which induce drug offenders to move elsewhere[13]) will reduce the level of property crime in as much as some subset of the drug population also commits these offences. Therefore, Equations 1–3 should be respecified, respectively, as

$$PC = f(PA, SP, CI, OC, EF, DU) \quad (4)$$

$$PA = g(POL, CR, CC1, DA) \quad (5)$$

$$POL = h(CR, W, CC2, DU) \quad (6)$$

Simultaneous estimation procedures are employed below to explore these relationships.

V. DATA AND ESTIMATION

The model outlined above is tested using data from Florida's 67 counties for 1986 and 1987. Testing the economic theory of crime is limited by the available data which does not allow precise quantification of many of the variables that appear to be theoretically relevant. Thus, proxy variables must be employed. Consider first the dependent variables in Equations 4–6 (all the variables are defined in Table 1, Table 2 provides summary descriptive statistics). A true measure of

Table 1. *Definition of variables*

	Description
Endogenous variables	
PROPOFF[a]	Property crimes per 1000 population
Pa[a]	Property crime arrests/property time offences
SWORN[a]	Number of sworn officers per 1000 population
Exogenous variables	
Net return	
Pc[a, c]	Property crime convictions/property crime arrests
%DRUGARR[a]	Drug arrests/total arrests
TARGET[b]	Property valuation per capita adjusted for county cost of living variations
Opportunity cost	
WAGES	Wages and salary income per job adjusted for county cost of living variations
UNEMP[b]	Unemployment rate
%BLACK[d]	Percentage of population that is black
POP 15–24[d]	Percentage of population aged 15–24
SMSA	*SMSA* counties = 1, 0 otherwise
Other variables	
SIZE[c, e]	Drug market size per 1000 population, estimated with a reconviction model
NONPROPOFF[a]	Non-property crimes per 1000 population
POPGROW[d]	Population growth rate
POP[d]	Population
POP DEN[b, d]	Population per square mile
INCOME[b]	Per capita income adjusted for county cost of living variations
POP 50+[d]	Percent of population over age 50

Source:
[a]Florida Department of Law Enforcement, Statistical Analysis Center Data Base, Uniform Crime Reports.
[b]*Florida Statistical Abstract*, 1986–88.
[c]Florida State Courts Summary Reporting System.
[d]University of Florida, Bureau of Economic and Business Research.
[e]Florida Department of Corrections data base.

[13]There is evidence that increased enforcement in one community can cause a geographic spillover to neighbouring jurisdictions. These are generally modest in magnitude although Sollars *et al.* (1990) suggest they are significant among local jurisdictions (i.e. smaller than counties) in Florida when drug enforcement is added to the standard model of property crime spillovers.

the level of property crime is not available because many crimes are simply not reported. Therefore, reported property crimes (burglary, larceny, and robbery) per 1000 population, *PROPOFF*, are used as a proxy.[14] Similarly, the probability of arrest cannot actually be calculated. Instead, the clearance rate for reported crimes (property crime arrests divided by reported property crime offences), *Pa*, is used. Finally, the level of police resources is represented by the number of sworn police officers per 1000 population, *SWORN*.

Now, turn to the exogenous variables in Equation 4. First, consider the potential impact of the drug market on property crime. No actual measure of drug market size is available, nor are there estimates for individual counties. However, the wildlife management literature offers a technique for estimating the size of an unobserved population. Researchers in this area use a capture, tag and release, and recapture method to estimate wildlife populations (Scheaffer *et al.*, 1979). A sample of the population is captured in one time period, tagged and released. Then a second sample is captured in the next time period. The portion of the second sample which was tagged during the previous period is assumed to provide an estimate of the probability of capture for any individual animal. Thus, an estimate of the total population can be made: total population equals the number captured in the second period divided by the fraction which were previously tagged. In an analogous fashion, observation of the portion of drug convicts in each time period who are recidivists from a previous period should allow an estimate for the size of the drug market for a county, or at least for the size of that segment of the drug population which the criminal justice system tends to focus on. We proxy this with *SIZE*, which is the number of drug convictions in the county divided by the county's recidivism rate.[15] If the strong version of the drugs-cause-crime argument is valid (i.e. the one that contends that focussing on reducing the size of the drug market is a positive-sum crime policy), the coefficient on *SIZE* should be positive and fairly large (i.e. close to unity since both dependent and independent variables are logged in the following regressions, implying that the coefficients can be interpreted as elasticities). However, even if only some portion of drug users also happen to be property criminals a significant positive coefficient can still be anticipated.

Pa is expected to be negatively related to *PROPOFF*, given that such crimes can be deterred by police efforts.[16] The expected severity of punishment given conviction is not likely to vary significantly across Florida counties during this period because 'Sentencing Guidelines' were established for the state as a whole. However, the probability of conviction, given arrest, *Pc*, could vary by county and is, therefore, included in the analysis. *Pc* should be negatively related to the level of offences if it varies significantly among counties and serves as a deterrent. The potential pay-off to committing property crimes, *TARGET*, is proxied by property valuation per capita adjusted for county cost of living variations.[17] A higher potential pay-off should induce more crime.

The opportunity costs of committing crimes cannot be directly measured, so several labour market and socio-economic variables are used which together may proxy potential criminals' legal earning opportunities. They are: (1) wage and salary income per job adjusted for county cost of living, *WAGES*, (2) the reported county unemployment rate, *UNEMP*, (3) the percentage of county population that

[14]While auto theft is a property crime, it appears that a very large portion of the auto thefts in most Florida counties are for short 'joy rides'. If this is the case, then including it would tend to bias the results away from supporting the argument that drugs cause crime because of a need to finance drug consumption. Therefore, in order to avoid this bias, auto theft was excluded from the analysis. See also footnote 16.

[15]The recidivism rate defined as a return to Department of Correction Control (via incarceration or probation) is estimated with a sample of 4398 drug offenders who were adjudicated guilty, sentenced to prison, and released between March 1983 and 29 May 1983. Returns to DOC control up to 2 April 1990 are used to calculate the recidivism rate for the county of conviction. For some non-metropolitan counties the number of drug convicts was small, so the recidivism rate for these observations was proxied by the state-wide rate for non-metropolitan counties. The data base used is described in Kim *et al.* (1990).

Obviously, this is an imperfect measure of drug market size in that it assumes a stable population of drug offenders, identical capture efforts over time within a county, and no behavioural adjustments by previously convicted criminals. However, it may be a reasonable proxy (i.e. monotonically related to the true drug population) if county populations of drug offenders and county police efforts against drug markets are changing in similar fashions, and if behavioural adjustments are similar across counties. At any rate, it is the best proxy available.

[16]A common criticism of the economics of crime literature is the possibility of a spurious correlation between *PROPOFF* (offences/population) and *Pa* (arrests/offences) that arises because of errors in the measurement of offences. Some argue this problem is insurmountable and compromises these models (Brier and Fienberg, 1980) while more pragmatic observers note similarities in other well-established, econometric models of labour market behaviour (Taylor, 1978). A few studies have been able to avoid this measurement problem by using actual crime rates from victimization surveys, however, and they provide strong evidence for a deterrent effect from the probability of arrest. Myers (1980) compared the deterrent effects using separate analyses that use reported crime rates and crime rates corrected for under reporting, for example. He concluded that estimated deterrent effects are similar and that 'under reporting does not really matter'. That is, spurious correlation does not appear to be a real problem. In fact, in Craig (1987), the coefficient of *Pa* became more negative when actual crime was used rather than reported crime. This is the only instance where we were not able to specify the model in a way that avoids even the possibility of spurious correlation, but Myers (1980) and Craig (1987) indicate that this may not be a serious flaw.

[17]The Florida Price Level Index (FPLI), computed annually for counties by the state of Florida, is used to adjust for geographic cost of living differences within the state. County variation in the FPLI is substantial; in 1987 the index ranged from 88.84 to 108.97, compared to the state average value of 100.

Table 2. *Summary statistics*

Endogenous variables	Mean	Standard deviation
PROPOFF	44.72	23.65
Pa	0.23	0.12
SWORN	1.80	0.60
Exogenous variables		
Net return		
Pc	0.48	0.35
%DRUGARR	0.36	0.18
TARGET	6296.92	10 582.12
Opportunity cost		
WAGES	160.47	20.87
UNEMP	6.31	1.99
%BLACK	15.10	10.23
POP 15–24	14.83	3.28
SMSA	0.48	—
Other variables		
SIZE	3.13	2.24
NONPROPOFF	7.72	4.40
POPGROW	3.58	2.06
POP	176 876.50	304 346.28
POP DEN		
INCOME	12 790.96	2873.0
POP 50+	32.28	9.63

Source:
[a]Florida Department of Law Enforcement, Statistical Analysis Center Data Base, Uniform Crime Reports.
[b]*Florida Statistical Abstract*, 1986–1988.
[c]Florida State Courts Summary Reporting System.
[d]University of Florida, Bureau of Economic and Business Research.
[e]Florida Department of Corrections data base.

is black, *%BLACK*, (4) the percentage of the population between the ages of 15 and 24, *POP* 15–24, (5) population growth rate, *POPGROW*, and (6) a dummy variable to indicate whether the county was in a Standard Metropolitan Statistical Area (*SMSA* = 1) or not (*SMSA* = 0). If *WAGES* and *UNEMP* effectively capture opportunity costs for potential criminals, they should, respectively, be positively and negatively related to offences. Similarly, an *SMSA* may offer more opportunities for employment that non-*SMSA*s do, implying a positive sign for its coefficient. Labour market studies indicate that blacks tend to earn less income than whites with similar attributes and in the same location, so *%BLACK* complements the average earnings measure by providing some evidence of the portion of the county's population which is likely to have below-average earnings. If this percentage is relatively large, relatively more property crime can be anticipated. Finally, earnings typically rise with age, implying that the opportunity cost of crime rises as one gets older. Thus, a relatively large portion of the population which is young should be associated with a relatively high crime rate.[18] Equation 4 is, therefore, estimated as

$$PROPOFF = f(SIZE, Pa, Pc, TARGET, WAGES, UNEMP, POPGROW, \%BLACK, POP\,15\text{–}24, SMSA) \quad (7)$$

The probability of arrest in Equation 5 is expected to be positively related to *SWORN*. Data on the portion of actual law enforcement resources allocated to drug enforcement (e.g. officers in a narcotics squad) are not available. Therefore, the relative allocation of police resources to drug enforcement is proxied by drug arrests divided by total index I arrests, *%DRUGARR*.[19] As more resources are allocated to drug enforcement, *ceteris paribus*, the probability of arrest for property crimes should fall. The probability of arrest for property crimes should also depend on the total potential work load that the police face. Thus, if a relatively high number of crimes of all types are committed

[18]Age actually may affect criminal behaviour through many channels. Perceptions of punishment may vary with age, for instance. Youthful offenders receive relatively light sentences in most jurisdictions, a permissiveness that may contribute to relatively high rates of criminality among young people. Furthermore, anticipated punishment may be more highly discounted by young people if they are more myopic than older persons. Severity of punishment may also be a relative phenomena rather than absolute: a three-year prison sentence for a 20-year old who expects to live another 50 years may be less severe than a three-year sentence for a 60-year old who sees it as a significant portion of his remaining life. Finally, one prominent theory is that preferences for crime actually falls with age, sometimes attributed to criminal burn-out (Hoffman and Beck, 1984) and maturity (Gottfredson and Hirschi, 1990). From an economic perspective, 'maturity' might involve an increase in risk aversion. Thus, while we assume that age is an opportunity cost proxy, it must be recognized that these diverse impacts of age cannot actually be separated and the relative strengths of the various interpretations cannot be evaluated.

[19]Index I arrests appear to be the ones that are most affected by the reallocation of resources. When we use drug arrests over all other arrests, the trade-offs are not statistically significant. There are two explanations for this result, one statistical and the other theoretical. Statistically, the large number of total arrests dwarfs drug arrests in counties, resulting in a smaller variation in the trade-off variables when all non-drug arrests are included in the denominator. Since non-drug index II arrest rates are more homogeneous among counties than index I rates, this specification reduces variation in the sample and reduces the significance of the trade-off variable. Perhaps, more important is a theoretical point about the pattern of police trade-off behaviour between index I and index II arrests. Index I crimes can often be characterized as requiring police to expend resources to search for the offender, since the crime is typically completed before it is reported to the police and the perpetrator is not known to the victim. Robbery, burglary, larceny and motor vehicle theft can be characterized in this way and, in 1989, accounted for almost 78% of all index I crimes. In contrast, index II crimes may involve little search by the police in that the police simply make an arrest when they observe the offence, or when it is reported and the perpetrator is known to the victim. The structure of non-drug index II offences is uncertain since over 58% are categorized as 'miscellaneous'. This category, together with liquor law violations (i.e. driving under the influence of liquor), and simple assault account for 84% of all non-drug index II offences. Since police can make an arrest for many index II crimes as soon as they witness the event or know who the offender is, the cost of making an arrest is modest. In contrast, many index I arrests require the expenditure of extra resources in searching for the perpetrator after the offence is reported, making these offences a more likely trade-off candidate when additional drug arrests are made.

in a jurisdiction, the competing demands for police resources could reduce the likelihood of solving property crimes. This suggests that the total reported crime rate should be included as an exogenous variable in the *Pa* equation. However, with reported property crime in the denominator of *Pa* and reported property crime as part of the total crime rate, the potential for spurious correlation arises. Therefore, all index I crimes other than property crimes per 1000 population, *NONPROPOFF*, is used. In this way, alternative uses of police resources are accounted for and the potential for spurious correlation is avoided. Furthermore, if the resulting coefficient is significant, it provides support for viewing property crime enforcement as part of a system involving trade-offs in the allocation of scarce resources. *Pa* should be negatively related to *NONPROPOFF*.

Community characteristics may also influence the likelihood that property crimes will be solved. Perhaps, as the population is larger and more densely packed, criminals are more likely to be observed in the act and reported, for instance. Thus, county population, *POP*, and population density per square mile, *POPDEN*, are included as exogenous variables. Alternatively, smaller communities may be more homogeneous, so that neighbours establish reciprocal ties and become more likely to report observed

Table 3. *2 SLS estimates for the structural equation*

	Dependent variables		
	log *PROPOFF*	log *Pa*	log *SWORN*
log *NONPROPOFF*		−0.693*	
		(−4.84)	
log *PROPOFF*			0.122*
			(2.94)
log *Pa*	−0.826*		
	(−6.49)		
log *SWORN*		0.341***	
		(1.72)	
log *Pc*	−0.088***		
	(−1.81)		
log *%DRUGARR*		−0.199**	
		(−2.33)	
log *TARGET*	0.194*		
	(4.35)		
log *WAGES*	−0.966		
	(−0.32)		
log *UNEMP*	0.114		
	(1.05)		
log *%BLACK*	0.124***	0.130**	0.107**
	(1.94)	(2.15)	(2.55)
log *POP 15–24*	0.324		
	(1.62)		
SMSA	0.145		
	(1.40)		
log *SIZE*	0.183*		0.173*
	(3.43)		(5.24)
log *POPGROW*	0.047	−0.047	
	(1.02)	(−0.85)	
log *POP*		0.360***	
		(1.80)	
log *INCOME*			0.248***
			(1.79)
log *POPDEN*		0.383***	
		(1.82)	
log *POP 50+*			0.123
			(1.37)
CONSTANT	2.169	−5.846**	−1.945*
	(0.32)	(−2.24)	(−2.75)
R^2	0.75	0.36	0.41
F	38.96*	11.51*	19.29*

*Significant at 1% level.
**Significant at 5% level.
***Significant at 10% level.

criminal activity, and criminals may be more likely to be observed because neighbours know who belongs where. A rapidly growing community, on the other hand, may imply that criminals are less likely to stand out and be recognized, and that strong relationships between neighbours do not exist. Thus, the percentage change in population, *POP GROW*, is included in Equation 7. The black population is generally concentrated in distinct neighbourhoods that are characterized by relatively low opportunity costs which lead to a relatively high offence rate. It is clearly the case, for instance, that low-income individuals, including blacks, are relatively likely to be crime victims. This residential segregation of the black population may result in a concentration of offences into a relatively small area of the jurisdiction, thereby allowing the police to concentrate their resources, and increase the clearance rate. An alternative, but not mutually exclusive possibility, is that the police are more likely to arrest low-income black persons on weak evidence, a form of discriminatory behaviour that would raise the arrest/offence ratio. In either case, it is appropriate to include *%BLACK* in the equation to control for these effects. Equation 5 is, therefore, estimated as:

$$Pa = g(SWORN, \%DRUGARR, NONPROPOFF, POP, POP\,DEN, \%BLACK, POPGROW) \quad (8)$$

The demand for policing in Equation 6 should be determined by the overall level of property and violent crimes in the community. However, property crime rates and violent crime rates are highly correlated, so when both are used in the demand equation, multicollinearity becomes a problem. Therefore, *PROPOFF* is included in the estimation, with the expectation of a positive relationship between this variable and *SWORN*. Similarly, if voters demand a strong police effort against drug offences, then *SIZE*, which represents a measure of the number of 'problem' drug users, should be positively related to *SWORN*. Income in the community is represented by per capita income adjusted for county cost of living variations, *INCOME*. If police protection is a normal good, the coefficient will be positive. Low-income individuals are relatively likely to commit crime, as noted above, but they are also relatively likely to be the victims of crime. A larger portion of the population in this victim-prone group could generate stronger demand for police services. We use *%BLACK* to proxy the portion of the population which is likely to have below-average levels of income. Similarly, elderly people may be relatively attractive victims and/or be relatively risk averse and, therefore, have relatively strong demands for police services. The percentage of the county population over the age of 50, *POP 50+*, represents this possibility. Equation 6 is estimated as

$$SWORN = h(PROPOFF, SIZE, INCOME, \%BLACK, POP\,50+) \quad (9)$$

Table 3 reports the results of the two-stage, least-squares estimations.[20] All of the crucial hypothesized relationships are supported by the data. Let us briefly discuss some of the non-drug variables before focusing on the impacts of the drug market and drug enforcement policy on property crime. The offence equation clearly supports the economic theory of crime in that incentives matter. Property crime can be deterred, for instance. Both the probability of arrest and the probability of conviction have significant negative impacts in the supply of property offences equation. Furthermore, the potential pay-off of property crime, proxied by real-property valuations, has a significant and positive impact on the property crime rate. Proxies for legal opportunity costs do not come through as strongly, although the percentage of the population which is black has the expected sign and significance.

The probability of arrest for property crime is affected by both police resources and community characteristics. The number of police officers per capita is positively related to the probability of arrest.[21] However, as the competing demands for the attention of police (the level of other kinds of index I crime) rises, the probability of solving property crimes falls. The relatively large coefficient on this variable clearly indicates that police resources are scarce and that trade-offs are substantial. County population and population density are both positively related to the probability of arrest, suggesting that there may be some economies of urbanization in policing. The percentage of the population which is black is also significantly related to the probability of arrest, supporting the idea that police tend to concentrate their efforts in geographically concentrated low-income neighbourhoods, thereby increasing their effectiveness, or that they tend to arrest low-income blacks more readily (e.g. with less evidence) than members of other groups.

[20]Two-stage-least-squares was used because it is relatively robust to specification error in the rest of the system.

[21]It is interesting to note, in this regard, that the economics of crime literature often does not find a significant relationship between the level of police resources and the probability of arrest for any particular type of index I crime (Cameron, 1988). We suggest that those studies which have not found a significant relationship between these variables have generally failed to control for the allocation of police resources. Police do a lot more than simply arrest index I criminals (e.g. in 1987, index I arrests accounted for only 25.9% of total arrests, down from 26.3% in 1983). An increase in resources need have no impact on index I crimes if all the resources are allocated to other uses. The major reallocation effect has been in the drug control area over this period. Index II arrests other than drug arrests increased by 24.6% between 1983 and 1987, which is very similar to the rate of increase in index I arrests (27.3%), both of which are substantially different from the 90% increase in drug arrests. Thus, by controlling for the resources allocated to drug enforcement, we have controlled for the major allocation issue of the period, and we find that the level of police resources now has the expected negative impact on the probability of arrest for property crimes.

The demand for law enforcement resources is greater when crime rates are higher, as expected.[22] In addition, the portion of the population which is black is positively related to *SWORN*, implying that when a larger portion of the population is in this victim-prone group, apparently there is a stronger demand for police services.

Now, turn to the effects of drug offences and drug enforcement policy on property crime. Since the dependent and the independent variables are logged, the coefficients can be interpreted as estimates of elasticities. Thus, for instance, it appears that police are doing what voters are demanding in that a 1% increase in *SIZE* implies that police resources will be increased by 0.173%. Furthermore, some drug offenders do commit property crimes since a 1% increase in *SIZE* indicates that property crime will rise by approximately 0.183%. Indeed, this coefficient is consistent with the data showing that between 15 and 25% of the persons arrested for drug offences in 1987 had a history of property arrests (Trager and Clark, 1989). That is, this parameter estimate supports the hypothesis that there are two distinct groups of drug users: those who commit other crimes and those who do not.

This hypothesis is further supported by the coefficients on the *%DRUGARR* in the *Pa* equation and *Pa* in the *PROPOFF* equation, which together indicate the magnitude of the resource allocation consequence of drug enforcement (if the drug using and property offender populations were identical, this allocation impact should be insignificant).[23] The elasticity of *Pa* with respect to *%DRUGARR* and of property crime rate with respect to *Pa* are −0.199 and −0.826, respectively. A 1% increase in *%DRUGARR*, therefore, raises the property crime offence rate[24] by an estimated 0.164. There is a trade-off associated with the allocation of police resources then, and the argument that drugs cause crime can be rejected, at least for a subset of the drug-using population. On the other hand, *SIZE* is positively and significantly related to *PROPOFF*. The effect of drug crime on property crime, therefore, depends on the relative magnitude of these offsetting effects.

We cannot directly estimate the relationship between the allocation of police resources and drug crime since we have no measure of probability of arrest for drug offences and can only indirectly proxy the size of the drug market. For illustrative purposes, however, suppose that police resources are equally effective in arresting and deterring drug crimes and property crime. This is not likely, of course, particularly if addiction is a significant determinant of behaviour among drug consumers (i.e. changing the probability of arrest may not be as effective at deterring drug offences as it is at deterring property crime). Nonetheless, if we assume that the 0.199% reduction in probability of arrest for property crime associated with a 1% increase in *%DRUGARR* exactly offsets a 0.199% increase in the probability of arrest for drug crime, and if these changes in turn deterred drug crime in exactly the same way that *Pa* affects *PROPOFF*, then the drug market would be reduced by 0.164% (0.199 times 0.826). Thus, the 1% increase in *%DRUGARR* could reduce property crime by about 0.030% (0.164 times 0.183) through its impact on *SIZE*, only partially offsetting the 0.164% increase in property crime arising with the reallocation of police resources.[25] Even under these very optimistic assumptions about the relative effectiveness of police efforts against drug crimes, an emphasis on drug enforcement is clearly not a positive-sum crime control policy.[26]

VI. CONCLUSIONS

Are rising crime rates caused by drug use or drug enforcement? This question cannot be fully answered. However, a partial answer is possible: (1) drug enforcement policies do appear to cause property crime; (2) the population of drug offenders is not identical to the population of property criminals, so drugs clearly do not lead to crime for all drug

[22]It might be contended that budgeting decisions for the current year are made at the beginning of the year based on the previous year's crime levels and drug control activity. This implies that decision-makers are not forward looking in that they do not try to estimate future needs, an assumption which we question. Nonetheless, we did explore this possibility. In both two-stage-least-squares and OLS models the signs of the coefficients did not change, indicating that the system is quite robust.

[23]We recognize the potential for spurious correlation between *%DRUGARR* (drug arrests divided by total index I arrests, including property crime arrests) and *Pa* (property crimes divided by property crime arrests). Therefore, as a check we ran the same system of equations, but with one exception: *%DRUGARR* was replaced with drug arrests over non-property index I crimes, *%DRUGNPRAR*. The offence supply and resource demand equations were identical to those reported in Table 3, and the probability of arrest equation had no changes of sign or significance. Spurious correlation does not appear to be a problem here.

[24]We recognize the limitations of these point estimates for assessing the long-run impact of changes in exogenous policy variables. Transforming the structural model into a reduced form and forecasting the long-term impacts confirm the evidence presented here regarding the magnitude of the impact of drug policy on the property crime rate. For example, the reduced form estimates suggest the long-term multiplier of *%DRUGARR* with respect to *PROPOFF* is 0.159, which is virtually identical to the point estimate reported in the text.

[25]If we carry these assumptions all the way through, then a 0.164 reduction in *SIZE* implies that *SWORN* falls by roughly 0.028% (0.164 times 0.173), and this in turn implies that *Pa* will fall by roughly 0.01% (0.028 times 0.341). Since *Pa* has a significant negative impact on *PROPOFF*, the reduction in *SWORN* resulting from the reduction in *SIZE* means that property crime will rise by another 0.008% (0.01 times 0.826).

[26]Indeed, the reduced form estimates (see footnote 23) imply that this assumption is overly optimistic since they provide a long-term multiplier of *SIZE* with respect to *PROPOFF* of 0.13 rather than the 0.164 derived above.

offenders, and (3) drug use may cause property crime among a subset of about 15 to 25% of the drug-using population but there are other plausible reasons for the apparent correlation between property crime and drug use.

Evidence presented above indicates that rising property crimes in Florida are at least partially a result of drug enforcement policy. As police resources are shifted away from the control of index I crimes in order to focus on drug control, the probability of arrest for property crime falls. Since property crime is less effectively deterred, such crimes increase. And this is only a part of the consequence of the drug enforcement effort. For example, as drug arrests and prosecutions increase, the severity of punishment for many crimes declines in Florida because of prison crowding and increasing reliance on early release to solve the crowding problem. The rapid increase in prison admissions for drug offences (from 2661 in the first half of FY 1986–87, which made up 21.5% of total admissions, to 9222 or 36.6% of admissions in the first half of FY 1989–90) should substantially shorten the expected portion of prison sentences that will actually be served, since the early release program has reduced the average portion of Florida prisoners' sentences served from 40.6% in January 1988 to 33% in December 1989. This is an 18.7% decline in two years. In fact, about 37% of the prisoners released in December 1989 served less than 25% of their sentences, and some served less than 15%. If expected punishment is a deterrent factor, these shorter sentences should cause an increase in crime. These changes are occurring at the state level rather than at the county level so they cannot be accounted for in our study, but a complete estimate of the opportunity cost of drug enforcement should also include consideration of the increase in crime associated with the reduced severity of punishment.

The size of the drug market is correlated with the level of property crime. Correlation does not establish a drug–crime causal relationship, however, and results discussed here do raise significant questions about the claim that drug use causes crime. The coefficient on the drug market size proxy in the property offences equation is consistent with the implications of arrest and conviction records which indicate that property crime activity tends to be concentrated among a relatively small portion of the drug-using population. Thus, there appears to be two distinct groups of drug users: those who commit a substantial amount of non-drug crime account for somewhere around 20% of the population, while the majority of drug users are not very active in non-drug crime.

It should be recognized that the drugs-cause-crime arguments may be perfectly valid for a subset of the drug population. After all, people who commit property crimes are generally doing so to finance their consumption of the goods and services they desire. Such desires might be said to 'cause' the criminal activity. If these criminals are drug users, it follows they are committing crime to finance their drug consumption, so in a sense, the desire to consume drugs 'causes' crime. Of course, the desire to own a television set may cause crime in the same sense. However, addiction and the apparent accompanying increasing tolerance for drugs can lead to increased demand for drugs (Becker and Murphy, 1988; Rasmussen *et al.*, 1990) and this could in turn cause the criminally inclined addict (e.g. someone already committing crimes or someone facing incentives for which some marginal change in preferences due to addiction can induce entry into property crime) to commit more crime. But even if this drugs-cause-crime argument is valid for a subset of the drug-using population, a policy that focuses on the indiscriminate arrest and punishment of drug users in order to lower property crimes may be misguided if a substantial portion of the users who are arrested and convicted are not actually committing such crimes, as data presented here suggest. And beyond that, such a policy may not be very effective even for those drug users who do commit property crimes. Some of those for whom the marginal impact of addiction induces criminal behaviour might be deterred from trying drugs and therefore, they may not become criminals, but many others who might be deterred from drug use would probably be criminals anyway in order to finance their consumption of other goods and services. After all, our empirical results indicate that the decision to choose property crime as a source of income is driven by considerations of background and values, opportunity costs, along with the risks and severity of punishment, even when we control for drug market effects. Eliminating drug use for an individual is not likely to change all of the incentives relevant to this choice, particularly since police resources and prison space used in drug control cannot be simultaneously employed to control other crimes.

Finally, note that even for those drug users who do commit property crimes, causation could easily be running from crime to drugs. Consider the following scenario. As a consequence of the reallocation of law enforcement resources to control drugs, those who commit property crimes are less likely to be arrested. Thus, existing criminals will commit more crimes before being caught and the change in deterrence may be sufficient to attract entry of new criminals into the business of property crime. Some of the existing criminals who increase the level of their property offences and some of the entrants will probably be drug consumers, but some need not be. All individuals who choose to obtain some or all of their income through property crimes commit more property crimes and have more income to spend, and as policy-makers claim, property crime is surely a major source of income for at least some important portion of the population of drug users. Income is a determinant of the demand for all goods, including drugs. If drugs are normal goods, the demand for drugs will increase under these circumstances. The size of the drug market could even expand if the demand increases in response to the increase in income arising because of the reduced deterrence for property crimes exceeds the deterrence impact of a greater law

enforcement effort against the drug market.[27] Under this scenario, even for the subset of the drug population that does commit property crime, causation runs from law enforcement policy through increases in property crimes to increases in drug use. And when the police arrest a drug user there will be a somewhat higher probability that he has committed a property crime.

A more effective way to deal simultaneously with the size of the drug market and with predatory crime, whether drugs cause crime for some portion of the drug-using population or not, appears to require a reallocation of enforcement resources in order to focus on property crime categories. Increasing the level of deterrence for property crime would have the desired impact on such crime. Similarly, it *could* have an impact on the level of drug use by reducing income for those users who have chosen crime as their source of income.[28] This is only a conjecture at this point, of course, but it illustrates the potential policy implications that arise when criminal justice is viewed as an interrelated system and law enforcement is recognized to be a resource allocation problem.

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[27]Notice that demand might appear to be very inelastic (see footnote 5) whether or not there is an increase in demand accompanying the increased law enforcement effort. In other words, the *ceteris paribus* assumption does not hold and that may be the reason why law enforcement induced changes in drug prices appear to have very little impact on the size of a drug market.

[28]The apparent failure of the drug enforcement effort over the last several years (see Rasmussen *et al.*, 1990) suggests that such an alternative approach might not be much less effective at any rate.

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