

The Laws of Supply and Demand

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1. Introduction

In research done three years ago¹, we considered the social costs of Australian drug policy in 1987–88. There are several components to social costs: the public expenditures by governments, the private expenditures of individual households, and the non-monetary burdens imposed on society. The earlier work attempted to estimate the public and private expenditures on the criminal-justice system and the health-care system, and the further, non-monetary net costs associated with the Australian drug laws, and argued that control and regulation was preferable to prohibition, using what economists call a cost–benefit approach, broadly related to the drug-policy analysts’ “harm reduction”. The earlier work relied on several sources for its data, and the results were dependent on the quality of this data, not always as high as that available for the supply and demand of licit drugs. In this paper we attempt to update the earlier work, with a greater focus on the laws relating to cannabis than before, when the primary interest was with heroin and other illicit opiates.

The recent data on cannabis use (DHHCS, 1992) show a slight increase in the number of Australians of 14 and over who have ever used cannabis. The survey also provides data on the percentages of people who have ever been offered cannabis, those who have used cannabis in the last twelve months, and those who would try cannabis if it were offered by a “trusted friend”. The results are summarised in Table 1, together with the results from earlier surveys. The survey also provides data by sex and age group for a range of illicit (and legal) drugs. The table shows that the proportion of Australian who have ever been offered, who have ever tried, and who would try a friend’s cannabis, is stable and perhaps slightly increasing over the past six years.

An additional source of information on illicit drug users — but one that is not as reliable as the survey data above — comes from the Australian Federal Police (AFP) annual survey on prices and drug seizures. The price ranges are quoted for wholesale and retail transactions by drug type. The AFP notes that “annual totals of illicit drugs seized cannot be regarded in

1. The most detailed version is Marks (1991), although there are two other published reports.

Year	Ever been offered cannabis	Ever tried cannabis	Used cannabis in the past year	Would try friend's cannabis
1985	40	28	na	16
1988	40	28	na	14
1991	43	32	13	17

TABLE 1. Percentages of Australians aged 14 and over.

Source: DHHCS (1992) Tables 22, 24, 25.

isolation as a measure of enforcement performance, any more than they can be said to be indicative of the relative availability of illicit drugs” (AFP 1991, p.14), but together with the price data, it is possible to draw the conclusion that cannabis availability is unchanging over the two-year period 1989 and 1990.

The AFP notes that the wholesale price of domestic cannabis leaf fell in the higher wholesale price range (between \$4,000 and \$7,000 per kilogram), but rose at lower wholesale prices (between \$2,000 and \$2,500 per kilogram), possibly due to localised shortages. The retail price (between \$8 and \$50 per gram) was considered stable. There was a ten-fold increase in seizures between 1989 and 1990 (to 2.477 tonnes of cannabis tops, seeds, and resin) but since this is not at all reflected in higher prices at the wholesale or retail level, we should not be surprised with the AFP conclusion that “Cannabis products continued to be freely available in all states” (AFP 1991, p.10).

Of the total 2.477 tonnes of cannabis seized, 88% was imported cannabis, and 12% domestically grown, but this in no way should be taken to reflect the proportions of supply, since the AFP noticed a general trend towards smaller, better concealed domestic plantations. At the same time, they detected increased imports from Papua New Guinea.²

2. Revised Drug Law Enforcement Expenditures

Since 1987–88 the total population has grown by over 1.2 million people, or 7%, and there has also been price inflation of 21% (1994 Yearbook Australia, Tables 6.4 and 21.5). On the face of it, this suggests that the expenditure

2. This also worries the PNG authorities, in an economy with very high unemployment, and the additional pressures of a poor, developing society.

estimates of the earlier research can be updated simply by adjusting by 30% to reflect the larger population and inflated 1991 dollar, but we shall attempt to consider each component cost.

The Cleeland Report (1989, Table 4) conservatively put the 1987–88 drug law enforcement expenditures at \$123.2 million, based on the expenditures on the Australian Federal Police and the state police forces, the National Crime Authority (NCA), the Australian Customs Service (ACS), and the expenditures on prisons and courts. Since the law-enforcement agencies do not present their budgets in such a way that their spending on drug law enforcement can be identified, the Cleeland Report based its estimates on the proportion of officers engaged in drug law enforcement work directly. The Report counted 60% of the NCA budget, and pro-rated the other budgets. As Marks (1991) pointed out, this is very conservative, since it ignores the proportion of officers engaged in coping with drug-related crimes, such as property crimes committed by drug users.

Among other social costs, the Cleeland Report ignored the capital expenditures on prisons, the expenditures on legal aid, the expenditures on private legal representation, and the costs of time and delays for non-forensic participants in the courts. Marks attempted to estimate the first two from publicly available data. The main adjustment he made was multiplying the Report's figures by a factor of 2.5, which was obtained by imputing a proportion of 40% of the Australian prisoners on 30 June 1988 who had been convicted for various kinds of theft³ as being in prison on drug-related charges, in that the thefts were to support purchases of illicit drugs at the high, black-market prices. 44.1% of all 5,431 prisoners had been charged or convicted on theft offences. Since the state police forces' drug law enforcement officers constituted just above 1% of their total officers — and it was this proportion on which the Cleeland Report had based its estimates — such an adjustment for the expenditures on these forces is conservative.

After the adjustments to the AFP and state police force estimates (but not to the NCA or the ACS estimates) and after adding estimates for the capital expenditures on prisons and the expenditures on legal aid, Marks' revised estimates of the expenditures on drug law enforcement in 1987–88 was \$320 million, still only 13% of the total expenditures of \$2,451 million for Police, Courts, and Prisons obtained from Barnard and Withers' (1989) top-down estimates, or a smaller 9.4% of the extrapolated expenditure figure of

3. Robbery, extortion, break-and-enter, fraud and misappropriation, receiving, and other theft.

\$3,387 million from ABS (1992) estimates.⁴

From the *1994 Yearbook Australia*, the total current and capital expenditure of law and order for 1990–91 was \$4,572 million, and so an unchanged 9.4% of this would be \$430 million. Such an increase is not merely from the effects of price inflation: the number of prisoners on 30 June 1991 was 15,021, including 6,534 (or 43.5%) associated with various kinds of theft, and 1,364 (or 9%) associated with drug offences. The numbers associated with theft had risen by 20% since 1987–88.

The Federal Budget Papers reveal that the National Crime Authority's budget rose by 20% per year in real terms over the three years 1987–88 to 1990–91, which resulted in a budget of \$26.9 million in 1987–88 dollars, or \$33.1 million in 1991 dollars. 60% of this corresponds to \$19.9 million.

We adjust the 1987–88 figures for the drug law enforcement expenditures associated with the Australian Federal Police, the Australian Customs Service, the state police and the recurrent expenditures and legal aid expenditures associated with the courts by 30% to reflect population growth and inflation.⁵ We adjust the figures for prisons (recurrent and capital) by 48%, to reflect inflation and the 20% increase in drug-related and theft incarcerations. We use the higher estimate of the National Crime Authority expenditures derived above. The results are presented in Table 2, below.

4. The *1994 Yearbook Australia* (Table 11.1) presents previously unpublished data on Australian law and order expenditure (recurrent and capital) for the three years 1988–89 to 1990–91, which grew from \$3,779 million to \$4,572 million. Extrapolating from the calculated real growth rates of expenditures on police services (1.8% p.a.), courts and legal services (10.0% p.a.), and prisons (3.5% p.a.) over this period back for a year results in a nominal expenditure in 1987–88 of \$1,987 million for police, \$711 million for courts, and \$689 million for prisons. It is not immediately clear how to reconcile Barnard and Withers' figures with those from the ABS. The ABS figures include outlays on police colleges, police training, police laboratories; legal representation and advice on behalf of the government and others, expenditures on crown prosecutions, trustees. They exclude, however, outlays associated with industrial law and tribunals and appeal boards associated with industrial law and tribunals and appeal boards that can be classified to special purpose categories, and residential child-care institutions that are not places of secure detention.

5. This proportion will be excessive for some of these expenditures (such as certain state police forces) and insufficient for others (such as the Australian Federal Police), but is on average appropriate. See the numbers of officers by state police force and the AFP over past years in ABS (1993) Table 11.4.

	\$ million
Australian Federal Police	43.6
National Crime Authority	19.9
Australian Customs Service	9.0
State Police	83.5
Prisons (recurrent and capital)	230.3
Courts (recurrent and Legal Aid)	64.1
Total	450.4

TABLE 2. Estimated drug law enforcement expenditures, 1991–92

The total of \$450.4 million for drug law enforcement expenditures in 1991–92 represents an increase of 40% over the estimates for 1987–88, or a 16.3% increase in real terms. It represents only 9.9% of the ABS (1993) figure of \$4,572 million for total Australian expenditure on law and order, and so is a very conservative proportion.⁶

3. *Cannabis Law Enforcement Expenditures*

What proportion of our estimated expenditure can be attributed to cannabis? The problem is one of distributing costs over a joint production process. We have a range of proportions: seizures (78% of total seizures), value of turnover in the black markets for illicit drugs (73%, according to the Cleeland Report), proportions of the population who have ever used cannabis (91% of all illicit drugs) or who have used cannabis in the past year (87% of all illicit drugs), numbers of arrests by illicit drug (83% for cannabis).⁷ So the choice appears to be between 73% (low, because of the high value of imported black-market heroin and cocaine) and 91% (high, because of the availability of domestically grown cannabis).

In this approach at allocating costs, we tend to the lower proportion. It

6. But not as conservative as that of the Queensland discussion paper, which estimates a notional cost for all drug law enforcement for that state of \$27 million in 1911–92 (ACID 1993, Table 7.18). Pro-rated by population, this corresponds to a figure of only \$155.8 million for Australia, but then, as Marks (1991, Table 2) showed, Queensland had the lowest ratio of drug law enforcement officers to population of any state in 1987–88, only 40% of the New South Wales ratio.

is true that the black-market price for cannabis is nothing like as high as the price for such “addictive” drugs as heroin,⁸ but this is because the demand for heroin, at least amongst the habitual users who consume most of it, is much less elastic than the demand for softer drugs, such as cannabis. The other side of that particular coin is that it is the consumers of “addictive” drugs who commit most of the drug-related theft: the high, black-market prices cannot be met by habitual users from legal sources of income. So a disproportionately small number of drug-related thefts are committed by offenders who have not been using “addictive” drugs. A disproportionately small number of prisoners who have been using legal drugs and cannabis only have committed drug-related thefts. The expenditures on prisons, then, should be more heavily accounted for by heroin and cocaine.

If we take a figure of 73% of drug law enforcement expenditures attributable to cannabis, we arrive at a figure of \$329 million for the year 1991–92. As we remarked above, both the proportion and the base are conservative estimates. But what does such a figure mean? What it doesn’t mean is that if cannabis disappeared (because, say, of a disease that destroyed all cannabis plants in the world) then expenditures on law and order in Australia would soon fall by that amount, since so long as other drugs were in demand but prohibited, officers, courts, and prisons would still be necessary to attempt to enforce the law.

If there were a reduction in the severity of the prohibition against cannabis (such as the South Australian expiation system or the Australian Capital Territory system of on-the-spot fines, see ACID (1993, p.30)) to what extent would the expenditures estimated above fall? Figures in Sutton and Sarre (1992) show two things: first, there was a clear fall in drug-related offences after the law was changed in South Australia in 1987. This is also

7. DHHCS figures show that cannabis seizures were 2,398 of a total of illicit drug seizures of 3,065 in 1991 (Table 65); the Cleeland Report (1989, Table, p.ix) estimates a turnover of \$1,905 million for cannabis in a total illicit drugs turnover of \$2,617 million in 1987–88; DHHCS figures for 1991 show that 32% of Australian have ever tried cannabis and 35% have ever tried any illicit drug (Table 23), and that 13% of Australians have used cannabis in the past year and 15% have used any illicit drug in the past year (Table 25); their figures show 29,209 cannabis arrests and a total of 35,296 illicit-drug arrests in 1991 (Table 64).

8. And, we predict, black-market prices for tobacco, were society foolish enough to attempt to prohibit tobacco consumption, since tobacco is usually regarded as even more “addictive” than heroin.

seen in the DHHCS figures on recorded drug offences.⁹ If a similar fall in absolute numbers had occurred across Australia, the number of drug offences would have fallen by 72,280, or more than the total number of recorded drug offences for the whole country in 1990. A proportionate fall in numbers would have led to a fall of over 70% in recorded drug offences.

Second, Sutton and Sarre report that there was a small or negligible fall in the workloads on South Australian courts in the nine months after the law was changed, since a significant proportion of offenders — 45% — did not pay their expiation bills by the due date. It was concluded that unless significant effort was made to increase the rate of expiations, the impact of the initiative on the courts would not be significant.

These observations suggest that, first, individually reducing the penalties for cannabis, while other prohibited drugs remain for which there are continuing demands and black-market transactions, will not reduce public expenditures by much, if at all. Second, that alternatives such as the South Australian initiative may lead to few if any cost savings in the criminal justice system. There are, however, clear gains to individuals who are apprehended and no longer risk large penalties and the possibility of criminal records, and there will be other reductions in wider social costs.

4. Other Social Costs Related to Cannabis Use.

The earlier research, focusing on heroin use, derived estimates for the wider social costs of mortality and morbidity associated with the use of illicit drugs, and argued (Marks 1991, pp.206–7) that some proportion of these costs was a consequence of the illicit nature of the consumption: especially for injected illicit drugs.

Additional social costs included in the earlier work were the value of lost production from sickness (including AIDS) and premature death, the costs of drug maintenance and rehabilitation programs, and private expenditures to protect households against losses from theft. The value of these losses (“involuntary transfers”) and the transfers from taxpayers to

9. Sutton and Sarre report (p.582) that “rate of police detections of minor cannabis offences continued to rise under the cannabis expiation system ... [but] the rate of increase (11% p.a.) was less than the long-term rate of increase (25% p.a.)” although they doubt a direct link between the detection rate on the introduction of the scheme. In Table 67 the DHHCS (1992) figures show that South Australia had the largest fall in the drug offence rate, from 596 per 100,000 population in 1985 to 178 per 100,000 population in 1988. This occurred mainly with the introduction of the cannabis expiation scheme.

drug users through the social security system were also estimated (Marks 1991, Table 11).

A focus on cannabis use finds little evidence of high additional social costs, flowing from the illicit nature of its consumption or otherwise, despite the strongly held beliefs of some that “cannabis is clearly a dangerous substance leading to a range of physical and psychiatric conditions that should be avoided” (ACID 1993, p.20). The conclusions of many medical researchers are that cannabis is not a dangerous substance, and that, used in moderation, it is physiologically less toxic than many regularly consumed legal substances, such as alcohol and tobacco.¹⁰ The Queensland discussion paper (ACID 1993, pp.20–26) canvasses the evidence pro and con of the pharmacological, physiological, and psychological effects of cannabis use.

Additional social costs include “lack of respect for the institutions of justice; the maintenance of lucrative illicit markets and any attendant organised-crime involvement, violence or corruption; the costs arising from the criminalisation of individuals [users and dealers]; and the foregone (*sic*) value of other uses to which resources currently engaged in drug commerce and drug law enforcement could be put” (ACID 1993, p.96). Our figures above attempt to put a value on the drug law enforcement costs.

5. *Supply and Demand*

5.1 *Supply*

Of concern, given the evident lack of effectiveness of the laws prohibiting cannabis use, is the illicit distribution system, with its unscrupulous entrepreneurs. Given the fact that some proportion — probably large, given the relatively low *value-density*¹¹ of cannabis leaf, which leads to greater risks of detection as the drug crosses national frontiers — of the drug is grown in Australia, the high mark-ups¹² down the distribution chain are a potential temptation to Australian residents to break the law.

The Queensland discussion paper (ACID 1993, pp.58) estimates that,

10. The Queensland discussion paper summarises the findings and recommendations of 25 inquiries here and abroad into the desirability of reforming cannabis laws (ACID 1993, Table 1.1).

11. Dollars per litre of the drug as transported. Cannabis oil and cannabis resin, neither of which is believed to be produced in Australia (AFP 1991, p.11), are more attractive for smugglers, given their higher value-densities.

using a conservative average yield of 500 grams of cannabis per plant, Queensland's annual consumption of cannabis (40.5 tonnes, by 83,600 frequent regular users, at a street value of \$361.6 million) could be satisfied by about 81,000 mature plants per year. But Queensland police seize on average 40,000 to 50,000 plants annually without any discernible market effect, which implies a much larger crop.

The discussion paper argues that Queensland supply might be significant in Australia,¹³ with three-quarters of the state's crop meeting out-of-state demand. If these conclusions are correct, then the Queensland cannabis industry is worth \$632.8 million (at retail prices of around \$9 per gram and an annual crop of 70.9 tonnes) or \$283.6 million (at wholesale prices of around \$4,000 per kg), comparable with the values of the commercial sugar and wheat crops in Queensland.

The discussion paper examines (p.61) the relative sizes of the home-grown crop and the "commercial" crop by analysing prosecutions for cultivation: cultivations of ten or fewer plants accounted for 72.5% of offences, but only 6.2% of total plants seized. This suggests that casual growers are not significant suppliers. Of more concern is the network of supply, including the "commercial" growers.

The discussion paper's investigations corroborate Marks' (1990) analysis of the illicit heroin distribution network, at least in its lower, Australian levels. From the top, a smaller number of criminal/large-scale growers, then a larger group of medium-scale/regional growers with smaller plantations, then a large number of cannabis consumers, some of whom are user/growers and user/dealers. The local, Queensland networks may be separate from the national networks, with the consumers away in the southern states.

As discussed above, despite significant seizures of foreign cannabis arriving in Australia and detection and destruction of apparently large

12. The Queensland discussion paper gives one example in which the ounce-dealer made a gross return — sales/purchases — of 215%, and the "hotel dealer" (selling "sticks" or "foils") a gross return of 200% (ACID 1993, Table 6.1). It is likely that the returns to growers are even higher, given the risks of detection of large-scale plantations.

13. Four reasons: (a) a tightening of drug law enforcement in the southern states, especially New South Wales; (b) more favourable growing conditions, especially in far north Queensland; (c) market perceptions that Queensland cannabis is more potent than southern crops; and (d) the presence of established criminal networks with southern market connections.

Australian plantations, there has been little if any effect on the supply of the drug, as reflected in stable street prices. This is the strongest evidence for the resilience of the supply side of this black market in the face of determined law enforcement. How the supply network would adjust to changes in the laws relating to cannabis possession and use, *ceteris paribus*, remains to be seen, but a fall in profitability, with no change in the risk of apprehension might be expected to make supply of the drug less attractive to the unscrupulous entrepreneurs.

5.2 Demand

As noted above, the price elasticity of demand¹⁴ for cannabis is higher than for more “addictive” drugs such as heroin, which means that there is less pressure on would-be cannabis consumers to commit property crimes to pay for their drug, with correspondingly lower black-market prices. But a more highly elastic demand means that a lower price will result in a larger demand for the drug, although, given the relatively benign effects of cannabis on the user, this should not be of concern, except to those who would prohibit its use at any social cost.

What does the South Australian initiative suggest the effect of reducing the penalties for cannabis possession and use — and hence the black-market price — would be? Sutton and Sarre (1992, p.583) present figures which suggest that, despite the easing of controls over cannabis use in South Australia since 1987, there has been no significant rise in the numbers of cannabis users, at least among high-school pupils.¹⁵

6. Policy

Benson and Rasmussen (1991) argue that a crime-control policy focusing on drug crime will not serve as an effective means of controlling property crime, because increased drug law enforcement efforts, with fixed budgets for law enforcement, will reduce the risk of apprehension for those who commit property crimes, which in turn may increase the incidence of property crimes, including those that are drug-related. This suggests that cannabis law

14. Measured by the percentage fall in demand in response to a 1% increase in price, *ceteris paribus*.

15. The proportion of South Australian secondary school pupils who report using cannabis on a weekly basis remained stable at less than 6%. About 20% of pupils reported ever having used cannabis, again a stable figure. The South Australian figures are similar to those from New South Wales (DHHCS 1992, Tables 45 and 48).

enforcement efforts may be counterproductive, when the aim is to reduce overall levels of criminal behaviour. Indeed, the evidence presented above suggests that such efforts are quite ineffective at preventing use of cannabis in Australia, but are expensive for the community, both in terms of public expenditures and of non-monetary costs.

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