Longitudinal Evidence on the Impact of Victimisation on Labour Market Outcomes and General Well-Being[*]

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Abstract

This paper examines the impact of being a victim of violent or property crime on labour market outcomes and general well-being using longitudinal data from the nationally representative Household Income and Labour Dynamics of Australia survey. We estimate OLS regressions on the entire population and fixed effects regression models that examine changes in outcomes for individuals before/after victimisation relative to changes in outcomes over time for non-victims. The fixed-effects model allows us to control for characteristics that may simultaneously cause certain individuals to be victims of crime and put them at higher risk of poor outcomes. Our results indicate that there is no causal impact of victimisation on employment or income. In contrast, there is strong evidence of a negative impact of victimisation on well-being measures, and these are especially strong for violent victimisation. However, these effects appear to be short-lived.

I.   <u>Introduction</u>

Criminal activity imposes significant costs on society. Government expenditures on the criminal justice system are sizeable in most OECD countries.   These expenditures generally comprise crime prevention, detection and investigation, judicial processes and dispute resolution, prisoner and offender management, and rehabilitation services. In addition, crime victim compensation schemes offer direct reimbursement to, or on behalf of, a crime victim for statutorily identified crime-related expenses such as medical costs, funeral and burial costs, mental health counselling, lost wages or loss of support. These costs, together with private outlays on crime prevention measures, are a measure of the direct cost of crime.

The direct, dollar cost grossly understates the real cost of crime to society since many private precautionary expenses against crime and public expenditures incurred in enforcing certain types of legislation are not included (Becker, 1968). Furthermore, police crime statistics understate the incidence of crime, largely because many crimes are not reported. Moreover, as Viscusi (1993) suggests, health and safety risks contribute to human unhappiness. One possible source of health risk, in addition to physical injury, is the post-traumatic stress and the psychological impact of injury on its victims. These effects can be relatively short-lived or can 'activate long-term trajectories of mental distress' (Macmillan, 2001). However, it is generally impossible to put an accurate price on the emotional and psychological sufferings caused by victimisation. Finally, as Rizzo (1979) points out, in the presence of risk aversion, the true cost of crime will exceed the expected value of losses.

Research on crime by economists has focussed on trying to explain individuals' decision to commit crime within an optimization framework, on analyses of public policies to mitigate criminal behaviour and on the economic consequences of incarceration for individuals. However, they have largely ignored the impact of crime

on victims. This is surprising, given the level of interest in the impact of other life-changing events like divorce and unemployment. The need for accurately estimating both the direct and indirect costs of crime cannot be over-emphasised. Crime has the potential to incapacitate otherwise productive people, and to impose financial and psychological costs on their families. These are costs that are ultimately borne by society.

In this paper, we estimate the causal effect of crime victimisation on labour market outcomes and general well-being using longitudinal data from the nationally representative Household Income and Labour Dynamics of Australia (HILDA) survey. Crucially for our analysis, individuals in HILDA are asked whether they experienced a number of major life events in the previous year including being a victim of violent or property crime. We have four waves of data available, which allows us to only estimate short-term impacts. But the richness of the data allows us to extend the literature in a number of ways.

First, we estimate OLS regression models on the entire population and fixed effects regression models that examine changes in outcomes for individuals before/after victimisation. We can estimate fixed effects regressions because HILDA collects longitudinal data on a representative sample of both victims and non-victims, unlike the administrative data typically used in this literature. This allows us to control for characteristics that may simultaneously cause certain individuals to become victims of crime and put them at higher risk of poor outcomes.

Second, we estimate the impact of victimisation on both labour market outcomes and general well-being. Clearly, victimisation might have impacts on individuals beyond the labour market. We believe that this is the first quantitative analysis to examine the impact of victimisation on more general measures of human capital and personal well-being.

One strand of the literature on happiness deals with the question of hedonic adaptation to life events. The main research question in this area is whether individuals adapt to 'utility shocks' such as divorce, unemployment, becoming disabled etc. There are three main findings arising from this research: (1) while people react strongly to life-changing events, on average, they eventually return to their initial (pre-event) levels of well-being or life-satisfaction; (2) but there is considerable heterogeneity in the rate at which individuals return to their baseline satisfaction levels; and (3) men and women vary in their response to specific life events.

Our results indicate that there is no causal impact of victimisation on employment or income; while estimates based on cross-sectional models indicate significant impacts, the fixed-effects estimates uniformly suggest that these results can be explained by unobserved heterogeneity. In contrast, there is strong evidence of a negative impact of victimisation on well-being measures, and these are especially strong for violent victimisation. However, these effects appear not to persist beyond the first year following victimisation. We relate our results on well-being to findings from the happiness literature dealing with habituation.

The rest of the paper is organised as follows: Section II reviews the relevant literature. Section III provides contextual details by reviewing recent crime trends in Australia. In Section IV, we describe the data and provide some descriptive statistics, while in Section V, we describe the empirical methodology that we adopt in this paper. Section VI presents the results, and Section VII concludes.

II.   **Related Literature**

Research on criminal victimisation by sociologists and criminologists burgeoned after the advent of crime victimisation surveys, especially in the United States

(Sampson, 1987).[1] The micro aspects of this literature examine variation in the risk of victimisation with the characteristics of individuals on the one hand, and the psychological consequences of victimisation on the other. From a more macro perspective, this literature investigates how rates of victimisation vary with the characteristics of neighbourhoods, and the socioeconomic impact of crime on neighbourhoods (Jarjoura and Smith, 1989).

Individual-level studies examining the characteristics of victims reveal that rates of victimisation are highest among males, young and unmarried individuals. This is consistent with findings from crime victimisation surveys. There is also compelling evidence that crime victims suffer psychological trauma following the incident. The intensity and duration of these effects vary with the characteristics of the victim and the nature of the crime. For instance, Freedy *et.al.* (1994) examine the incidence of post-traumatic stress disorder (PTSD) among recent victims and their family members involved in the criminal justice system in the U.S. during the late 1980s. They find a high prevalence (over 50%) of PTSD among their respondents, with victims of violent crime being more at risk of suffering psychological damage. Macmillan (2001) suggests that since victims of violent crimes tend to be young and since victimisation has an acute psychological impact, at least in the short-run, these incidents have a life-altering effect on young victims.

Increasing economic inequalities in the 1970s led to spatial segregation along racial lines in U.S. cities, resulting in concentrations of poverty (Wilson, 1987). The racial underclass theory of crime argues that the gradual migration of middle-class and working-class African Americans from inner city areas to suburban

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[1] Most industrialised countries and many developing countries now rely on these national victimisation surveys to provide information on crime, independent of police statistics. The information includes rates of victimisation, variations in rates of victimisation among segments of the population, the percentage of crimes reported to police, reasons for not reporting, fear of crime and perceptions of safety, and efforts undertaken by individuals to protect themselves from crime.

neighbourhoods left the most economically marginalised racial minorities behind. According to Wislon (1987), this ghettoization is the result of the failure of public policies to combat poverty and is the source of the increased incidence of crime. This theory implies that the poor, inner-city residents in urban areas are more at risk of victimisation relative to the rich.

Relative deprivation theory of crime suggests that crime increases with economic inequality, and is not related to poverty *per se*. Blau and Blau (1982), for instance, find that neither race nor poverty explain differences in urban crime rates across the U.S., once inequality is controlled for. Levitt (1999) also finds a strong relationship between income inequality and incidence of crime. He analyses the relationship between race, income inequality and crime victimisation in the U.S. from the 1970s to the 1990s. This was a period of rising income inequality in the U.S. He finds that while property crime became more concentrated among the poor over this time period, the rich are now much more likely to become victims of violent crime.

Levitt's (1999) results are also consistent with the routine activities/lifestyle theory of crime, which hypothesises that social differences in crime victimisation can be explained by differences in routine activities which put certain individuals at closer proximity to offenders and increase their risk of victimisation. For instance, Miethe and Stafford (1987), analysing survey data measuring the quantity and nature of daily routine activity in thirteen cities in the U.S., find that these variables are strong predictors of property victimisation but not of violent victimisation.

Another strand of the literature suggests that neighbourhood characteristics predict victimisation risk, independent of individual characteristics such as age, race, sex, income, and marital status. Sampson (1985) finds that structural density, residential mobility, and female-headed families have strong positive effects on rates of personal victimisation. He also finds that inequality and racial composition have

negligible effects on victimisation when family structure, residential mobility and neighbourhood density factors are accounted for. These findings are consistent with an opportunity model of predatory victimisation.

Our reading of the literature suggests that there are a few exogenous individual chractersitics that are good predictors of victimisation. Nevertheless, there is considerable unobserved heterogeneity in the risk of victimisation.

In this paper, we attempt to add to the micro aspects of the victimisation literature. The dataset we use in this paper has a rich set of variables that will allow us to control for sociodemographic and neighbourhood characteristics in estimating the impact of victimisation on our chosen outcomes. To our knowledge, this is the first economic analysis of the impact of victimisation on labour-market outcomes and subjective well-being.

Happiness literature

III.   Crime in Australia – Recent Trends

Australia ranks high among developed countries with regard to both victimisation rates and incarceration rates.[2] The International Crime Victimisation Survey (ICVS), conducted periodically by the United Nations interregional crime and justice research institute (UNICRI), is a standardised survey across countries dealing with individuals' experience of crime. The first ICVS was conducted in 1989, with subsequent surveys carried out in 1992, 1996, 2000 and 2004. In a report based on 17 industrialised countries surveyed in the 2000 ICVS, Australia ranked in the group of countries with the highest rates of overall victimisation.[3]   Table 1 reports these findings.[4]

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[2]   Victimisation rates are prevalence rates that count the percentage of people or households victimised at least once.
[3]   The other countries in this group were England and Wales, the Netherlands and Sweden, all with victimisation rates over 24%.

Specifically, Australia ranked high in the list for victimisation related to burglary, personal theft and contact crime, including sexual assault.[5]

Thus, Australia does not compare very favourably with other developed countries in terms of crime statistics. However, internal trends over time show considerable improvements; figure 1 traces rates of violent crime between 1996 and 2004.[6] While the trend in the rate of recorded assault has shown a sharp increase from 1996 to 2003, other forms of violent crime either show a more gradual upward trend or a declining trend since 2001. However, there is a discernible decline in the violent crime rate in 2004. Property crime shows an increasing trend between 1996 and 2001 (Figure 2) but has declined thereafter.[7]

Some of the decline in crime could be a consequence of recent trends in incarceration, reflecting a tougher policy towards offenders. Table 2 presents incarceration rates over time for selected countries. While the USA is a clear outlier, Australia features in the group of countries with relatively high incarceration rates. Statistics reported by the Australian institute of Criminology suggest that overall prison population has grown at an average annual rate of 5% since 1984. Most of this increase reflects imprisonment for violent crimes.[8] The rate of increase was high in the 1990s, but has slowed down since 1999.

IV.   Data

We examine the impact of victimisation using longitudinal data from the nationally representative HILDA survey for the years 2002-2005. This survey began

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[4]   Changes in rates of recorded crime may be the result of changes in the way crime data are collected, or changes in the proportion of victims reporting criminal offences to police. Thus, differences in crime rates across countries are not necessarily an indicator of differences in actual levels of crime in those countries.
[5]   See also Leigh (2004).
[6]   Violent crime comprises homicide, assault, sexual assault, robbery and abduction.
[7]   Property crime comprises burglary, motor vehicle theft (MVT) and other theft like pick-pocketing, bag snatching, shoplifting and bicycle threat.
[8] The percentage of prisoners sentenced for violent offences increased from 38% in 1986 to 47% in 1995 and remained steady thereafter (Australian Institute of Criminology 2006. Australian crime: facts and figures 2005).

in 2001 and has since been administered annually. HILDA interviews all adult members (aged 15 and over) in over 7,500 sample households and collects information about economic and subjective well-being, labour market dynamics and family dynamics.[9] Individuals in sample households are followed over time regardless to whether they remain in the original households. Four survey instruments are included in HILDA: a Household Form and a Household Questionnaire are completed during a personal interview with one adult member of each household; a Person Questionnaire is administered to all adult household members; and a Self-Completion Questionnaire (SCQ) is provided to all respondents to the Person Questionnaire and is collected at a later date or returned by post.

The SCQ elicits subjective responses to an array of sensitive questions, such as alcohol use and life satisfaction. Starting in the second wave (2002), the following question was added to the SCQ, "We now would like you to think about major events that have happened in your life over the past 12 months. For each statement cross either the NO box or the YES box to indicate whether each event happened during the past 12 months. If you answer "YES", then also cross one box to indicate how long ago the event happened or started." Twenty-one major events are then listed below the question. Two of these statements are: "Victim of physical violence (e.g., assault)" and "Victim of property crime (e.g., theft, housebreaking)", and these are the events that we focus on in this paper.[10] Unfortunately, we are provided with no further details about the crime committed or the kind of compensation, if any, received. This lack of contextual detail is an obvious weakness of using HILDA to examine the impact of victimisation.

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[9] The survey utilises a multi-stage sampling approach (sampling households within Census Collection Districts) and is stratified by State and part-of-State.
[10] Other examples include "Pregnancy / pregnancy of partner", "Death of a close friend", and "Promoted at work".

Pooling the four years of survey data provides a sample of 15,979 individuals and 50,936 observations. For obvious reasons, we need to drop all observations in which an individual fails to complete a SCQ or fails to answer the question on whether or not they have been victims of crime in the previous year (5,566 observations, 946 individuals). We also drop a small number of observations where individuals fail to report their aboriginal status or education in a particular year (18 observations, 8 individuals). This leaves us with a main analysis sample of 15,025 individuals and 45,352 observations. A further 2,668 individuals are in our analysis sample for only one year and thus are dropped when estimating fixed effects regression models.

Out of the main analysis sample, 2,603 individuals (17%) report having ever been victims of crime during the four years of the sample, with 1,969 of these individuals having been victimised once and 634 victimised multiple times, for a total of 3,424 events. The probability of being victimised declines over the four-year period, with 0.88% of individuals (1,003 people) in 2002 reporting being victimised in the previous year, 0.84% (967 people) in 2003, 0.70% (782 people) in 2004 and 0.60% (672 individuals) in 2005. This is true for both violent and property crime.

Table 3 presents summary statistics for individuals, stratified by whether they have ever been victimised. The first set of variables comprises the outcomes for which we examine the impact of victimisation. There are notable differences in the characteristics of victims depending on the nature of crime. Compared to non-victims, victims of violent crime have lower employment rates, lower labour, non-labour and household incomes.[11] As discussed above, these differences may merely reflect the fact that victimised individuals are also more likely to have poor labour market

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[11]   Employment status measures whether the individual is currently employed, (conditional) hours worked measures hours worked in the last week (conditional on being employed), hourly wages are earnings in the last week divided by hours worked in the last week for all wage/salary workers, benefit receipt measures whether an individual receives income from any government benefit, total annual income is the summation of all income sources for the individual in the last year, and total annual household income is the summation of all income sources in the last year for all household members. All wage and income measures are in 2001 Australian dollars. Hours worked are winsorised at the 99th percentile and hourly wages at the 1st and 99th percentile to reduce the impact of obvious measurement error.

outcomes. Property crime victims, in contrast, have better economic outcomes on average, relative to non-victims. While they compare unfavourably with non-victims with regard to self-reported health, life satisfaction and satisfaction with family relationships, they do considerably better than the victims of violent crime in these subjective measures.[12]

Next, we examine the age profile of victims. Crime victims tend to be younger than non-victims, on average, with victims of violent victimisation being 6 years younger than property crime victims. Prime-age individuals (ages 25-54) have the highest victimisation rates. The risk of victimisation declines sharply for older individuals.

Table 3 also reveals considerable differences in individual and household demographics and local neighbourhood characteristics among victims and non-victims on the one hand, and between property crime and violent crime victims on the other. Individuals who have been victims of violent crime are more likely to be male, less educated, more likely to be Aboriginal or a Torres Strait Islander, less likely to be immigrants or to be married, and are more likely to live in lower quality neighbourhoods as measured along a whole host of dimensions.[13] The fact that individuals who have been victimis of violent crime differ on numerous observable dimensions from those that have never been victimised, and that a number of these

[12] The SF-36 questionnaire collects data on eight health domains: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. Index scores are created for each domain by transforming the appropriate questions from among the thirty-six. These indexes are scored 0-100, with 100 representing perfect health on each index. HILDA asks a general question on each individual's overall life satisfaction. Another question asks how satisfied or dissatisfied each individual is with a number of personal relationships. We calculate the mean response across all of the following relationships which are applicable to the individual: i) their relationship with their partner, ii) their relationship with their children, iii) their partner's relationship with their children, iv) how well the children in the household get along with each other, v) their relationship with their parents, and vi) their relationship with their (most recent) former spouse or partner. Each of these measures is asked on a 0-10 scale with a 0 indicating an individual is totally dissatisfied and a 10 indicating they are totally satisfied with their life or relationships.

[13] HILDA asks individuals a number of questions about their neighbourhood. We examine each individual's opinion on the frequency of the following events in their neighbourhood: traffic noise, noise from airplanes, trains or industry, homes and gardens in bad condition, rubbish and litter lying around, teenagers hanging around, people being hostile and aggressive, vandalism and damage to property, and burglary and theft. These questions are asked on a 1-5 scale with a 1 indicating that an event never happens in their neighbourhood and a 5 indicating that an event is very common.

dimension (for example, being Aboriginal or a Torres Strait Islander, being less educated) are associated with worse labour market outcomes suggests that negative selection may explain some/all of the differences in outcomes noted above.[14]

Property crime victims present a different profile compared to victims of violent crime. Women are as likely as men to be victims of property crime. Victims of property crime are as likely as non-victims to be Aboriginal or Torres Strait islanders and to be Australian-born. Relative to non-victims, property crime victims are more educated. However, they are similar to victims of violent crime in that they are less likely to be married and more likely to report living in poor-quality neighbourhoods. Relative to non-victims, on average, victims of both types of crime live in major cities.

Consistent with the trends in Figures 1 and 2, successive waves of the survey indicate a decreasing trend in both types of crime. There is a higher incidence of violent crime among property crime victims than vice versa. However, some of this is an artifact of the higher incidence of property crime relative to violent crime.

V. Econometric Model

We now turn to estimating an econometric model of the impact of being victimised on labour market outcomes and general well-being.[15] Following Grogger (1995), we estimate a distributed lag model, thus allowing victimisation to impact current and future labour market outcomes. The model is specified as follows:

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[14]   In the next section, multivariate models of the likelihood of ever being incarcerated will be estimated and discussed.

[15] Although we interpret the results in terms of the impact of having been victimised, it is worth emphasising that we are actually measuring the impact of *reporting* having been victimised. Given the nature of the event, it is reasonable to assume that victimisation may be under-reported or over-reported. However, our results will be unbiased as long as the likelihood of reporting being victimised conditional on having actually been victimised is not systematically related to the examined outcomes. It is difficult to know apriori if this is likely to be the case, but it is difficult to tell a compelling story on why the likelihood of reporting this event would be related to any particular outcome.

$$y_{it} = \sum_{j=0}^{2} X_{it-j} \mathsf{b}_j + Z_{it}\mathsf{d} + e_{it}$$

where y_{it} is one of eleven outcome measures for individual i at time t, X_{it} is an indicator variable which equals 1 if individual i reports having been victimised in the previous 12 months when interviewed at time t and equals 0 otherwise, Z_{it} is a vector of control variables including gender, whether the individual is Aboriginal or a Torres Strait Islander, educational status, country of birth, marital status, number of children aged 0-15 and 16-20 in the household, number of adults in the household, and indicator variables for the year, urban living status, and geographical location of the household, and e_{it} is a random error term.

Given that the risk of victimisation varies widely across age-groups, as indicated in Table 2, we estimate the impact of victimisation separately for 15-24 year olds, 25-54 year-olds and for those aged 55 years and over. Since we use only four waves of data, we can only identify the short-term effects of victimisation. In particular, the coefficients β_0, β_1 and β_2 indicate the current impact of being victimised in the previous year, the current impact of having been victimised two years ago, and the current impact of having been victimised three or four years ago, respectively, on a particular outcome.[16]

First, we estimate this model using ordinary least squares (OLS) estimation methods.[17] If the error term, e_{it}, is uncorrelated with the vector of variables indicating whether an individual has been victimised in the current or previous years, X_{it}, then OLS will provide an unbiased estimate of the impact of being victimised on each outcome.[18] In other words, if after controlling linearly for the observable

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[16] It is worth noting that the impact of having been victimised two years ago is only identified from the outcomes for individuals victimised in the previous year in 2002 and 2003 and the impact of having been victimised three or four years ago is only identified from the outcomes for individuals victimised in the previous year in 2002. Thus, if the impact of being victimised changes over this time period, these results will be confounded. We do not suspect that this is likely to be an issue over such a short time period.

[17] This implies using linear probability models (LPM) when the outcome variable is binary.

[18] When estimating OLS models and the matching models discussed below, we calculate Huber/White robust

characteristics in Z_{it}, the likelihood of being victimised is uncorrelated with an individual's unobserved characteristics and with a particular outcome, then the estimated OLS impact will be unbiased. One shortcoming of estimating an OLS model is that we need to make strong parametric assumptions about the relationship between the observables and the likelihood of being victimised.

We re-estimate equation (1) including individual fixed effects. We now assume that the error term, e_{it}, can be decomposed into two components:

$$e_{it} = a_i + u_{it}, \tag{2}$$

where α_i is an error-term, specific to each individual and invariant over time and u_{it} is a standard white noise error-term. Fixed effects estimation will be unbiased even if α_i is correlated with the X_{it} vector, eg. if fixed unobserved characteristics of the individual are correlated both with the likelihood of being victimised and with particular outcomes. The results from this model can be interpreted as measuring changes in outcomes for individuals before/after victimisation relative to changes in outcomes over time for non-victimised individuals. While fixed effects regression models are unbiased in the presence of observed and fixed unobserved individual heterogeneity, they are less efficient than OLS if fixed individual unobserved heterogeneity is not present. They also exacerbate measurement error bias, making it increasingly likely that the results will be small in magnitude and insignificant.

VI.   **Results**

We begin by examining whether being victimised has an effect on five key econmic outcomes: employment, benefit receipt, labour income, non-labour income and total household income in the last year. The income variables are in real values and measured in logarithmic scale. Table 3 presents estimates of β_0, β_1 and β_2 from the

standard errors that account for the fact that each individual is observed multiple times and their error terms are likely to be correlated over time. Thus, the OLS estimates are also efficient.

OLS and fixed effects estimations for individuals aged 15-24 years. The top panel presents results for violent crime victimisation. First, we examine the OLS results. Controlling for covariates, being a victim of violent crime significantly reduces the likelihood of being employed by about 11% in the first year following the incident and by about 5% if the incident occurred two, three or four years ago. Only the first year impact is precisely estimated. The likelihood of receiving benefits significantly increases by 14% for each of the two years following victimisation. There is however, no effect of violent victimisation on labour income. Consistent with the increased likelihood of receiving benefit income, there is a 38% increase in non-labour income for each of the two years following victimisation. However, there is a 10-12% decrease in household income over the same duration. The fixed effects estimates indicate that after controlling for unobserved individual heterogeneity, there is no impact of victimisation on any of the economic outcomes under consideration.

We next examine the impact of property crime. The results are presented in the bottom panel of Table 4. Both models indicate that there is no impact of property crime victimisation on employment. In contrast, while the OLS model suggests no effect on the probability of receiving welfare benefitd, the fixed effects model indicates a 6-9% negative impact on benefit recipiency two to four years after the event. The results on the income measures are mixed. While the OLS estimates suggests a short-term positive and significant impact of property crime victimisation on labour income and no impact of non-labour income, the fixed-effects estimates uniformly indicate no impact on either of these outcomes. In contrast, both the OLS and fixed-effects estimates suggest a positive and sizeable impact of victimisation on total household income that lasts upto two years following the event.

The lack of impact on employment, on labour and non-labour income is perhaps not surprising, given the age group of the sample. Many of these individuals are likely

to be in school and unlikely to be full-fledged participants in the labour market. The positive effect of property crime on household income is possibly due to insurance claim settlements arising from the loss of property. This would also be consistent with the negative propensity to be on welfare benefits following property victimisation.

Table 4 presents the impact of victimisation on health and life satisfaction for 15-24 year old individuals. For this particular group, we also estimate the impact on the probability of finishing high school. The results of violent crime victimisation suggest that while there are negative impacts of experiencing a violent crime on the probability of finishing high school, on general and mental health, on satisfaction measures and positive impact on alcohol consumption, these effects reflect negative selection; once we control for unobserved heterogeneity in the fixed-effects models, we cannot reject the hypothesis that violent crime victimisation has no effect on the chosen outcomes.

The estimates in the bottom panel of Table 4 indicate that there are negative impacts of victimisation through property crime on general health and self-reported life satisfaction measures, even after controlling for unobserved heterogeneity. However, these effects are short-lived. In summary, we find that except for a short-term, positive impact of property crime on household income, crime victimiation has little effect on economic outcomes of 15-24 year-olds. While there is some evidence of a negative shock to health and life-satisfaction from property crime victimisation, individuals in this age-group seem to return to baseline health and satisfaction levels very quickly.

In Table 6, we present estimates of the impact of victimisation of some well-being measures. We expect to see some negative impact of victimisation, especially violent victimisation, on self-reported health and life satisfaction measures, given the evidence reported by other studies cited in the literature review. The estimates based

on the matching model indicate strong, significantly negative and persistent effects on general health, mental health, life satisfaction and satisfaction with family relationships. There is a temporary, though sizeable increase in alcoholic consumption. The fixed effects estimates are much smaller in magnitude and indicate that these effects are not long-lasting; most impacts are significant only for the year following the report of violent victimisation. With regard to property crime victimisation, the matching estimates again indicate negative and significant impacts on the two health and two satisfaction measures, though of much smaller magnitude relative to the impacts of violent victimisation. With the exception of a temporary setback in terms of life satisfaction, the fixed-effects estimates are all insignificant.

VII. Conclusions

This paper examines the causal effect of being victimised on labour market outcomes and general well-being using longitudinal data from the nationally representative Household Income and Labour Dynamics of Australia survey. Crucially for our analysis, individuals in HILDA are asked whether they experienced a number of major life events in the previous year including being a victim of violent or property crime. The richness of the data allows us to inform the literature in a number of ways.

First, we estimate OLS regression models on the entire population, propensity score matching models that examine outcomes for individuals who were crime victims compared to outcomes for non-victims with similar observable characteristics over the same time period, and fixed effects regression models that examine changes in outcomes for individuals before/after victimisation. We can estimate both matching models and fixed effects regressions because HILDA collects longitudinal data on a representative sample of both victims and non-victims, unlike the administrative data

typically used in this literature. Both the second and third types of models allow us to control for characteristics that may simultaneously cause certain individuals to be victims of crime and put them at higher risk of poor outcomes. Second, we estimate the impact on both labour market outcomes and general well-being. Clearly, becoming a victim of crime is likely to have impacts on individuals beyond the labour market. We believe that this is the first quantitative analysis to examine the impact of victimisation on more general measures of human capital and personal well-being.

Our results indicate that there is no causal impact of victimisation on employment or income; while estimates based on cross-sectional models indicate significant impacts, the fixed-effects estimates uniformly suggest that these results can be explained by unobserved heterogeneity. In contrast, there is strong evidence of a negative impact of victimisation on well-being measures, and these are especially strong for violent victimisation. However, these effects appear not to persist beyond the first year following victimisation.

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Table 1: Victimisation Rates Based on 2000 ICVS Survey: Percentage Victimised at least Once

Country	11 Crimes	Car Theft	Burglary	Robbery	Personal Thefts	Sexual Incidents	Assaults & Threats
Australia	**30.0**	**1.9**	**3.9**	**1.2**	**6.5**	**4.0**	**6.4**
Belgium	21.4	0.7	2.0	1.0	4.1	1.1	3.2
Canada	23.8	1.4	2.3	0.9	4.7	2.1	5.3
Catalonia (Spain)	19.0	0.4	1.3	0.9	3.0	0.8	1.5
Denmark	23.0	1.1	3.1	0.7	4.1	2.5	3.6
England and Wales	26.4	2.1	2.8	1.2	4.6	2.7	6.1
Finland	19.1	0.4	0.3	0.6	3.3	3.7	4.2
France	21.4	1.7	1.0	1.1	3.0	1.1	4.2
Japan	15.2	0.1	1.1	0.1	0.5	1.2	0.4
Netherlands	25.2	0.4	1.9	0.8	4.7	3.0	3.4
N.Ireland	15.0	1.2	1.7	0.1	2.2	0.6	3.0
Poland	22.7	1.0	2.0	1.8	5.3	0.5	2.8
Portugal	15.5	0.9	1.4	1.1	1.9	0.6	0.9
Scotland	23.2	0.7	1.5	0.7	4.6	1.1	6.1
Sweden	24.7	1.3	1.7	0.9	5.8	2.6	3.8
Switzerland	18.2	0.3	1.1	0.7	4.4	2.1	2.4
USA	21.1	0.5	1.8	0.6	4.9	1.5	3.4
All Countries	**21.3**	**1.0**	**1.8**	**0.8**	**3.9**	**1.7**	**3.5**

Source: Kesteren et. Al. (2000), pp.178-179

Note: All figures are based on incidence of crime in 1999

Table 2: Incarceration Rates - Prison Population per 100,000 of National Population

Country	1992	1995	1998	2001	2004
Australia	**89**	**96**	**107**	**116**	**120**
Belgium	71	75	81	85	88
Canada	123	131	126	117	108
Denmark	66	66	64	59	70
England and Wales	88	99	126	127	141
Finland	65	59	50	59	66
France	84	89	86	78	91
Japan	36	38	42	51	60
Netherlands	49	66	85	95	123
Sweden	63	65	60	68	81
USA	505	600	669	685	723
Germany	71	81	96	98	98
New Zealand	129	128	146	157	168

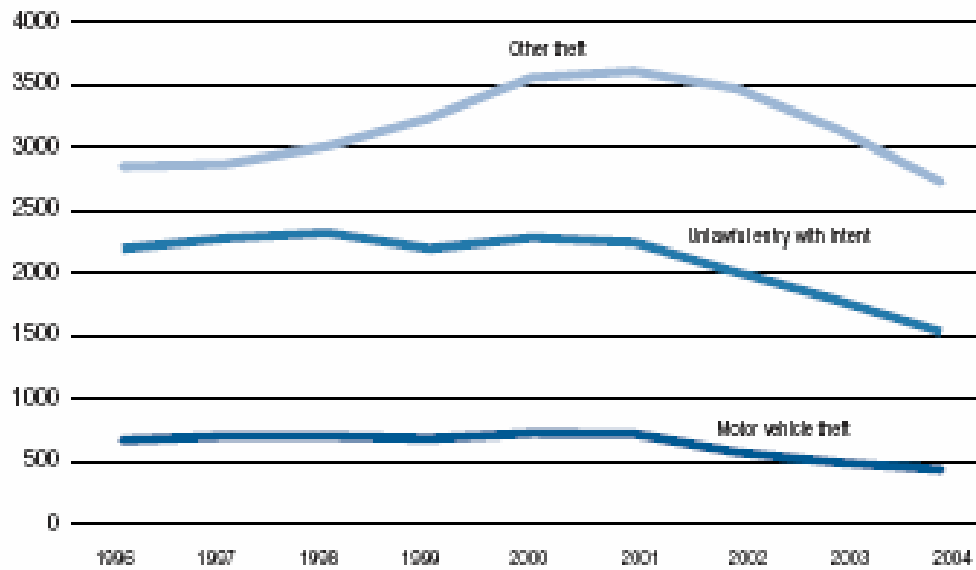*Source*: Prison Brief, International Centre for Prison Studies, UK - www.prisonstudies.org

Note: Prison population includes pre-trial detainees/remand prisoners

Figure 1: Violent Crimes, Rate per 100,000 persons, 1996-2004

Note: Homicide and kidnapping occur at rates of under 5 per 100,000 each, and as such are difficult to distinguish on this chart.

Figure 2: Property Crimes, Rate per 100,000 persons, 1996-2004

Source: Australian Institute of Criminology (2006), Australian Crime: Facts and Figures