Lecture 2

The Cost of Crime in Canada
(I have included a few new numbers and data that are in process of being developed for 2008.)

The cost of crime is important for any number of reasons.

First, the cost of crime has three distinct components: the cost to the victim of criminal acts; the cost of denouncing and punishing criminal acts, and the cost of deterring anticipated criminal activity. Punishment and prevention flow from the damage that bad acts cause. Thus there is an asymmetry in measuring the cost of crime as the damage to the victim underlies the entire edifice of what is associated with the cost of crime since how much prevention and how much incapacitation or denunciation depends at least in part upon the perceived harm the bad acts cause.

While we would all like to live in a crime free society, since there are costs associated with the punishment and prevention of crime, the outcome for society is a balance of the benefits associated with prevention and punishment with that of their costs. Thus our assessment of the cost of crime to the victims of crime gives weight to case for punishment and prevention and helps establish how much we are willing to spend to enforce the criminal law.

One way to express the cost of crime is to identify components that are associated with the final processing of crime: the cost to the victims; to cost to catching the perpetrators; the cost to punishing.

We might think of expressing the cost of crime in Canada, C, as:

$$C = vS + wP + bx\pi S$$

Where **v** is the valuation victims put on the supply of crimes, **S**, **w** is the wage paid to those, **P** (police), who are catching criminals, **b** is the daily cost of incarceration or punishment (more generally), **x** is the duration of the sentence in days, and **π** is the probability that the perpetrator will be caught. Think of this as a schematic since each part can be expanded in more detail.[1] In what follows we will deal first with v, then talk about S.

The cost to the victims

In one way this is the most obvious and also the most difficult of tasks. We can clearly see the costs associated property crime such as with a theft of something: a car, a purse or an iPad. More difficult is to recognize how our behaviour changes in response to the

[1] We can imagine there being many crimes, S_i, each of which has different costs associated. We can imagine policing as being for all crimes or for particular crimes. The level of detail is interesting and endless.

threat of crime: we buy locks, home security systems, dogs, insurance. More difficult still is the trauma associated with the criminal event. Anyone who has been broken into, or has had significant things stolen will understand the sense of violation and anger that accompanies the discovery of the theft. Do such feelings have value? Of course they do, but measuring that value systematically is remarkably difficult.

The cost to violent crime can be subtle as well. On the one hand if we are confronted with someone who is about to hit us over the head with an iron bar, we recognize that we would pay anything to prevent this event. Yet, in fact, we typically accept a certain level of risk while going about our daily activities. Many of us drive to work even though we know there are 2,400 deaths a year (in 2008) attributable to driving.

We place a value on our lives and our limbs and other injuries even though we do not necessarily recognize it. For example, let us consider the value of a life. There are a number of ways of valuing a life. First, some may argue that it is infinite. This may be a reasonable view to some, but it is clearly not a generally held position. If we accepted this idea then it would not make sense to drive. That is, the finite probability of an infinite loss is still infinite and you would not do it. Second, we may want to value a life by assessing the contribution that person made. In the economic context this might mean measuring the value of a person's output: the output that was lost through their death. The problem on the face of it is that we might want to also take into account their consumption. Thus the final measure of the value of a person's life would be of the difference between production and consumption: what we term the bequest or unconsumed output. There are other possible 'economic' measures.[2] But all of these calculations leave us uncomfortable since we are projecting value with little consensus on what is appropriate for the individual in question.

Perhaps a more sensible way to value someone's economic life is to ask how the person themselves value it. This approach gives rise to what is termed the statistical valuation of life: SVL. The basic tenet of this approach is to measure the wage that is paid to a worker as a function of the usual inputs to the earning function: the education, experience, marital status, etc., and include a variable for the riskiness of the activity for which the worker is being paid. Typically this includes the probability of death and the probability of injury. The wage equation is typically estimated as:

$$\ln W = a_0 + a_1 EDUCATION + a_2 EXPERIENCE + \ldots + a_r RISK$$

The compensation for the risk of death, $\mathbf{a_r}$, is measured as an increment to the wage.[3] That is, to induce people to work at it, a riskier job will require a higher wage.[4] The

[2] For example, we might measure the extent to which one person raises the productivity of others, or we might ask a jury using their own assessments to assign a value to life and limb.

[3] More precisely, $(\Delta \ln W/\Delta R)=a_r$ is the percentage change in the wage occasioned by an increase in risk.

[4] This is once side of the story that depends on a worker's taste for risk. On the other side of the story is the combination of risk and wages that is on offer by firms. Equilibrium in the market is characterized by equating the marginal cost of risk by firms to the marginal cost of risk by workers. Good discussions of this can be found in Rosen() who developed the theory of "hedonic" pricing for risky markets, and Viscusi() who has developed a myriad of sophisticated applications of the basic approach. The

statistical valuation of life is then constructed by taking the increase in the wage and multiplying it by the number of hours worked. The calculation can tell us how much we need to be compensated for incurring the risk associated with the job.[5]

Recent research into Canadian SLV suggests that a life is worth about $5 million. That is, a group of workers will require a wage premium worth about $5 million to accept the probability that one additional worker will die.

This calculation is suggestive. We do not have a natural way of evaluating the deaths associated with crime. On the one hand, some who are killed are voluntarily engaged in a very risky lifestyle: think of the murders of various gang members plaguing Vancouver recently. On the other hand, some innocents are also killed. Our approach has been to value life at the average of the workforce.

Since there have been 610 homicides in 2009, the cost of this crime is set at: $3.05 billion.[6]

Valuation of Injury from Crime

Although we have a measure of the value of injury associated with on the job activities, there is no simple way to relate this to injuries associated with being a victim of crime. To value these injuries we turn first to the measures of cost associated with medical interventions.

Victim's services provided about $324 million to victim's of crime.

Looking at the cost of assaults, a large category of crime, we (E&F, 2012) find that courts are willing to make awards of the following kind:

Variable	Value $
Assault 1	6,497
Assault 2	18,348
Assault 3	179,645
Sex Assault 1	13,870
Sex Assault 2	77,946

fundamental difficulty is deciding how to recognize that some workers are more risk tolerant than others and will tend to select into risky activities.

[5] There are a host of important questions that deserve attention to develop the measure of SVL. These include things like the awareness of workers to risk, the relevant level of risk in an activity – some workers may be exposed to more risk than others at the same job, etc.

[6] We are drawing the line here by not including the damage to others associated with death or injury. Obviously people around the victim are also affected. We consequently will tend to underestimate the cost of homicide if , on average, the victims are well regarded. See Easton and Furness (2012)

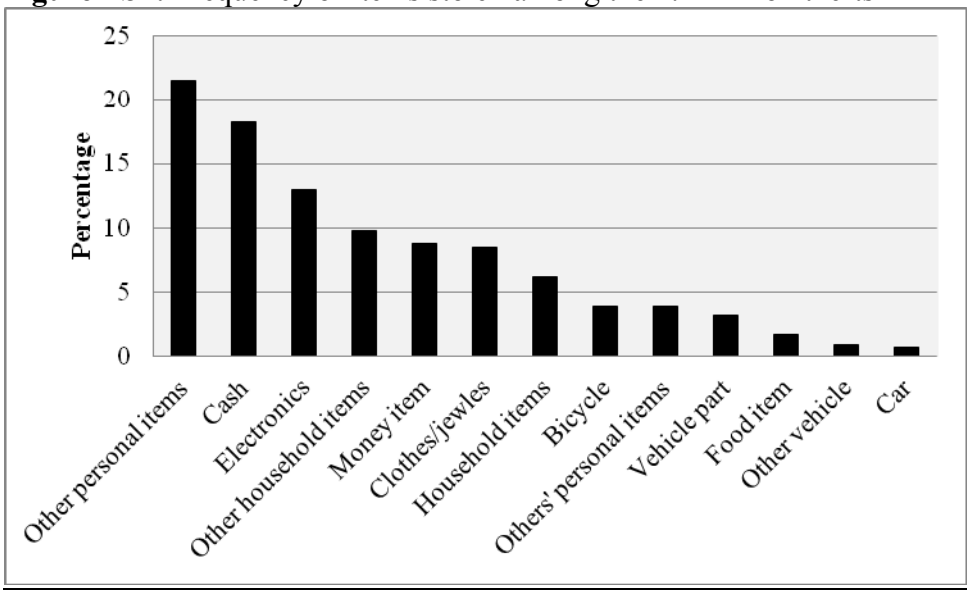
Sex Assault 3	116,509

These awards include compensation for pain and suffering as well as recompense for injury. Looking at the numbers of the various assaults

Valuation of Thefts

Data from the GSS suggests that 1.4 million individuals had property worth $2.8 billion stolen. Some of this was insured, but if the insurance was 'fair' in the sense that the premium reflected the cost of what was stolen, the property owner's cost is equal to the value of the thefts. Among other things, these thefts included roughly 230,000 bicycles, 755,000 electronic items, 42,000 cars, and 51,000 other vehicles. Some 404,000 additional individuals reported that there was an attempt to steal their goods. Figure PS1 describes the frequency with which some of the more common goods were stolen.

Figure PS1: Frequency of items stolen among the 1.4 million thefts



Source: GSS Cycle 23 – Victimization (look to do file "Property stolen-damaged cost analysis (adjwtvic)" and Excel file "Property stolen-damaged cost analysis (adjwtvic)"

In addition to thefts, criminal activity also inflicts damage. Some 864,000 people had property damaged but not stolen.. The total cost of the damage is estimated to be $1.5 billion and the expected value of the damage (per victim) is $646.

Policing in Canada

There are several parts to the cost of policing in Canada. The most basic is the cost associated with the police forces around the country. In 2009 there were 67,085 police officers and 26,999 civilian servants employed These figures suggest there were 198.8

police officers per 100,000 and 80 civil personnel per 100,000. Total cost was $12.32 billion.

Courts

Canadian courts are both provincial and federal. The cost of the court system is harder and harder to get. In the past there were useful statistics on the costs, but the data that we have are generally rather dated.

The Charter of Rights and Freedoms (speculative)

The changes in the interpretation of the law have given rise to changes in criminal court proceedings. Many of these flow from a judicial interpretation of the Charter of Rights and Freedoms. These include the right of the accused to see *all* of the Crown's data, the number of warrants required for surveillance and entry to a suspect's residence, and the requirement that there be a speedy trial for the accused. These changes cause a multiplicative increase in the cost of administering criminal justice. They impose costs on the prosecution and the defense, however, since much of the cost of the defense rests with the taxpayer, the public needs to be fully informed of the changes that have shaped criminal justice. Higher costs of prosecution lead to a reduction in the number of cases prosecuted terminating some cases that were previously brought to trial. This adds an additional cost to society.

Severity

In Canada the current measure of crime severity focuses on the sentence length given to the average crime of a certain type.[7] From the perspective of our cost of crime, the police are trying to create a measure of **v**. Thus instead of measuring, **S**, the number of crimes, they are moving toward a measure of the (negative or cost) value of crime. Our discussion suggests that there are other ways to value than solely by *judicial assessment* of the penalty for the crime in law. However, the severity of the crime has to do with the damage done to the victim and the full cost to society of the bad act. The cost to society presumably includes the *cost of the actual punishment* as well as *the process of catching*

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[7] "**Crime Severity Index:** The Crime Severity Index (CSI) not only takes into account the volume of crime but also the seriousness of crime. In the calculation of the CSI, each offence is assigned a weight, derived from average sentences handed down by criminal courts. The more serious the average sentence, the higher the weight for that offence. As a result, more serious offences have a greater impact on changes in the index….The base year for the CSI is 2006, with an Index of "100"."from Juristat()

and prosecuting the bad act. In other words, even if the full punishment is proportional to the number of days in jail or other measures of judicial sanction, this penalty to the perpetrator is only a part of the full cost of the bad act from the perspective of the society that is paying for the criminal's entire experience. If the perpetrators of some crimes are more difficult (expensive) to catch, then the weight in terms of social cost should be higher.