FINAL REPORT TO THE CRIMINOLOGY RESEARCH COUNCIL

UNEMPLOYMENT AND CRIME: RESOLVING THE PARADOX *

John Braithwaite

Bruce Chapman

Cezary A. Kapuscinski

Australian National University

April 1992

* Our thanks to Carol Bacchi and Glen Withers for critical comments on an earlier draft of this paper.

ABSTRACT

While official crime statistics from many countries show that unemployed people have high crime rates and that communities with a lot of unemployment experience a lot of crime, this cross-sectional relationship is very often not found in time-series studies of unemployment and crime. In Australia there have been no individual-level or cross-sectional studies of unemployment and adult crime which have failed to find a positive relationship, and no time series studies which have supported a positive relationship. This is the paradox of unemployment and crime. Consistent with this pattern, a time-series of homicide from 1921 to 1987 in Australia reveals no significant unemployment effect. A theoretical resolution of the paradox is advanced in terms of the effect of female employment on crime in a patriarchal society. Crime is posited as a function of both total unemployment and female employment. When female employment is added to the model, it has a strong effect on homicide, and unemployment also assumes a strong positive effect.

There is a large body of literature relating criminal behaviour to the state of the labor market. In general, these studies show that there is a strong positive association between crime and unemployment at the individual level, a clear positive association at the cross-sectional level that gets weaker as the level of geographical aggregation increases, but quite an inconsistent relationship over time. The paradox of unemployment and crime is explored in Part I of the paper through a brief review of the empirical evidence. In Part II, a theoretical resolution to the paradox is advanced based on the contention that crime in general is a function of both total unemployment and female employment. Although we expect various types of crime to provide differential support of this theory, the contention is that crime in general will rise with both total unemployment and female employment. Our empirical evaluation of this hypothesis (presented in Part III) is restricted to one type of crime (homicide) in one country (Australia). Finally, Part IV addresses some policy implications of the revised understanding of the relationships between unemployment and crime developed in the previous two parts.

The paper therefore makes three quite separate contributions. Part I provides a synthesis of the literature which allows us to make sense of the confusion most criminologists feel about the state of the empirical evidence on unemployment and crime. There are good reasons to be cynical both about the claims of those who say that unemployment has been clearly shown to be associated with crime and those who say that unemployment has been discredited as an explanation. Part II is a contribution to the theory of unemployment and crime. It faults previous theoretical work for failing to think clearly about the separate effects of male and female unemployment and male and female employment in a patriarchal society. A theory that focuses on the significance of employment-unemployment in a patriarchal society not only opens up the prospect of an understanding of unemployment with more empirical bite; it also supplies a normative and historical framework for resisting the ill-conceived policy inference that keeping women in the home is a good way to fight crime. This issue is taken up in Part IV. In this context, Part III is not even the beginning of a systematic test of the theory in Part II. It is simply an

illustration of how the theory in Part II can guide a fruitful respecification of studies of unemployment and crime.

I THE PARADOX

Everyone believes that unemployment causes crime—everyone, that is, except a lot of leading criminologists (e.g. Fox, 1978; Gottfredson and Hirschi, 1990: 138-9, 163-5; Orsagh, 1980; Wilson and Herrnstein, 1985). For scholars from radically different theoretical positions, one of the few things on which they can agree is that unemployment should be found to be a cause of crime. Mainstream economists generally believe that unemployment is associated with crime because reduced expected utility from legitimate work decreases the opportunity costs of illegitimate work (Becker, 1968; Ehrlich, 1973). Marxist political economists since Engels (1969) have contended that the brutalization of the unemployed by capitalism is a cause of crime: "There is therefore no cause for surprise if the workers, treated as brutes, actually become such..." (Engels, 1969: 144-5). Scholars who argue a disparate variety of socio-cultural and psychological theories of both radical and conservative hues expect unemployment to be associated with crime because of the debilitating effects of powerlessness, alienation, absence of stake in conformity, lower-class pathology, culture of poverty, relative deprivation, wasted human capital, the negative effects of labelling, bad schools, blocked legitimate opportunities, illegitimate opportunity structures in areas with high unemployment, to name just a few of the mechanisms posited (Box, 1987: 28-67; Braithwaite, 1979: 64-101). Needless to say, they are explanatory frameworks of variable plausibility (Braithwaite, 1979: 64-101), even though they converge on a common prediction.

Consistent with the predictions of these diverse theories, individual-level data on adult crime from many countries consistently show a strong relationship between unemployment and crime. People who are unemployed are much more likely to be arrested for or convicted of crime than employed people (see many studies cited in Belknap, 1989: 1456; Braithwaite, 1979: 23-63; Clinard and Abbott, 1973; note also Duster, 1987;

Farrington *et al.*, 1986), at least for the males who dominate these studies (but note the sex disaggregation in Cameron, 1964). Even with self-report delinquency studies where the class-crime relationship is most hotly contested (Tittle, Villemez and Smith, 1978), there is some suggestion of an unemployment effect that is strong where more global measures of class have weak effects (Brownfield, 1986). Within cities, neighborhoods with high unemployment rates have high crime rates (Allison, 1972; Bechdolt, 1975; Bloom, 1966; Fleisher, 1966; Shaw and McKay, 1969; Sjoquist, 1973; Vinson and Homel, 1972; Braithwaite, 1979: 29-32; Chiricos, 1987: 195; Sampson and Wooldredge, 1988). Between cities, those with high unemployment generally have more crime than cities with low unemployment (Carroll and Jackson, 1983; Danziger, 1976; DeFronso, 1983; Fleisher, 1966; Jiobu, 1974; Singell, 1968; Williams and Drake, 1980; for studies that do not find this see Danziger and Wheeler, 1975; Schuessler and Slatin, 1964; Spector, 1975; Land *et al.*, 1990). Between American states, those with high unemployment tend to have more crime (Hemley and McPheters, 1974; Sommers, 1982; Chiricos, 1987; but for mixed or contrary results see Ehrlich, 1973; Holtman and Yap, 1978; Wadycki and Balkin, 1979; Land *et al.*, 1990). Nations with higher unemployment rates have higher homicide rates (Krohn, 1976), though when less reliable international comparative data on property crime are examined, the unemployment-crime association disappears or even becomes negative (Krohn, 1976), a situation mirrored in international comparative studies of income inequality and crime (Braithwaite, 1979: 203-8; Braithwaite and Braithwaite, 1980; Hansmann and Quigley, 1982; LaFree and Kick, 1986; McDonald, 1976; Messner, 1986).

At the time-series level of analysis, however, it is far from universally found that periods with high unemployment are periods with high crime rates. Gurr, Grabosky and Hula's (1977) landmark time-series analysis of crime rates in London, Stockholm and Sydney found economic recession to be associated with jumps in the crime rate in the nineteenth century but not the twentieth century. In Chiricos's (1987) review of other time series studies of the unemployment-crime nexus, he found 43 positive relationships, 22 of them statistically significant, and 26 negative relationships, 5 of them statistically

significant. This has been interpreted as a revisionist review showing that the balance of time-series studies, like the balance of cross-sectional studies, clearly supports an unemployment-crime association. However, the success of time-series studies in supporting the unemployment-crime association is somewhat less than these data indicate because no studies published before 1975 are included in this review of time-series studies. Chiricos's time-series conclusions are biased in terms of his own finding that studies including post-1970s data are much more likely to find significant unemployment effects. Only three of Chiricos's time-series studies have pre-1935 data that are vulnerable to the unexpected fall in crime of the Great Depression. Earlier reviews that are dominated by pre-1975 studies and studies that include data from the Depression reach more negative conclusions (Gillespie, 1978; Long and Witte, 1981; Vold, 1958: 164-81; Sellin, 1937). Archer and Gartner's (1986) study of unemployment and homicide for 16 nations between 1900 and 1972 found nine nations (including the U.S.) to have a positive association and seven nations (including Australia) to have a negative association.

In this paper we advance a theoretical resolution to the time-series puzzle and use this theory to rethink Australian data on homicide during the twentieth century. This is thus hypothesis testing on one type of crime in one country. But the Australian context is one in which the paradox is in particularly sharp focus. As we noted, the unemployed are strongly over-represented among Australian offenders (Braithwaite, 1978, 1980; Kraus, 1978; South Australian Office of Crime Statistics 1979, 1980(a); Wearing, 1990) and there are no Australian cross-sectional studies on individual or aggregate adult offending that have refuted an unemployment effect. Yet five time-series studies have all failed to support an unemployment effect. In Withers' (1984) study, a pooled cross-section for 104 data points between 1964 and 1976 unemployment has a non-significant *negative* coefficient for homicide and three other offense categories. Archer and Gartner (1986) found a quite strong *negative* correlation between unemployment and crime for the years 1903 to 1972. Mukherjee (1981) reported a weak negative association between unemployment and crime across the century. However, when he divides the century into "environmental sets"—

argued to be historically homogeneous periods—within all but one of the seven time periods there was a positive association between unemployment and crime. Naffine and Gale (1989) in a simple bivariate analysis found little basis for an association between youth unemployment and youth crime across time in South Australia, particularly for females. Finally, in Grabosky's (1977: 166-7) time-series regressions for Sydney in the 19th and 20th century (up to 1969) economic conditions had no significant effects on either violent or property offenses.

A fair way of summarizing the evidence on unemployment and crime is that of a very strong, consistent, relationship at the level of individuals and intra-city analyses of areas with high versus low unemployment , less consistent but still very strong support for the association at the inter-city level of analysis, mixed but fairly supportive results at the inter-state[1] and international levels of analysis, and mixed but fairly unsupportive results at the time-series level of analysis. Moreover, as we move away from the individual and census tract data that have engendered confidence to the more discouraging time-series results we move away from relationships that can be very strong indeed. For example, Gil (1970) found that 48 per cent of child-abusing fathers had been unemployed during the year preceding the abuse (a finding subsequently confirmed in a reanalysis with a matched sample of non-abusing families (Light, 1974; see also Devery, 1992: 16)). The South Australian Office of Crime Statistics found 75 per cent of individuals received into custody under sentence were unemployed in 1979 (South Australian Office of Crime Statistics, 1979).

---

[1] Chiricos (1987: 195) interprets the less encouraging results as we move from census tract to city to state in the following terms:

"Why should the U-C relationship for property crimes be most consistently significant at the intra-city level and least consistently significant at the national level? One possibility is that there is less aggregation bias at the lower levels of aggregation. That is, the lower and smaller units of analysis are more likely to be homogeneous, thereby reducing variation *within* each unit, and allowing for more meaningful variation *between* units, which is what U-C research is trying to measure. Thus, national-level data may literally cancel out the substantial differences in unemployment and crime that characterize different sections of cities or cities themselves. Given these important areal variations at lower levels of analysis, national data can only serve to "wash-out" otherwise rich sources of between-unit variation essential to assessing the U-C relationship."

This is the puzzle of unemployment and crime: why is a relationship that is so strong at the individual and census tract level so equivocal in time-series?

II THEORY

One way to resolve the puzzle of unemployment and crime is to argue that the reason for the strong cross-sectional association is not based in any direct causal association between unemployment and crime. Instead, common personal pathologies such as poor impulse control (Wilson and Herrnstein, 1985; Gottfredson and Hirschi, 1990) explain both unemployment and crime. Certain types of people cannot hold down a job because they cannot control their impulses; they also commit crime because they cannot control their impulses. Unemployment and crime are only correlated cross-sectionally because they are effects of a common cause. If this view is right, changes in unemployment across time will not affect the crime rate since it is only the changes in causally antecedent levels of impulse control that have such an effect. Our first objective is to develop an alternative structural explanation to this psychological explanation of the unemployment-crime association as spurious.

The most sustained reformulation of the theory of unemployment and crime in the contemporary literature is in the work of Land and his co-authors (Cantor and Land, 1985; Cohen and Land, 1987; Land, Cantor and Russell, 1992). This work construes of unemployment as having positive effects on crime through increasing criminal motivations at the same time as it has negative effects by reducing criminal opportunities (victim-target availability). While the empirical work arising from this theoretical respecification has its critics (Hale and Sabbagh, 1991), it is an approach that attempts systematically to resolve the inconsistencies in the unemployment-crime findings, at least within the United States. We choose not to make a contribution to this debate; given limitations with the relevant Australian data, it would be hard for us to move this issue forward in any case. Instead, we choose to open up a new front in the battle to resolve the contradictions of unemployment and crime. In doing so, we reconceptualize some of the ideas of the Land–

Cantor–Cohen–Felson–Russell group on the crime-reducing effects of unemployment in terms of guardianship and target availability. We reconceptualize them as positive effects of employment instead of negative effects of unemployment, a move we contend is theoretically strategic.

TOWARD A THEORETICAL SOLUTION TO THE PUZZLE

Our suggestion for resolving the puzzle of unemployment and crime is to consider disaggregation of the labor market by sex. It is not our hypothesis that the theory predicting that unemployment causes male crime does not apply to female crime. When women are rejected by the legitimate labor market, the illegitimate labor market becomes more attractive for them just as it does for males. Women, as men, in poverty have less to lose from a criminal conviction, and unemployed women have more to gain from property crime than women who are accumulating property legally in a job. It is likely that the experience of unemployment is as humiliating an experience for women as it is for men since for both sexes it is likely to engender a sense of resentment at the injustice of their situation. This can spill over into anger, excessive consumption of drugs such as alcohol, and rage. A factor that might make the effect of female unemployment on the crime rate stronger than male unemployment's effect concerns victimization rather than offending. Women who cannot get a job to escape from economic dependency on a violent male breadwinner sometimes continue to expose themselves and their children to violence as a result.

However, the structural context of female employment in a patriarchal society suggests a number of contrary effects. It is plausible that the ways in which female employment increases crime in a patriarchal society relate to women's supervisory role, their special vulnerabilities to crime in both public space and in the home, and the new opportunities for crime that labor force participation brings for both men and women. These contrary effects will have differential force and applicability for different types of crime, as we shall explain below. However, the general theory is as follows: unemployment (searching unsuccessfully for a job) causes crime for both men and women

by changing the reward-cost ratio for crime and by fuelling emotions of resentment and hopelessness. As well, rising female employment causes crime to increase in the context of a patriarchal society. The failure of a number of previous studies to find a strong time-series effect of unemployment on crime is a result of the failure to disaggregate these gender effects. If time-series analyses show no unemployment-crime relationship when female employment is omitted, it may be the case that there is a significant correlation between female employment and unemployment (such that omitting the variable systematically reduces the unemployment effect on crime). This omission will be more important in time-series than in cross-sectional studies because female labor force participation has varied so enormously across time. However, in cross-sectional studies where geographical variation in female employment is substantial, our theory is that this will suppress the effect of unemployment on crime in these studies as well.

BEYOND THE ADLER THESIS

Debate on the question of women, crime and the economy has been unproductively locked into the Adler thesis about the rise of the new female criminal (Adler, 1975). According to Adler, the women's liberation movement has caused an increase in female crime because females have become more masculine. This is an unsophisticated argument (Alder, 1985; Scutt, 1980; Smart, 1979) since there is no necessary reason why qualities of maleness that cause men to commit more crime will be transferred to women who become liberated.

Moreover, the empirical evidence is not overwhelming that there has been a rise of a new female criminal. Where female crime rates have risen in the U.S., Britain and Australia, it has been mostly in property offenses of a sort traditionally engaged in by females (Box and Hale, 1983; Challinger, 1982; Steffensmeier, 1981; Steffensmeier and Steffensmeier, 1980). In addition, where female crime rates have risen, male crime rates have often risen as much or more (Boritch and Hagan, 1990; Naffine and Gale, 1989; Mukherjee and Fitzgerald, 1981)

Empirically, therefore, there is little warrant for the conclusion that an effect of the growth of the women's movement has been an increase in female crime. Feminist commentators on this literature usually take this a step further, arguing that "the movement of women into the paid labor force is not associated positively with the rise in observed female crime" (Naffine and Gale, 1989:145). On this latter question, we advance a different perspective. Rising female employment, we hypothesise, may increase crime not only by expanding criminal opportunities for employed women. Three other reasons are hypothesized. First, rising female employment may increase criminal opportunities for males. Second, it may also increase women's vulnerabilities as *victims* of crime. Third, it may increase the vulnerabilities of other members of their families to being victims and offenders to the extent that slack in traditional female guardianship responsibilities is not taken up by men, child care services and other institutions. Thus there is much more to the story than the movement of women into the labor force pushing up *female* crime.

The theoretical position we advance in this paper seeks to separate the women's movement effect from the employment effect. We show that it is theoretically coherent to believe that a stronger women's movement will reduce crime while believing that rising female employment has upward effects on the crime rate. Elsewhere, one of the authors has advanced a more theoretically complete account of why patriarchal institutions foster crime and therefore why social movements against patriarchy are central to progress in controlling crime (Braithwaite, 1991a, 1991b). In the current analysis our theoretical mission is limited to showing how it is possible to reconcile such a view with the conclusion that rising female employment causes crime. The first step to resolving the confusions about women's liberation and the presence or absence of a rising female crime rate is to understand that "the labor force participation of females in advanced industrial societies is distinguished by two distinct trends: a substantial rise in both female employment and female unemployment" (Naffine and Gale, 1989: 145). This, at least, is true during certain periods of recent Australian history. The profile of women affected is different: working class women are the primary victims of rising female unemployment,

while middle class women the primary beneficiaries of rising female employment. As job opportunities have expanded for educated women with work experience who wish to re-enter or stay in the paid economy, opportunities have contracted for young, unskilled and/or uneducated women (Windschuttle, 1979: 141). Rising unemployment among young uneducated women, the feminization of poverty and widening economic horizons for educated women have historically gone hand in hand.

Having given reasons why rising female unemployment should cause crime to increase, it is useful now to give a more complete account of why rising female employment should also cause crime to increase in the context of the persistently patriarchal society that 20th century Australia has been (Broom, 1984). Three aspects of the hypothesized positive effect of female employment on crime within a patriarchal society will be posited—a supervision effect, an opportunity effect and a vulnerability effect.

THE SUPERVISION EFFECT

In a society where the lot of women is to stay at home instead of working in the market place, women are the watchdogs of suburbia. Their presence decreases the likelihood of the house being burgled or vandalized, the bicycle from being stolen from the yard, the car being stolen from the driveway or kerb. The evidence from scholars working in the "routine activities" theoretical tradition is quite impressive in this respect (Cohen and Felson, 1979; Cohen et al., 1981; but see Miethe et al., 1987). Suburbs that are left substantially unguarded during the day by two-income families have higher burglary rates than suburbs where more of the women retain their traditional supervisory role in the home.

Women in patriarchal societies are not only the watchdogs of property; they are also the supervisors of children (Baxter and Gibson, 1990). This is an important role because the evidence from criminology is strong that children commit a large proportion of crimes (Gottfredson and Hirschi, 1990: 123-44; Greenberg, 1985; Walker, 1991) and that poorly supervised children engage in much more delinquency than well supervised children (Gottfredson and Hirschi, 1990; Wilson and Herrnstein, 1985: 226-44).

"Latchkey children", alleged to roam unsupervised after school, have been a growing consequence of the increasing two-parent labor force participation in Australia (Wilson et al., 1975). Erosion of supervision for these children has left them not only more vulnerable to being led astray by delinquent peers, but also more vulnerable to being victims of crime, including the most horrific of crimes (Fiala and LaFree, 1988).

This, we emphasise, is an effect that is not necessary or inevitable, but rather contingent upon female employment rising in a patriarchal structural context. In an egalitarian society, when one partner who has been out of the labor force returns to it, the other working partner will compensate by increasing their burden of supervisory responsibilities. Men in the neighborhood might take it in turn to use "flex-time" (a common employment condition in Australia) to spend afternoons supervising children. An egalitarian society might universally assure the availability of after-school programs to care for children rather than assume the availability of mothers for after-school supervision. But the structural context of the data we analyse in Part III is not that of an egalitarian society; it is of a patriarchal society where such programs are today not universally available, and until the 1970s were hardly available at all (see Brennan (1987) and Teal (1990) for data on the availability of child care in Australia).

Our hypothesis is not, therefore, that rising female labor force participation necessarily has a negative effect by eroding the supervision of children. Absent patriarchy, rising female labor force participation would not cause crime for this reason any more than would rising male labor force participation. This is because without patriarchy responsibility for caring for children would not be rigidly gendered but shared in a way that guaranteed flexible arrangements to supervise children; property would be guarded with real watchdogs, security firms, alarms and neighbourhood watch programs. In fact, the empirical evidence on the supervision of children seems clear. There is nothing inherently criminogenic about mothers working, so long as loving alternative supervision of children can be provided from other quarters such as relatives and child care centers (see the studies reviewed by Wilson and Herrnstein, 1985; 245-63). The rub in Australia has

been that while male caring for children and the availability of affordable child care center places have improved somewhat, the supply has remained below the demand created by the movement of women into the workforce (Brennan, 1987).

THE OPPORTUNITY EFFECT

In a society in which homemaking and child-care are gendered, women tend to drop out of the labor force entirely for long periods of their lives. During these periods, opportunities for women to engage in many of the most remunerative kinds of crime are sharply reduced. Examples of such crimes are fraud, non-fraud computer crimes, bribery, environmental, antitrust, consumer protection, occupational health and safety crimes perpetrated on behalf of the employing organization, and embezzlement and petty pilfering against the employing organization. Those who do not participate in the labor force do not have the opportunity to engage in personal income tax fraud nor in corporate tax fraud on behalf of an employer. Ironically, non-participation in the labor force also means less opportunity to engage in unemployment benefit fraud than that open to a participant in the labor force who moves in and out of employment. Clearly, however, the opportunity effect of female labor force participation is not credible concerning crimes of violence, even though labor force participation is likely to increase the amount of conflictual contact with other persons (such as bosses, workmates and government officials who administer unemployment benefits or regulate workplaces).

Labor force participation by a second member of the household increases not only the opportunities for the second member of the household to engage in crime; it also increases opportunities for others to prey on the household. This is partly a matter of a two-income family generating an increased stock of assets for the criminal to target. When two cars are being driven to work each day, the probability of car theft may double; when the family uses its second income to buy a second house at the beach, their vulnerability to burglary may more than double; when two purses with two pays are carried home each day, expected losses from purse-snatchings increase. The opportunity effect is really a special case of a more general increased vulnerability effect to which we now turn.

THE VULNERABILITY EFFECT

There are some extra vulnerabilities that women are exposed to in places of work. It is reasonable to suggest that female participation in the workforce of a patriarchal society increases the vulnerability to crime women face in both public and private space. Women are more vulnerable to violence in the home than in public space because the person most likely to assault or rape them is a male intimate who is consensually and routinely admitted to their private space—a husband, father or boyfriend (Hopkins and McGregor, 1991; Scutt, 1983). It does not follow, however, that a woman who spends less of her time in the home and more time in public space by venturing out to work will be safer. This is because workaday female ventures into public space occur generally during the periods when the males who are their domestic assailants are also at work. The home is generally a safe haven for women during the day since daytime criminals who target homes almost never assault occupants, choosing generally to move on to an unoccupied home.

Leaving the home to go to work should increase the vulnerabilities of women during these times. Women who walk to bus stops, from car-parks, or who return from railway stations in the evening are likely to be more vulnerable to personal victimization during these periods than they would be at home. At work itself during these hours they are somewhat more vulnerable to violence and sexual assault than if they were alone at home, and in some industries they are exposed to very high vulnerabilities to occupational health and safety crimes. Suburban women who do not have to travel to work in the city can more easily avoid crime "hot spots" that Sherman et al. (1989) found to be the site of most predatory crimes in Minneapolis. They described the top dozen "hot spots" as a number of intersections (particularly near bars, liquor stores and adult book stores), malls, bus depots and bars. Women who work downtown in the female-dominated service sectors sometimes not only cannot avoid walking through such hot spots, frequently they work in them.

A variety of data are consistent with these conclusions. Most sexual harassment complaints and litigation arise from exploitation in workplaces (Grabosky and Braithwaite,

1986: 144-6; see also Stanko, 1990: 97) a fact feminists have interpreted as a structural consequence of the economic subordination of women to men in patriarchal workplaces (Messerschmidt, 1986: 146-7). A 1983 Australian crime victims survey found that women who work are more likely to report sexual assault than women who are not in the workforce (Australian Bureau of Statistics, 1986: 18). One might expect that women alone at home would get more nuisance telephone calls, which are mostly sexual harassment calls. In fact, however, employed women, especially those in part-time employment, get massively more than those who are not in the workforce (Braithwaite and Biles, 1979: 198). Victimization by "peeping Toms" and indecent exposure, in contrast, does not significantly vary according to whether women are in the workforce, but unemployed women are ten times as likely to suffer victimization by peeping Toms (Braithwaite and Biles, 1979: 198).

A 1988 Australian victims survey of 1100 women failed to disaggregate women into those who were unemployed and those not in the workforce. Even so, women who were "not working" suffered only one quarter the victimization rate of working women. This effect consistently held up for sexual incidents (assault or harassment), threats of violence, actual violence, theft from the person and robbery.[2]

There is a misinterpretation of data in criminology that denies this vulnerability of women. Crime victim surveys show that women and old people are objectively less likely than men and young people to be victims of crime, but are subjectively more afraid of crime (Hindelang *et al.*, 1978; Braithwaite *et al.*, 1982). This is construed by some as an irrational fear of crime among women and old people, given the objective facts of their vulnerability. This story, according to our theory, should be put in reverse. Women and old people are more vulnerable to crime when they interact with other human beings both because they are physically weaker than young men, but also because women and old people are stereotyped as weak by potential offenders. The rational fear that women and

---

[2] Unpublished data supplied by John Walker of the Australian Institute of Criminology. Details of the survey can be found in Van Dijk et al. (1990).

old people have about venturing out into dangerous public spaces alone causes them to do so less than young males. The decisions of women not to venture alone in dangerous places reduces the objective victimization they suffer compared to males. In addition, housewives and the retired elderly live a lifestyle that leaves them safe alone in their home during the working day. When housewives enter the workforce, they forego their solitary daytime fortress for the comparative vulnerability of the streets and the workplace.

When they return from work in the evening, they are no less vulnerable to domestic violence. Indeed, in a patriarchal society, they may be more vulnerable. In such a society, many men expect a great deal from working women, such as a dinner prepared by their wife to be waiting for them on the table even though she gets home from work no earlier than he does. Failure of a dinner to be waiting on the table is a surprisingly common trigger of domestic violence in Australia (Hopkins and McGregor, 1991: 119). Husbands may expect a tidy and ordered house and respond violently when these kinds of expectations are not fulfilled. Again, this is an effect that is contingent upon patriarchal values among men who have expectations that cannot easily be met when their partners work. Absent patriarchy, this effect would not apply, as domestic labor would be shared justly by partners who were both in the labor force. Absent patriarchy, men would not react with violence to employed women who do not meet unrealistic expectations for domestic work.

It is worth pointing out here that it is also true in Australia that unemployed female youth spend a lot of time hanging around shopping centers (Alder, 1986; Presdee, 1982) and that one reason the unemployed suffer higher rates of criminal victimization in Australia, as in the U.S., is that they spend a lot of their time in vulnerable public spaces (Braithwaite and Biles, 1979). But this is the whole point of our story. The effects of unemployment are a quite different matter from the effects of employment. While the unemployed have much higher rates of criminal victimization than the employed, those not in the workforce (those who stay at home) have much lower rates of criminal victimization than both the employed and the unemployed (Braithwaite and Biles, 1979: 198).

Finally, the mere act of a wife being a breadwinner can be a provocation to a patriarch, especially one who feels insecure about his own capacity as a breadwinner. Much crime, particularly violent crime, is motivated by the humiliation of the offender and the offender's perceived right to humiliate the victim. Patriarchal societies and other kinds of unequal societies (e.g. societies with a brutalized underclass, with slavery or apartheid) are structurally more humiliating than egalitarian societies (Braithwaite, 1991a). Katz's (1988:23) empirical work shows how violence can be "livid with the awareness of humiliation". In a patriarchal society, what is humiliating is gendered. It becomes possible, even common, for patriarchs to feel devastated by even modest success in the workforce by a wife. Similar perversity arises in other contexts of violence. Prison guards can react with extreme violence toward prisoners when prisoners receive treatment "as if they are equals" (Stotland, 1976; Stotland and Martinez, 1976:12; Scheff et al. 1989: 193; Braithwaite, 1991a).

Rage transcends the offender's humiliation by taking him to dominance over the situation. Other studies of homicide by men against women confirm that homicide can be viewed as an attempt by the male to assert "...their power and control over their wives" (Wallace, 1986: 126; Polk and Ranson, 1991). Just as humiliation of the offender is implicated in the onset of his rage, so the need to humiliate the victim enables her victimization. Patriarchy as an ideology entails women being deserving of humiliation and men feeling humiliation by the suggestion that their wife could be equal or superior to them on as critical a dimension of male dominance as breadwinning. This is part of the ideological context in which women spending a higher proportion of their time in public space can increase their vulnerability to crimes committed in private space.

There is indeed a compelling micro-sociological literature supporting the conclusion that "the conflict between the emerging equalitarian social structure and the continuing male superiority norms will tend to increase rather than decrease conflict and violence between husbands and wives" (Whitehurst, 1974: 76). The work of Allen and Strauss (1980), Brown (1980), Gianopulos and Mitchell (1957), Glazer-Malbin (1985: Table 7) Nye

(1958, 1963), and Kolb and Strauss (1974) indicates that transition to workforce equality can be a cause of violence within families. Allen and Strauss (1980: 203) report from a study of 400 couples that "the more the wife's resources exceed those of her husband, the more likely the husband is to have used physical force during the referent year."

Beyond this micro-sociological data, there is cross-sectional data indicating a positive effect of female employment on crime. Wiers' (1944: 32-3) classic study of delinquency in Michigan found that counties with high percentages of females employed in 1929 had high delinquency rates. A study of 58 New York counties by Garbarino (1976) found the percentage of women in the labor force to be the strongest of 12 predictors of child abuse. A cross-national study by Fiala and LaFree (1988) found nations with high levels of female labor force participation had higher child homicide rates (a result replicated by Gartner, 1990). Gartner (1990) also found that female employment was positively associated cross-nationally with the rate of homicide deaths for adult females but not adult males. In another Canadian study, Gartner and McCarthy (1991) found that while employed women were over-represented among homicide victims prior to 1970, this was not true after 1970. Even on the post-1970 data, however, Gartner and McCarthy (1991: 305) found that married women were at "greater risk of femicide if their employment status exceeds their husbands' but at lower risk if their husbands' employment status exceeds theirs." Women who were employed and married to an unemployed husband suffered six times the number of homicide victimizations that one would expect, given the proportion of the population in this group. Having established that our theoretical framework is consistent with a deal of evidence, we will now see if it has the predictive power to resolve the paradox of unemployment and crime.

III RESOLVING THE PARADOX OF AUSTRALIAN UNEMPLOYMENT AND HOMICIDE

PREDICTIONS

Our theory leads us to formulate the following model explaining crime in any patriarchal society:

Crime = α.male unemployment + β.female unemployment + γ.female employment + δ [a vector a socio-demographic variables]

with the predictions that α, β and $\gamma > 0$.

In practice, however, since male and female unemployment are highly correlated across time (in our data r =.84), multicollinearity concerns counsel consideration of three separate models—one with total unemployment, one with male unemployment and the third with female unemployment.[3]

Thus, our research strategy begins with a test of the effect of unemployment on crime without controlling for female employment. Step two consists of evaluating the strength of the unemployment effect when female employment is added to the model.

THE DEPENDENT VARIABLE

For Australia, homicide is by far the best offense category for testing time-series effects since it is the only one available nationally over a long period with a uniform definition. For other offense types, time-series of offenses known exist only for the post-World War II period and there are worrying definitional differences among the six states.

---

[3] The addition of female employment to any of these models, however, is not going to cause major multicollinearity problems, as its correlation with female unemployment is .15 and with male unemployment is .28. One should be wary, however, in judging multivariate relationships on the basis of simple bivariate correlations. In fact, the joint long-term behavior of the unemployment, employment and homicide variables is of importance which, as explained in Appendix C, confirms the need to account for female employment when linking homicide with unemployment. Although it was not our intention to build a dynamic Error Correction Model linking homicides with the labour market variables, it is useful in this context to report simple tests for cointegration between the variables of interest. Thus, testing for cointegration begween homicide, male unemployment and female employment revealed no evidence against the null of long-run relationship (i.e. cointegration) between these variables. On the other hand, a test applied to homicide and male unemployment only rejected the null of cointegration.

Credible testing of our model on offenses other than homicide will have to be done in nations with better time series than Australia for these offenses.

It is important to note that in attempting to get an unemployment and crime model to work with homicide, we chose the least likely offense type where this can be accomplished. Chiricos (1987: 193) found that only 16 per cent of unemployment-murder studies have found a significant positive effect, with 5 per cent showing a significant negative effect. This is the least impressive track record for any offense type for supporting the unemployment-crime relationship on aggregate data (see also Box, 1987: 87; Land *et al.*, 1990).[4] It follows that we can claim to be effecting a relatively robust test of our theory because we have selected a least likely case (Eckstein, 1975)—homicide data that includes the Great Depression.

Homicide rivals motor vehicle theft statistics in terms of validity, while exceeding it in seriousness and avoiding the tricky matter of how to deal with the effect of rising motor vehicle ownership across the century on motor vehicle theft rates. The data we rely on are collected for public health purposes; the error in homicide series caused by unlawful killing through the use of a motor vehicle becoming homicide at different points of time in different jurisdictions is eliminated by excluding all such deaths from the series.

Figure 1 shows a plot of homicide and total unemployment in Australia since 1921. Immediately, one reason for a limited effect of unemployment on homicide is clear. The homicide rate actually fell during the period following the most dramatic unemployment change—the Great Depression. Similar American findings that crime actually fell during the Great Depression (Henry and Short, 1954: 174) are one reason for the finding of Chiricos's (1987) review of 63 studies of the unemployment-crime relationship that it is mostly earlier studies which fail to find a significant association between unemployment and crime.

---

[4] Burglary has the most impressive record (Chiricos, 1987: 193; Cook and Zarkin, 1985).

Some scholars believe that crime did not rise during the Great Depression because the rich were actually hit harder than the poor in dollar terms during the depression, so the income distribution actually became more equal (Mendershausen, 1946).[5] If you take the view that it is income inequality rather than unemployment that is the theoretically correct predictor of crime (Box, 1987: 86-90; Braithwaite, 1979), then we can make sense of the counter-intuitive results for the Great Depression.[6] However, this article is focused simply on resolving the paradox of unemployment and crime, leaving in abeyance whether unemployment is the most theoretically coherent index of the sort of inequality that best predicts crime. Whatever position one has on which is the best index of poverty or inequality, the unemployment-crime paradox must remain a troubling one. To resolve it credibly, we must come up with a new model that can explain a positive effect of unemployment and crime in spite of the negative bivariate association for the depression.

INSERT FIGURE 1 ABOUT HERE

Australian homicide rates are fairly average compared to other industrialized countries (Mukherjee and Dagger,1991:26), hovering between a quarter and a fifth of U.S. homicide rates. Sources for the homicide and all other data are given in Appendix A.

THE LABOR MARKET VARIABLES

The two main regressors of interest are unemployment and female employment, both used as rates, that is, as proportions of the respective labor forces. Unemployment and employment are not in general the opposite sides of the same coin because the level of unemployment is influenced importantly by the size of the labor force. That is, without any change in the number of available jobs the unemployment rate can increase simply by there being a larger number of persons searching for employment.

---

[5] Consistent with this interpretation, Henry and Short (1954: 40) found that suicide by the economically privileged was more sensitive to fluctuations in the business cycle during the 1930s than suicides by the poor.

[6] Moreover, it is true that the relationship between income inequality and crime is more strongly supported in aggregate data than the relationship between the number who are poor or unemployed and crime (Belknap, 1989; Braithwaite, 1979; Box, 1987: 86-90).

The relationship between job search behaviour and employment creation helps explain why there is a small positive correlation in our data between female employment and female unemployment. As the number of women in jobs increases so too does the number of women actively looking for employment. In the Australian labor market (and in other similar economies) this is a commonly found phenomenon (Chapman, 1990). It is worth mentioning that despite the many sources used (see Appendix A) the labor market variables are consistently defined. In fact the study by Keating (1973), on which our earlier data are based, was able not only to link the historical labour market data to the present official statistics but also provided extensive cross-checks with population census benchmarks throughout the century. Nevertheless, some caution is required given that, for example, the female employment variable may be subject to under-enumeration of female farm labour. Also the early unemployment series were derived from trade union sources which may have understated the actual pool of the unemployed. If implemented, such corrections would lead to general upward revisions of the series. These would be arguably numerically small revisions that would be unlikely to translate into changes in our results.

OTHER CONTROLS

Previous theory and research indicates that certain other variables have effects on crime that should be controlled in the model. The aspiration was to operationalize as controls all of the variables that Braithwaite (1989: 44-49) argues are consistent correlates of crime that ought to be accommodated by any credible theory. While sex is one of these variables, the proportion of females in the population does not vary substantially across the twentieth century, so a control is not needed here.

However, sex-specific age composition does vary. Percentage of the population in the highest crime group—18 to 24 year old males—was entered as the control. Similarly, urbanization is a strong correlate of crime in official crime data, victim surveys and self-report surveys (FBI, 1985: 145-6; McGarrell and Flanagan, 1985: 286, 373). Thus, percentage of the population living in metropolitan areas was entered into the model.

Since marriage is negatively associated with crime (Martin et al., 1979; Parisi et al., 1979: 628; South Australian Office of Crime Statistics, 1980(b); Wolfe et al., 1984), percentage married is entered, as is percentage divorced, which previous work on aggregate data has shown to be positively correlated with crime rates (Gartner, 1990; Shaw and McKay, 1969; Vinson and Homel, 1972).

When combined with the economic variables discussed above, these independent variables cover the consistent correlates of crime discussed by Braithwaite (1989: 44-49) except for residential mobility, differential association with delinquent friends, attitudes and attachments to school, educational and occupational aspirations and belief in the law. Data are not available for these latter variables across the century.

Two additional controls were motor vehicle ownership, which Mukherjee (1981: 113) found to be an important predictor of crime in Australia across the twentieth century, and the growth rate of real GDP which Braithwaite and Braithwaite (1980) found to be important with cross-national homicide data. Criminal justice variables such as the imprisonment rate are not included because of gaps in the data and because of our theoretical position that the homicide rate is a likely cause of the imprisonment rate (see Hale, 1989).

Time has been included in the model, which makes it more likely that the estimation controls in part for other unmeasured trends in homicide rates and their determinants. However, the form of the equation does not allow for a diminution in the female employment-crime nexus due to possible changes in the extent of patriarchy. This is an interesting possibility we leave to further research.

RESULTS

The estimated versions of our models are presented in Table 1. As in so many previous studies, the total unemployment rate has a positive effect on the crime rate, but one that does not reach statistical significance in any specification that excludes female employment. The control variables also have weak effects on homicide with the exception

of the percentage of the population married, which has a very strong negative effect on homicide.[7]

TABLE 1 ABOUT HERE.

Overall the models do not present serious diagnostic deficiencies (see Table 2), although there are important statistical differences depending on whether or not female employment is included in the equations. Interestingly, the traditional models—those excluding female employment—are relatively weak in statistical terms. Unlike the equations reflecting our perspective, the conventional models exhibit evidence of second-order serial correlation, heteroskedasticity and a lack of credible functional form (as reflected in the results of the RESET tests). The presence of second-order serial correlation identified in the modelling omitting female employment implies that a variable not included is systematically related to the homicide rate two years before. The presence of heteroskedasticity means that the equations as specified do not have constant error variance, resulting in biased t-statistics. Further, the rejection by the RESET test suggests that there is something left out of the linear form of the equations which is distorting the results. The important point is that these statistical difficulties are not evident in the models that include female employment.

Though the models were estimated with data up to 1987, later availability of two additional years allowed us to carry out a test of post-sample adequacy of the fitted models. These results indicate that the models that include the female employment variable are better able to track accurately the behavior of the homicide rate in the late eighties.

Figure 2 shows graphically the magnitude of the unemployment and female employment effects on homicide. The figure illustrates the effect on the homicide rate of one percentage point increases in both unemployment and female employment rates, for

---

[7] This would seem to support Silberman's view that "[t]he most compelling reason for going straight is that young men fall in love and want to marry and have children; marriage and the family are the most effective correctional institutions we have" (Silberman, 1978: quoted in Bayley, 1985: 113). For a more fully theorised view of the importance of marriage in crime control see Braithwaite (1989: 90-2).

different models. Model 1 shows that using the conventional approach, which excludes female employment, there is only a small increase in crime as a result of higher total unemployment. This effect jumps markedly in the same model for which there is control for the female employment rate.

Figure 2 shows changes in the homicide rate from changes, respectively, in the total male and female unemployment rates. Most noticeably, it is clear that female employment rate changes have a consistently large influence on crime, and that the inclusion of this variable increases statistically the effect of unemployment

TABLE 2 and FIGURE 2 about here

It appears, then, that our respecification has strong statistical support. This suggests that the failure of many previous time-series studies to find a significant effect of unemployment on homicide may be a result of model misspecification through the exclusion of female employment.[8] While both unemployment and female employment are strong predictors of homicide across time in our estimations, unreported tests including both of the labor force variables are unaffected by introducing lagging. That is, the simple contemporaneous estimations seem to be the most trustworthy.

As noted with reference to Figure 2, models 3 and 5 (Table 1) show that if we consider separately the effects of male and female unemployment on homicide, the theory is supported in both cases. Both male unemployment (model 3) and female unemployment (model 5) have insignificant effects on homicide before female employment is added to the model. Clearly, the effects of both male and female unemployment become significant when the female employment effect is added to the model. The increase in the effect of female unemployment on crime is particularly marked after controlling for female employment.

---

[8] If we attempt to solve this problem by using male employment instead of female employment, we do not get the significant labor force effects that we get in our preferred specification.

The fundamental conclusion from the statistical analysis is that female employment appears to be a significant determinant of homicides. Moreover, once this variable is included in the regression analysis, the unemployment rate assumes the role usually found in individual-level and cross-sectional analyses. As an illustration, from Model 4 the magnitude of the effects discovered is that a one percentage point increase in female employment leads to a 0.74 percentage point increase in the homicide rate while the corresponding impact of a change in male unemployment is equal to 0.27.

IV POLICY IMPLICATIONS

From our data, it is apparent that male unemployment and female unemployment cause crime. Those who have suggested that the theory of unemployment causing crime may be a theory only applicable to males (Naffine and Gale, 1989) have that view seriously questioned by these data. Here we might note also Chiricos's (1987: 196) review finding that studies that test the effect of male-specific unemployment rates are, if anything, *less* likely to generate significant positive effects on crime. We have suggested that the way to resolve the paradox of strong individual- and census tract-level but weak time-series support for the unemployment-homicide association is to add female employment to the time-series models.

Across the twentieth century in Australia, rising female employment has been associated with rising crime. This is consistent with our thesis that when women go to work in increasing numbers in a patriarchal society, the slack in gendered supervisory responsibilities is not taken up by men or other social supports for working women. Criminal opportunities are increased for both women and men, and the vulnerability of women to crime increases.

There are two, completely disparate, ways to attach policy significance to our findings. One would be to conclude that policy settings which discourage women from working will be in the interests of crime control. Such public policies could include

removing state subsidies for child care, ensuring that child care expenses are not tax deductible, increasing the dependent spouse rebate paid to Australian taxpayers, increasing child endowment payments to non-working women, and setting progressive tax rates on joint family incomes instead of individual incomes. All such approaches would implicitly discourage female labor force participation.

These would be questionable policy inferences on four grounds. First, many of the policies which would be pursued in the cause of reducing female employment would be unlikely to have any significant effect on female labor supply. There is little doubt that continued increases in women's labor force participation are here for the foreseeable future. Second, any reductions in female employment might be difficult to implement without also increasing female unemployment. And we have seen that female unemployment is significantly associated with crime just as is female employment.

Third, our hypothesis is that a policy like limiting public support for quality child care centers and after-school programs might: (a) increase the disincentives for women to work; but (b) worsen the criminogenic consequences of women working in circumstances where others will not step in to share the burdens of supervising children. The obvious way to escape the horns of this crime control dilemma is to address what causes female employment to increase crime. If one of these causes is inadequate affordable child care, as we hypothesize it is, then we might pursue policies to make child care and after-school care affordable and universally available. This proposition is now explored more fully.

It is worth considering the findings of Fiala and LaFree (1988) which, though they involved different variables on a different type of data, are strikingly parallel to our own. Fiala and LaFree found a strong cross-national association between female share of the labor force and child homicide rate (see Figure 3). They also found, however, that social welfare spending and female status in the society (as measured by participation of women in tertiary education and a higher ratio of women to men in professional jobs) were associated with lower child homicide rates. From Figure 3, the societies that have a low child homicide rate even though they have relatively high female labor force participation

are the societies which fall below the line in Figure 3—the Scandinavian societies. Fiala and LaFree's (1988) data suggest that the reason Finland, Denmark and Sweden have much lower child homicide rates than one would predict from their female workforce participation is that these are societies with unusually strong commitments to family support through the welfare system and to programs which provide aid to women generally. For example, Swedish law allows either parent a six-hour workday, with income supplements until children are eight years old.[9] The high-female-employment-low-child-homicide societies are those that have taken special measures to alleviate the double burden to working women of family and wage labor.

FIGURE 3 ABOUT HERE.

Some might conclude from Figure 3 that we should seek to save the lives of children by being like the Netherlands or Italy. A feminist perspective on Figure 3 is that societies can do better by their children relative to Italy, for example, while increasing employment opportunities for women, so long as they are willing to make the commitment to social and economic support for women that Sweden and Denmark were willing to make as long ago as the 1960s (see Vesterdal, 1977).

This kind of feminist interpretation is also the best way to make sense of Gartner *et al.*'s (1990) findings on pooled cross-sectional data from 18 countries for 1950-85. They found that female homicide risks increased where women were more involved in the paid labor market. However, this turned out to be no longer the case in contexts of greater female status (measured by women's access to higher education). Similarly, a feminist perspective can make sense of Gartner and McCarthy's (1991) finding that in Canada employed women were over-represented among homicide victims prior to 1970 (a more patriarchal context), but under-represented after 1970 (a less patriarchal context). Our own data are not consistent with this Canadian finding: the post-1970 effect of female employment on homicide was bigger than the contribution of the pre-1970 employment.

---

[9] For a feminist critique of the limitations of the Swedish laws, see Widerberg (1991).

However, it is interesting to observe that the post-1970 effect is smaller than the full sample effect.

A sensible policy agenda seems therefore to research the reasons that cause an association between female employment and crime and then initiate policies to remedy these reasons. The most fundamental of these reasons, according to our theory, is patriarchy. For example, the supervision effects of female employment would not arise if men shared equally in the guardianship obligations that are currently profoundly gendered. A credible interpretation is that violent domineering men who assault working wives because, for example, they fail to have a dinner on the table (Hopkins and McGregor, 1991: 119) or because they are threatened by the resource power of their wife (Blood and Wolfe, 1960), manifest a violence which is a product of patriarchal institutions.

A more enduring solution is likely from a policy and a process of community change that addresses patriarchy than from removing immediate employment-related provocations to violent patriarchs. The fourth reason, therefore, why it is a flawed policy inference to urge a reduction in crime by getting women out of the workforce is that the destruction of patriarchy is the more long-term solution to the problem—and female employment itself is central to the political program of destroying patriarchy.

Patriarchal attitudes of domination and humiliation of women by men seem to be fundamental causes of violence in contemporary societies (Braithwaite, 1991a). It follows that the structural bases of those domineering attitudes may only be addressed by throwing into reverse the economic subordination of women. An interpretation of our results is that in achieving transition to a social structure which will be more egalitarian and therefore less criminogenic, we must suffer some crime-increasing effects of working through the transition. According to our theory, if we ever were to reach the destination where patriarchy was destroyed, it would no longer be true that increasing female employment would increase crime and we would live in a society where a potent cause of crime was eliminated.

Hence, the policy analysis we draw from our theory of male-female employment-unemployment and crime has three elements:

(a) Both male and female unemployment have adverse consequences for crime that must be weighed in any policy mix;

(b) working against patriarchy is also important because it is patriarchy that is most fundamental to enabling female employment to have a positive effect on crime (and because sexual inequality is a major direct cause of crime);

and

(c) an important way to work against patriarchy is to increase female employment.

V CONCLUSION

A sensible methodological disposition is that to be confident about a relationship one would want to see it supported at both the cross-sectional and time-series levels of analysis. This is because the potential sources of error under the two methodologies are very different. When there is a convergence, more confidence is warranted that the association is a result of true association captured under the two methodologies rather than the different sources of error that exist in the two approaches. Yet sadly, the two methodologies all too commonly give different results.

The unemployment and crime relationship has been a classic area of cross-sectional time-series irresolution. In particular, the failure of the time-series studies to support the positive unemployment-crime association has been especially acute with: time-series that include the Great Depression, studies of homicide, and time-series conducted in Australia. Our study has confronted the worst case scenario that includes these three features.

Consistent with these results, we fail to find a significant unemployment effect on homicide across time using the conventional approach. However, by adding female employment to the model it seems possible to resolve the paradox of unemployment and

crime. The effect of either male or female unemployment becomes larger and more significant after adding female employment to the model. Female employment is associated with higher homicide rates. Thus, female employment changes across time in a way that masks the positive effect of female unemployment and male unemployment on crime.

The paper shows the importance of theory in guiding the resolution of conflicts between time-series findings and results from other levels of analysis. It does not, however, provide even the beginnings of a systematic test of the theory we have advanced. Our purpose in this paper has been merely to give some sense of how the way we understand the effect of unemployment on crime is likely to undergo major transformation if we think in terms of gendered labor markets in which employment is not the obverse of unemployment. This purpose has been joined at three different levels—theoretically, through a consideration of the supervision, opportunity and vulnerability effects of female employment; empirically, by showing how a respecification suggested by such a theory can uncover employment-unemployment effects that were previously masked; and policy analytically, by showing how a feminist analysis of labor markets and crime must confront new paradoxes. We hope to have hinted at how a feminist policy analysis can indeed grapple with these new paradoxes. Ultimately, we think that the effect of sexual inequality on crime is at least as important and practical a policy debate as the debate on the effect of employment on crime. What is more, we have shown here that they are inextricably related debates.

REFERENCES

Adler, F

1975 Sisters in Crime: The Rise of the New Female Criminal. New York: McGraw-Hill.

Alder, Christine

1985 'Theories of female delinquency'. In A. Borowski and J.M. Murray (eds.), Juvenile Delinquency in Australia. Sydney: Methuen.

Alder, Christine

1986 '"Unemployed women have got it heaps worse": exploring the implications of female youth unemployment'. Australian and New Zealand Journal of Criminology 19: 210-24.

Allen, Craig M. and Murray A. Strauss

1980 'Resources, power, and husband-wife violence'. In M. A. Strauss and G.T. Hotaling (eds.), The Social Causes of Husband-Wife Violence. Minneapolis: University of Minnesota Press.

Allison, J.P.

1972 'Economic Factors and the Rate of Crime'. Land Economics 68: 193-6.

Archer, Dane and Rosemary Gartner

1986 'Violence and the Economy: A Modest Hypothesis on Inequality, Unemployment and Crime'. International Annals of Criminology 24: 255-65.

Australian Bureau of Statistics

1986 Victims of Crime, Australia 1983. Canberra: Australian Bureau of Statistics.

Baxter, J. and D. Gibson, with M. Lynd-Blossa

1990 Double Take: The Links Between Paid and Unpaid Work. Canberra: Australian Government Publishing Service.

Bayley, D.H.

1985 Social Control and Political Change, Research Monograph No. 49. Woodrow Wilson School of Public and International Affairs, Princeton University.

Bechdolt, B.V.

1975 'Cross-Sectional Analysis of Socioeconomic Determinants of Urban Crime'. Review of Social Economy 33: 132-40.

Becker, Gary S.

1968 'Crime and punishment: an economic approach'. Journal of Political Economy 76: 169-217.

Belknap, Joanne

1989 'The economics-crime link'. Criminal Justice Abstracts March: 140-57.

Blood, Robert O. and Donald M. Wolfe

1960 Husbands and Wives: The Dynamics of Married Living. New York: Free Press.

Bloom, B.L.

1966 'A Census Tract Analysis of Socially Deviant Behavior'. Multivariate Behavioral Research 1: 307-20.

Boritch, Helen and John Hagan

1990 'A century of crime in Toronto: gender, class, and patterns of social control, 1859 to 1955'. Criminology: 28: 567-600.

Box, Steven

1987 Recession, Crime and Punishment. London: Macmillan.

Box, Steven and Chris Hale

1983 'Liberation and female criminality in England and Wales'. British Journal of Criminology 23: 35-49.

Braithwaite, John

1978 'Unemployment and crime: an interpretation of the international evidence'. In Unemployment and Crime. Proceedings of the Institute of Criminology, No. 36: University of Sydney.

Braithwaite John,

1979 Inequality, Crime and Public Policy. London: Routledge and Kegan Paul.

Braithwaite, John

1980 Prisons, Education and Work: Towards a National Employment Strategy for Prisoners. Brisbane: University of Queensland Press.

Braithwaite, John

1989 Crime, Shame and Reintegration. Cambridge: Cambridge University Press.

Braithwaite, John

1991a 'Poverty, power, white-collar crime and the paradoxes of criminological theory'. Australian and New Zealand Journal of Criminology. 1-19.

Braithwaite, John and David Biles

1979 'On being unemployed and being a victim of crime'. Australian Journal of Social Issues 14: 192-200.

Braithwaite, John, David Biles and Ray Whitrod

1982 'Fear of Crime in Australia'. In H.J. Schneider (ed.), The Victim in International Perspective. Berlin: Walter de Gruyter.

Braithwaite John and Valerie Braithwaite.

1980 'The Effect of Income Inequality and Social Democracy on Homicide'. British Journal of Criminology 20: 45-53.

Brennan, Deborah

1987 'Daycare, Kindergarten or Mothercare: Commonwealth Funding for Children's Services'. Canberra: Public Policy Case Study Library: Case Study No. 10, 1987.

Broom, Dorothy H. (ed.)

1984 Unfinished Business: Social Justice for Women in Australia. Sydney: Allen & Unwin.

Brown, Bruce

1980 'Wife-Employment, Marital Equality, and Husband-Wife Violence'. Pp.176-87. In M.A. Straus and G.T. Hotaling (eds.), The Social Causes of Husband-Wife Violence. Minneapolis: University of Minnesota Press.

Brownfield, David

1986 'Social class and violent behavior'. Criminology 24: 421-38.

Cameron, M.A.

1964 The Booster and the Snitch: Department Store Shoplifting. Glencoe, Ill: Free Press.

Cantor, David and Kenneth C. Land

1985 'Unemployment and crime rates in the post-world War II United States: a theoretical and empirical analysis'. American Sociological Review 50: 317-32.

Carrol, R.M. and P.I. Jackson

1983 'Inequality, Opportunity and Crime Rates in Central Cities'. Criminology 21: 178-94.

Challinger, D.

1982 'Crime, Females and Statistics'. Australian and New Zealand Journal of Criminology 15: 123-8.

Chapman, Bruce

1990 'The Labor Market'. In Stephen Grenville (ed.), The Australian Macro-Economy in the 1980s. Reserve Bank of Australia, Sydney, 11-75.

Chiricos, T.G.

1987 'Rates of Crime and Unemployment: An Analysis of Aggregate Research Evidence'. Social Problems 34: 187-212.

Clinard, M.B. and D.J. Abbott

1973 Crime in Developing Countries: A Comparative Perspective. New York: Wiley.

Cohen, Lawrence E. and Marcus Felson

1979 'Social change and crime rate trends: A routine activity approach'. American Sociological Review 44: 588-608.

Cohen, Lawrence E., James R. Kluegel and Kenneth C. Land

1981 'Social Inequality and predatory criminal victimization: an exposition and test of a formal theory'. American Sociological Review 46: 505-24.

Cohen, Lawrence E. and Kenneth C. Land

1987 'Age structure and crime: Symmetry versus asymmetry and the projection of crime rates through the 1990s'. American Sociological Review 52: 170-83.

Cook, Philip, J. and Gary A. Zarkin

1985 'Crime and the business cycle'. Journal of Legal Studies XIV:115-29.

Danziger, S.

1976 'Explaining Urban Crime Rates'. Criminology.14: 291-5.

Danziger, S. and D. Wheeler

1975 'The Economics of Crime: Punishment or Income Redistribution'. Review of Social Economy 33: 113-31.

DeFronzo, James

1983 'Economic assistance to impoverished Americans'. Criminology 21: 119-36.

Devery, Christopher

1992 Domestic Violence in NSW: A Regional Analysis. Sydney: New South Wales Bureau of Crime Statistics and Research.

Dickey, D.A. and W.A. Fuller

1979 'Distribution of the Estimators for Autoregressive Time Series with a Unit Root'. Journal of the American Statistical Association 74 (366): 427-431.

Dickey, D.A. and W.A. Fuller

1981 'Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root'. Econometrica 49(4): 1057-1072.

Duster, Troy

1987 'Crime, youth unemployment, and the black urban underclass'. Crime and Delinquency 33: 300-316.

Eckstein, Harry

1975 'Case study and theory in political science'. In F. Greenstein and N. Polsby (eds.), Handbook of Political Science, Volume 7: Strategies of Inquiry. Reading, Mass.: Addison-Wesley.

Ehrlick, Isaac

1973 'Participation in illegitimate activities: a theoretical and empirical investigation'. Journal of Political Economy 81: 521-65.

Engels, F.

1969 The Condition of the Working Class in England in 1844. Harmondsworth: Penguin.

Engle, R.F. and C.W.J. Granger

1987 'Cointegration and Error Correction Representation, Estimation, and Testing'. Econometrica 55 (2): 251-276.

Farrington, D.P., B. Gallagher, L. Morley, R.J. St Ledger and D.J. West

1986 'Unemployment, School Leaving and Crime'. British Journal of Criminology 26: 335-56.

Federal Bureau of Investigation (FBI)

1985 Crime in the United States, 1984. Washington, D.C.: US Department of Justice.

Fiala, Robert and Gary LaFree.

1988 'Cross-National Determinations of Child Homicide'. American Sociological Review 53: 432-45.

Fleisher, B.M.

1966 The Economics of Delinquency. Chicago: Quadrangle Books.

Fox, James A.

1978 Forecasting Crime Data. Lexington, MA: Lexington Books.

Garbarino, James

1976 'A Preliminary Study of Some Sociological Correlates of Child Abuse: the Impact of Socioeconomic Stress on Mothers'. Child Development 47: 178-85.

Gartner, Rosemary

1990 'The victims of homicide: a temporal and cross-national comparison' American Sociological Review 55: 92-106.

Gartner, Rosemary, Kathryn Baker and Fred C. Pamsel

1990 'Gender Stratification and the Gender Gap in Homicide Victimization'. Social Problems 37: 593-612.

Gartner, Rosemary and Bill McCarthy

1991 'The Social Distribution of Femicide in Urban Canada, 1921-1988'. Law and Society Review 25: 287-312.

Gianapolis, Artie and Howard E. Mitchell

1957 'Marital disagreements in working wife marriages as a function of husband's attitudes toward wife's employment'. Marriage and Family Living 17: 373-78.

Gil, David

1970 Violence Against Children: Physical Child Abuse in the United States. Cambridge: Harvard University Press.

Gillespie, Robert W.

1978 'Economic factors in crime and delinquency: a critical review of the empirical evidence'. Pp. 601-26. In Unemployment and Crime Hearings Before the Subcommittee on Crime of the Committee on the Judiciary. House of Representatives. Washington, CC: U.S. Government Printing Office.

Glazer-Malbin, Nona

1975 'Man and woman: interpersonal relationships in the marital pair'. New York: D. Van Nostrand.

Gottfredson, Michael R. and Travis Hirschi

1990 A General Theory of Crime. Stanford: Stanford University Press.

Grabosky, Peter

1977 Sydney in Ferment. Canberra: Australian National University Press.

Grabosky, Peter and John Braithwaite

1986 Of Manners Gentle: Enforcement Strategies of Australian Business Regulatory Agencies. Melbourne: Oxford University Press.

Greenberg, D.F.

1985 'Age, Crime and Social Explanation'. American Journal of Sociology 91: 1-21.

Gurr, T.R., P.N. Grabosky and R.C. Hula

1977 The Politics of Crime and Conflict: A Comparative History of Four Cities. Beverley Hills: Sage.

Hale, Chris

1989 'Unemployment, Imprisonment and the Stability of Punishment Hypothesis: Some Results Using Cointegration and Error Correction Models'. Journal of Quantitative Criminology 5: 169-186.

Hale, C. and D. Sabbagh

1991 'Testing the relationship between unemployment and crime: a methodological comment and empirical analysis using time series data from England and Wales'. Journal of Research in Crime and Delinquency 28: 400-417.

Hansmann, Henry B. and John M. Quigley

1982 'Population Heterogeneity and the Sociogenesis of Homicide'. Social Forces 61: 206-224.

Hemley, D.D. and L.R. McPheters.

1974 'Crime as an Externality of Regional Economic Growth'. Review of Regional Studies 4: 73-84.

Henry, A.F. and J.F. Short

1954 Suicide and Homicide: Some Economic, Sociological and Psychological Aspects of Aggression. New York: Free Press.

Hindelang, M.J., M.R. Gottfredson. and J. Garofalo

1978 Victims of Personal Crime: An Empirical Foundation for a Theory of Personal Victimization..Cambridge, Mass.: Ballinger.

Holtman, A.G. and L. Yap

1978 'Does punishment pay?' Public Finance 33: 90-97.

Hopkins, Andrew and Heather McGregor

1991 Working for Change: The Movement Against Domestic Violence. Sydney: Allen and Unwin.

Jiobu, R.M.

1974 'City Characteristics and Racial Violence'. Social Science Quarterly 55: 52-64.

Katz, Jack

1988 Seductions of Crime: Moral and Sensual Attractions of Doing Evil. New York: Basic Books.

Keating, M.

1973 'The Australian Workforce 1910/11 to 1960/61'. Canberra: Department of Economic History, RSSS, Australian National University

Kolb, Trudy M. and Murray A. Strauss

1974 'Marital power and marital happiness in relation to problem-solving ability'. Journal of Marriage and the Family 36: 756-66.

Kraus, John

1978 'Juvenile unemployment and delinquency'. In Unemployment and Crime. Proceedings of the Institute of Criminology, No. 36. University of Sydney.

Krohn, M.D.

1976 'Inequality, Unemployment and Crime: A Cross-National Analysis'. Sociological Quarterly 17: 303-313.

LaFree, Gary and Edward Kick

1986 'Cross-National Effects of Developmental, Distributional, and Demographic Variables on Crime: A Review and Analysis'. International Annals of Criminology 24: 213-235.

Land, Kenneth C., David Cantor and Stephen Russell

1992 'Unemployment and crime rate fluctuations in the post-world war II United States: Statistical time series properties and alternative models'. Unpublished manuscript, Duke University.

Land, Kenneth C., Patricia L. McCall and Lawrence E. Cohen

1990 'Structural Covariates of Homicide Rates: Are There Any Invariances Across Time and Social Space?' American Journal of Criminology 95: 922-963.

Light, Richard J.

1974 Abused and Neglected Children in America: A Study of Alternative Policies'. Harvard Educational Review 43: 556-598.

Long, Sharon K. and Anne D. Witte

1981 'Current economic trends: implications for crime and criminal justice'. Pp. 69-143. In Kevin N. Wright (ed.), Crime and Criminal Justice in a Declining Economy. Cambridge, MA: Oelgeschlager, Gunn and Hain.

McDonald, L.

1976 The Sociology of Law and Order, Boulder, Colorado: Westview Press.

McGarrell, E.G. and T.J. Flanagan

1985 Sourcebook of Criminal Justice Statistics—1984. Washington, D.C.: US Department of Justice.

Martin, J., M.K. Rook and P. Filton

1979 Trends in Prison Population in Victoria. Melbourne: Department of Community and Welfare Services.

Mendershausen, H.

1946 Changes in Income Distribution During the Great Depression. New York: National Bureau of Economic Research.

Messerschmidt, James W.

1986 Capitalism, Patriarchy and Crime: Toward a Socialist Feminist Criminology. Totowa: Rowman and Littlefield.

Messner, Steven F.

1986 'Modernization, Structural Characteristics, and Societal Rates of Crime: An Application of Blau's Macrosociological Theory'. Sociological Quarterly 27: 27-41.

Miethe, Terance D., Mark C. Stafford and J. Scott Long

1987 'Social Differentiation in Criminal Victimization: a test of routine activities lifestyle theories'. American Sociological Review 52: 184-94.

Mukherjee, Satyanshu K.

1981 Crime Trends in Twentieth-Century Australia, Sydney: Allen and Unwin.

Mukherjee, Satyanshu K and Dianne Dagger

1991 The Size of the Crime Problem in Australia. Canberra: Australian Institute of Criminology.

Mukherjee, S.K., F. Debaecker, A. Scandia, D. Dagger and W. Matthews

1989 Source Book of Australian Criminal and Social Statistics 1804-1988. Canberra: Australian Institute of Criminology.

Mukherjee, Satyanshu K. and R.W. Fitzgerald

1981 'The Myth of Rising Female Crime'. In S.K. Mukherjee and J.A. Scutt (eds.), Women and Crime,.Sydney: Allen and Unwin.

Naffine, Ngaire and Fay Gale

1989 'Testing the Nexus: Crime, Gender, and Unemployment'. British Journal of Criminology 29: 144-156.

Nye, F. Ivan

1958 'Employment status of mothers and marital conflict, permanence, and happiness'. Social Problems 6: 260-267.

Nye, F. Ivan

1963 'The adjustment of adolescent children'. I in F. Ivan Nye and W. Hoffman (eds.), The Employed Mother in America. Chicago: Rand McNally.

Orsagh, Thomas

1980 'Unemployment and crime: an objection to Professor Brenner's view'. Journal of Criminal Law and Criminology 71: 181-83.

Pagan, A.R. and G.W. Schwert

1990 'Testing for Covariance Stationarity in Stock Market Data'. Economics Letters, 33(2): 165-170.

Parisi, N., Gottfredson, M.R., Hindeland, M.J. and Flanagan, T.J. (eds.)

1979 Sourcebook of Criminal Justice Statistics 1978. Washington, D.C.: US Government Printing Office.

Polk, Ken and Ranson, D.D.

1991 'Homicide in Victoria'. In D. Chappell, P. Grabosky and H. Strang (eds.), Australian Violence: Contemporary Perspectives. Canberra: Australian Institute of Criminology.

Presdee, Mike

1982 'Invisible girls: a study of unemployed working class young women'. Paper to Tenth World Congress on Sociology, Mexico City.

Sampson, R.J. and J.D. Wooldredge

1987 'Linking the Micro and Macro Levels of Lifestyle-Routine Activity and Opportunity Models of Predatory Victimization'. Journal of Quantitative Criminology 3: 371-393.

Scheff, Thomas J., Suzanne M. Retzinger and Michael T. Ryan

1989 'Crime, Violence and Self-Esteem: Review and Proposals'. In A. Mecca, N. Smelser and J. Vasconcellos (eds.), The Social Importance of Self-Esteem. Berkeley: University of California Press.

Schuessler, K.F. and G. Slatin

1964 'Sources of Variation in US City Crime, 1950 and 1960'. Journal of Research in Crime and Delinquency 1: 127-148.

Scutt, Jocelynne

1980 'Crime and sexual politics'. In E. Windschuttle (ed.), Women, Class and History. Melbourne: Fontana.

Scutt, Jocelynne

1983 Even in the Best of Homes: Violence in the Family. Ringwood: Penguin.

Sellin, T.

1937 Research Memorandum on Crime in the Depression. New York: Social Science Research Council Bulletin No.27.

Shaw, C.R. and H.D. McKay

1969 Juvenile Delinquency and Urban Areas. Chicago: University of Chicago Press.

Sherman, Lawrence W., Patrick R. Gartin and Michael E. Buerger

1989 'Hot spots of predatory crime: routine activities and the criminology of place'. Criminology 27: 27-55.

Silberman, C.E.

1978 Criminal Violence, Criminal Justice. New York: Random House.

Singell, L.D.

1968 'Economic Causes of Delinquency: National Versus Local Control'. Urban Affairs Quarterly 4: 225-233.

Sjoquist, David L

1973 'Property crime and economic behavior: some empirical results'. American Economic Review 63: 439-446.

Smart, Carol

1979 'The new female offender: Reality or myth?' British Journal of Criminology 19: 50-59.

Sommers, Paul M.

1982 'Deterrence and gun control: a reply'. Atlantic Economic Journal 10: 54-57.

South Australian Office of Crime Statistics

1979 Crime and Justice in South Australia: Quarterly Report for the Period Ending 31 December, 1978. Adelaide: South Australian Office of Crime Statistics.

South Australian Office of Crime Statistics

1980(a) Robbery in South Australia. Adelaide: South Australian Office of Crime Statistics.

South Australian Office of Crime Statistics

1980(b) Statistics from Courts of Summary Jurisdiction, Series II, No.4. Adelaide: Attorney-General's Department.

Spector, P.E.

1975 'Population Density and Unemployment: The Effects on the Incidence of Violent Crime in the American City'. Criminology 12: 399-401.

Stanko, Elizabeth

1990 Everyday Violence: How Women and Men Experience Sexual and Physical Danger. London: Pandora.

Steffensmeier, Darrell J.

1981 'Crime and the contemporary women: An analysis of changing levels of female property crime, 1960-1975'. In L.H. Bowker (ed.), Women and Crime in America. New York: Macmillan.

Steffensmeier, Darrel J. and R. H. Steffensmeier

1980 'Trends in female delinquency'. Criminology 18: 62-85.

Stotland, Ezra

1976 'Self-Esteem and Violence by Guards and Troopers at Attica' .Criminal Justice and Behavior 3: 85-96.

Stotland, Ezra and J. Martinez

1976 'Self-Esteem and Mass Violence at Kent State'. International Journal of Group Tensions 6: 85-96.

Teal, Francis

1990 'The Use and Cost of Child Care in Australia'. Centre for Economic Policy, Australian National University. Research Discussion Paper No. 236.

Tittle, C.R., Villemez, W.J. and D.A. Smith

1978 'The Myth of Social Class and Criminality: An Empirical Assessment of the Empirical Evidence'. American Sociological Review 43: 643-656.

Van Dijk, J.J., Pat Mayhew and Martin Kilias

1990 Experiences of Crime Across the World: Key Findings of the 1989 International Crime Survey. Deventer, Netherlands: Kluwer.

Vesterdal, Jorgen

1977 'Handling Child Abuse in Denmark'. Child Abuse and Neglect 2:193-198.

Vinson, T. and R. Homel

1972 The Coincidence of Medical and Social Problems Throughout a Region. Sydney: New South Wales Bureau of Crime Statistics and Research.

Vold, G.B.

1958 Theoretical Criminology. New York: Oxford University Press, 164-181.

Wadycki, Walter J. and Steven Balkin

1979 'Participation in illegitimate activities: Forst's model revisited'. Journal of Behavioural Economics 8: 151-63.

Walker, John

1991 Trends and Issues No. 28: Understanding Crime Trends in Australia. Canberra: Australian Institute of Criminology.

Wallace, A

1986 Homicide: The Social Reality. Sydney: New South Wales Bureau of Crime Statistics and Research.

Wearing, Rosemary

1990 'Research Project 9/88: A longitudinal analysis of the 1987 Crimes (Family Violence) Act in Victoria'. Report to the Criminology Research Council. Canberra: Criminology Research Council.

Whitehurst, Robert N.

1974 'Violence in husband-wife interaction'. In S.K.Steinmetz and M.A. Strauss (eds.), Violence in the Family. New York: Harper and Row.

Widerberg, Karin

1991 'Reforms for women—on male terms—the example of the Swedish Legislation on parental leave'. International Journal of the Sociology of Law 19: 27-44.

Wiers, Paul

1944 Economic Factors in Michigan Delinquency. New York: Columbia University Press.

Williams, Kirk R. and Susan Drake

1980 'Social structure, crime and criminalization: an empirical examination of the conflict perspective'. Sociological Quarterly 21: 563-575.

Wilson, J.Q., and R. Herrnstein

1985 Crime and Human Nature. New York: Simon and Schuster.

Wilson, Paul R., John Braithwaite and Anne Guthrie

1975 Latch-Key Children in Queensland: Report to the Australian Commission of Enquiry into Poverty. Canberra.

Windschuttle, Keith

1979 Unemployment: A Social and Political Analysis of the Economic Crisis in Australia. Ringwood: Penguin.

Withers, Glenn

1984 'Crime, Punishment and Deterrence in Australia: An Empirical Investigation'. Economic Record 60: 176-185.

Wolfe, N.T., Cullen, F.T. and J.B. Cullen

1984 'Describing the Female Offender: A Note on the Demographics of Arrests'. Journal of Criminal Justice 12: 483-492.

APPENDIX A: VARIABLES' DEFINITIONS AND SOURCES.

Total homicides per 1 million people.

Source: [MSDM], [Australian Bureau of Statistics (ABS) 3303.0]—homicides.
[MSDM], [ABS 3102.0, 3201.0] — population.

Total, male & female unemployment rates.

Source: [Keating], [LR 51], [LR 52]
[CBCS 6.22], [ABS 6204.0]
[ABS 6203.0]—for both the unemployment level and the labor force level.

Total and female employment/population rates

Source: employment : as for unemployment rate/population : as for homicides.

Total number of marriages divided by total population

Source: [MSDM], [ABS 3306.0]—marriages population : as for homicides.

Total number of divorces divided by total population.

Source: [MSDM], [ABS 3307.0]—divorces population: as for homicides.

Urbanization in population of capital cities (excluding Darwin) divided by total population

Source: [ABS 3101.0], [ABS 3102.0]
[CBCS—QSAS] — metropolitan population total population: as for homicides.

18-24 years old divided by total population

Source: [MSDM], [ABS 3201.0] males 18-24 total population: as for homicides.

Gross Domestic Product in 1984/85 Prices

Source: [MSDM], [ABS 5206.0]

Total number of motor vehicles on register divided by total population

Source: [MSDM], [CBCS—1926],
[ABS Yearbook]

[MSDM] S.K. Mukherjee, A. Scandia, D. Dagger, W. Matthews, 'Source Book of Australian Criminal and Social Statistics 1804-1988. Bicentennial Edition'. Australian Institute of Criminology, Canberra, 1989.

[ABS 3303.0] 'Causes of Death, Australia'. Australian Bureau of Statistics Canberra. Catalogue No. 3303.0.

[ABS 3102.0] Australian Bureau of Statistics, 'Australian Demographic Trends, 1986'. ABS Cat. No. 3102.0.

[ABS 3201.0] ABS, 'Estimated Resident Population by sex and age, States and Territories of Australia'. ABS Cat. No. 3201.0.

[ABS 6203.0] ABS, 'The Labor Force, Australia'. ABS Cat. No.6203.0.

[ABS 3306.0] ABS, 'Marriages, Australia'. ABS Cat. No.3306.0.

[ABS 3307.0] ABS, 'Divorces, Australia'. ABS Cat. No. 3307.0.

[CBCS—QSAS] CBCS, 'Quarterly Summary of Australian Statistics'. Melbourne.

[ABS 3101.0] ABS, 'Quarterly Summary of Australian Statistics'. ABS Cat. No. 3101.0, Canberra.

[ABS 5206.0] ABS, 'Australian National Accounts. National Income & Expenditure'. ABS Cat. No. 5206.0, Canberra.

[Keating] M. Keating, 'The Australian Workforce 1910/11 to 1960/61'. Department of Economic History, RSSS, Australian National University, Canberra, 1973.

[LR51, LR52] Commonwealth Bureau of Census and Statistics, Labor Report No.51 (1964) and No.52 (1965-66), Canberra.

[CBCS 6.22] Commonwealth Bureau of Census and Statistics, 'The Labor Force,1964-1968. Historical Supplement to 'The Labor Force (Ref. No.6.20)"'. CBCS Reference No.6.22, Canberra.

[ABS 6204.0] ABS, 'The Labor Force, Australia. (Including Revised Estimates for August 1966)'. ABS Cat.No. 6204.0.

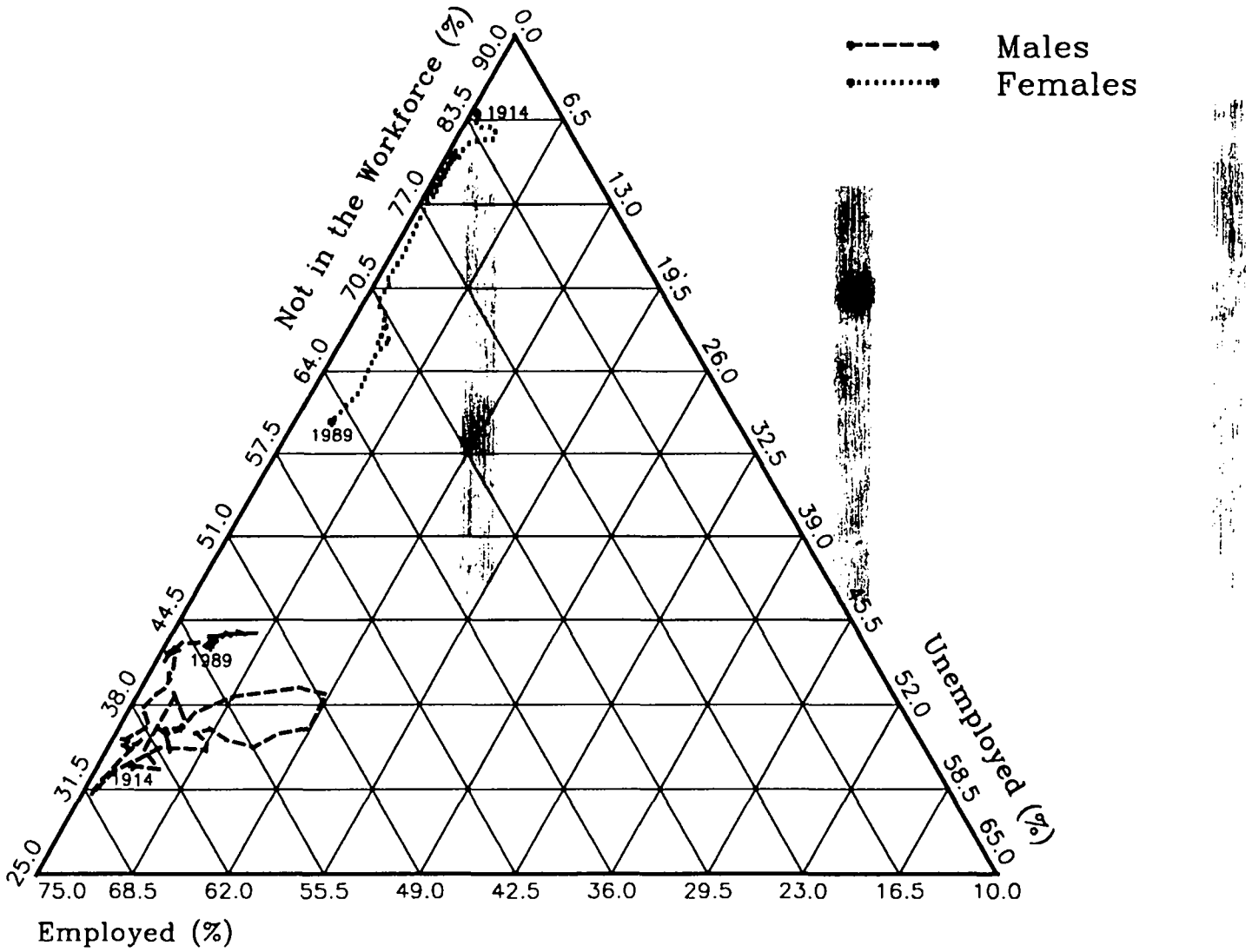
[CBCS—1926] CBCS, 'Official Yearbook of the Commonwealth of Australia, 1926 (No.19)'. Melbourne.

[ABS—Yearbook] ABS, 'Yearbook, Australia'. ABS Cat.No.1301.0, Canberra.

APPENDIX B: THE CHANGING COMPOSITION OF THE LABOUR FORCE

Figure 4 illustrates the changes in the labour force participation by both males and females. The triangular graphical presentation is especially useful in this context since the three shares of people outside the labour force, the unemployed and the employed sum to 100 per cent and one of the properties of an equilateral triangle is the constancy of the sum of perpendiculars from a point to the three sides of the triangle. Thus, with the perpendiculars being proportional to the shares, one can immediately determine both the size and the direction of any structural changes occurring in the labour market. In particular, males in Australia experienced large but temporary shifts between the states of employment and unemployment over time but made relatively slow movement towards the category of "Not in the Workforce" (from 33 per cent in 1914 to 42 per cent in 1989). Females, on the other hand, steadily increased their participation in the labour force over our sample period. They more than doubled their employment share (from 15 per cent to 37 per cent) while their unemployment share increased over six-fold over the same period (from 0.4 per cent to 2.5 per cent).

Figure 4: The employment status of population: 1914 – 1989



APPENDIX C: PRELIMINARY ECONOMETRIC ANALYSIS OF THE TIME SERIES OF HOMICIDES AND THE LABOUR MARKET INDICATORS.

Given the importance of difference-stationarity of major macro-economic time series it is worthwhile to investigate the stationarity properties of the basic series of interest in this study, *i.e.* the homicide rate and the unemployment and employment series. Since the non-stationarity of time series may contribute to the problem of spurious regression (see Engle and Granger (1987)) it can significantly alter tests of hypotheses concerning the impact of unemployment on homicides. In addition, series which exhibit different stationarity properties cannot be related by any equilibrium constraint in the long-run, while their short-run relationship will be of a spurious nature. The economic interpretation of different stationarity properties would imply distinct and unrelated factors influencing the movements of homicides and unemployment through time.

Following Pagan and Schwert (1990), we have carried out tests of covariance stationarity of the variances of the homicides, employment and unemployment series. First, splitting the sample into two equal parts allows us to carry out a "post-sample prediction test". The results, given in the table below, indicate some instability for the homicide variable but only in one partition of the sample period and at a low level of significance. The interesting point, however, is that the lack of rejection of instability when World War II is included in the second subsample indicates the possibility of a structural break between the great depression and the beginning of the war. The second test recommended by Pagan and Schwert, the CUSUM tests, on the other hand, provided no rejections of stability for any of the series of interest. (Details are available on request.)

Periods	*Variable*			
	Homicide rate	*Male unemployment*	*Female unemployment*	*Female employment*
1923-39 vs. 1940-56	0.093	0.273	-0.300	0.031
1923-45 vs. 1946-67	-1.704	-1.333	-1.427	-0.459
1924-55 vs. 1956-87	-0.966	-0.880	-1.562	0.715

Note: Test statistics are normally distributed.

To evaluate the unit-root stationarity of each of the basic variables we have employed three statistics proposed by Dickey and Fuller (1979, 1981): $t_{\hat{\rho}}$, Φ_2 and Φ_3. These statistics test for the presence of a unit root and allow for the possibility of a drift and a deterministic trend in the series. For each statistic the rejection of the null hypothesis implies the stationarity of the tested series. The results of testing for the unit root, are presented in the first three columns of the following table. The three tests all suggest that we cannot reject the null hypothesis of non-stationarity at even a 10 per cent significance level and, therefore, these variables are integrated of the first order (*i.e.* they possess similar time-series characteristics). In addition, the table also

presents the autocorrelation functions of the residuals of the optimal specification of the Dickey-Fuller equations, which confirm the white noise assumption.

Variable	*Test*			*Dickey-Fuller equation*				
	$\hat{\tau}_\rho$	Φ_2	Φ_3	*AR*	*Autocorrelation function at lag*			
				order	*1*	*2*	*3*	*4*
Homicide rate	-1.811	1.791	2.651	2	0.02	-0.45	-0.66	0.17
Male unemployment	-1.838	1.241	1.856	1	0.43	-1.25	0.65	-0.81
Female unemployment	-1.311	0.778	1.039	4	0.18	0.17	0.00	-0.18
Female employment	-2.593	3.343	3.524	6	-0.17	0.19	-0.18	-0.22

Notes:

1) The critical values for the three tests of stationarity are given in Fuller (1976: 373) and Dickey and Fuller (1981: 1063). For a sample size of 50 and at 1%, 5% and 10% significance level these values are -4.15, -3.50 and -3.18 for $\hat{\tau}_\rho$, 7.02, 5.13 and 4.31 for Φ_2 and 9.31, 6.73 and 5.61 for Φ_3.
2) The numbers in the column headed "AR order" indicate the selected autoregressive representation of the differences of each variable in the Dickey-Fuller regression.
3) Entries for the autocorrelation functions are the *t*-statistics of the first four lags.

As a final step in these preliminary investigations we have tested for cointegration among the basic variables of this study. Given that any long-term relationship may exist only among cointegrated variables, such tests may provide some answers for the inadequate results of earlier studies utilizing time-series data. In fact, a rejection of cointegration implies that the long-term trends of the homicide rate and the labour force variables are not related by any equilibrium constraint and their short-run variations could only be spuriously related. The question of paramount interest in this context is whether the homicide variable and the unemployment variable form a cointegrating relationship even when the female employment variable is excluded. The results, presented in the table below, provide a further support of our hypothesis since only in the presence of the female employment variable do the homicide rate and the traditionally used unemployment variable (*i.e.* male or total rate) form a cointegrating relationship.

Status of female employment variable	*Unemployment variable*		
	Males	*Females*	*Persons*
Excluded	-1.45	-3.03	-2.14
Included	-3.12	-3.69	-3.28

Note: The approximate critical value for the Dickey-Fuller test of non-stationarity (*i.e.* no cointegration) at 1% significance level is-2.60.

Figure 1: Homicides, female employment and unemployment:
1915 - 1987.

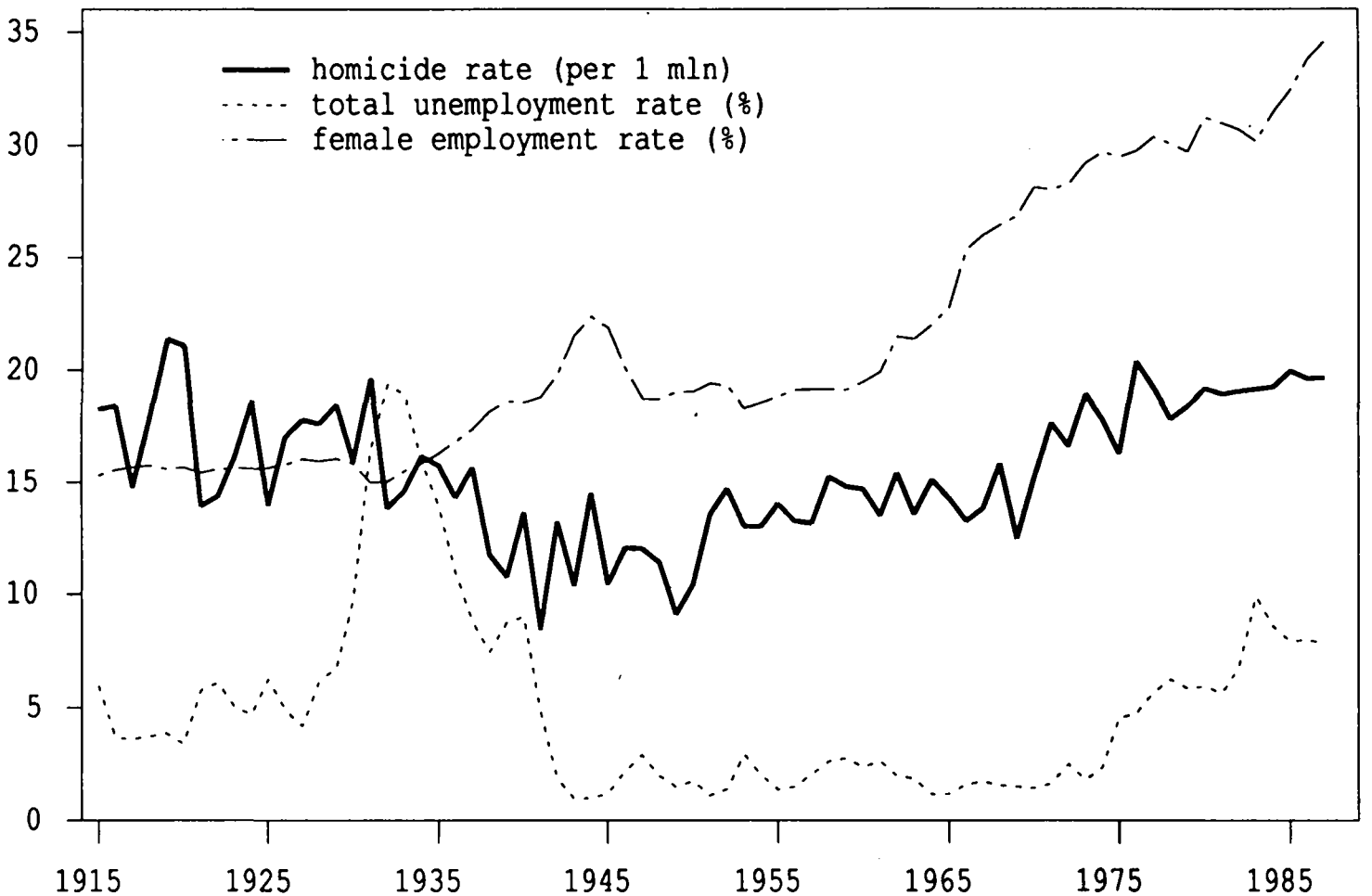
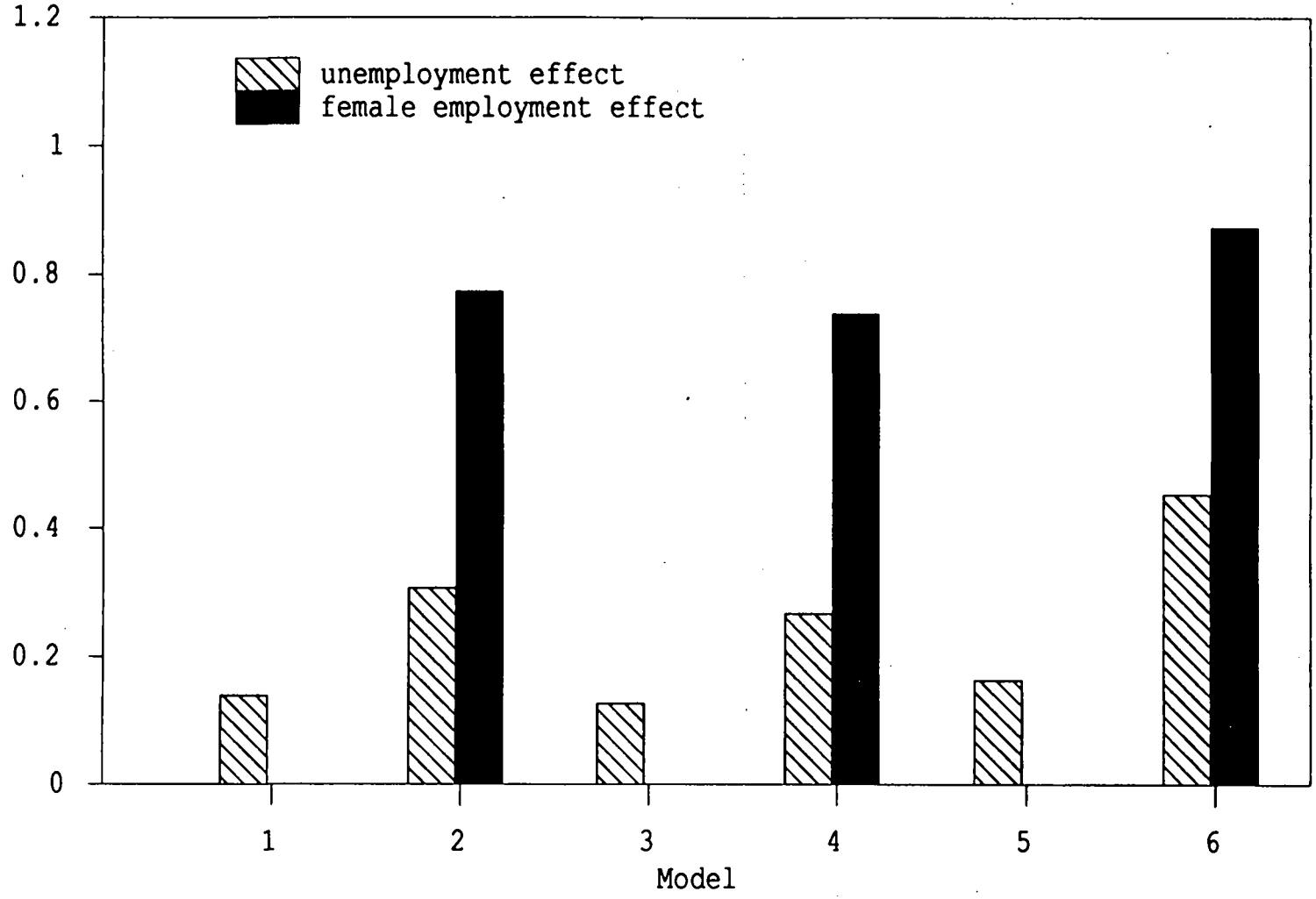


Figure 2: Marginal effects on homicide rate.
(Calculated at mean values)



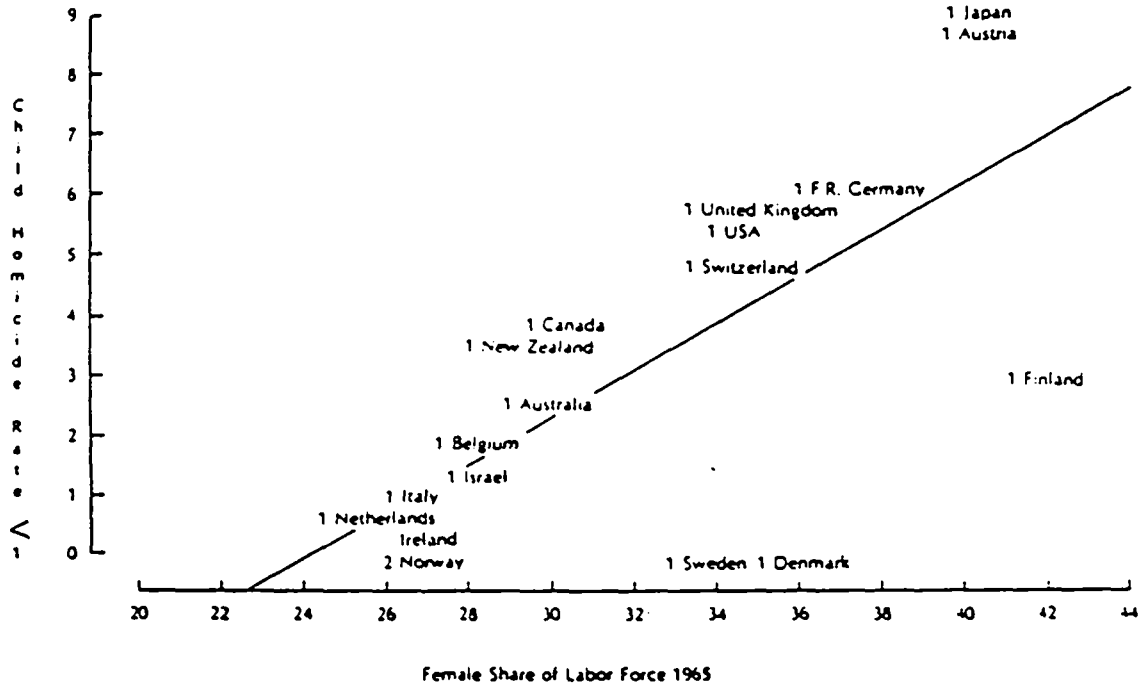


Figure 3. Plot of Female Share of the Labor Force 1965 on Child Homicide Rate for Children Less Than One Year Old.

(Fiala and LaFree, 1988)

Table 1: Estimated models: the dependent variable is homicide rate.

Regressor	*Model*						
	1	*2*	*3*	*4*	*5*	*6*	*7*
Total unemployment	0.046 (1.17)	0.102* (2.25)					
Male unemployment			0.042 (1.16)	0.090* (2.17)			0.016 (0.15)
Female unemployment					0.048 (1.01)	0.134* (2.32)	0.113 (0.79)
Female employment		1.117* (2.29)		1.067* (2.21)		1.261* (2.43)	1.245* (2.33)
Marriage rate	-0.696* (-3.27)	-0.664* (-3.22)	-0.697* (-3.28)	-0.675* (-3.28)	-0.708* (-3.20)	-0.621* (-2.89)	-0.622* (-2.86)
Divorce rate	0.028 (0.41)	0.005 (0.08)	0.024 (0.34)	-0.003 (0.05)	0.031 (0.45)	0.015 (0.23)	0.012 (0.17)
% Urban	0.909 (1.33)	0.913 (1.38)	0.995 (1.36)	1.079 (1.53)	0.672 (1.11)	0.441 (0.75)	0.562 (0.58)
% 18 - 24 males	0.442 (1.58)	-0.435 (-0.93)	0.462 (1.72)	-0.345 (-0.77)	0.464 (1.61)	-0.589 (-1.14)	-0.570 (-1.07)
GDP growth	-0.003 (-0.72)	-0.001 (-0.27)	-0.003 (-0.74)	-0.001 (-0.32)	-0.003 (-0.66)	-0.0002 (-0.04)	-0.0003 (-0.07)
% motor vehicles	-0.055 (-0.54)	0.136 (1.05)	-0.056 (-0.55)	0.125 (0.97)	-0.052 (-0.50)	0.174 (1.29)	0.169 (1.21)
Time	-0.001 (-0.15)	-0.021 (-1.86)	-0.001 (-0.17)	-0.020 (-1.80)	-0.0005 (-0.07)	-0.023 (-0.01)	-0.023 (-1.95)
Constant	-1.857 (-0.82)	-2.742 (-1.23)	-2.237 (-0.92)	-3.465 (-1.43)	-0.967 (-0.47)	-0.894 (-0.45)	-1.370 (-0.38)

Notes:

1) All models are estimated in log-linear form.

2) Numbers in parentheses are *t*-ratios.

3) An asterisk indicates that the variable is significant at 5% level.

Table 2: Diagnostics of the estimated models: the dependent variable is homicide rate.

Diagnostic	*Model*						
	1	*2*	*3*	*4*	*5*	*6*	*7*
$\bar{R}^2$	0.520	0.553	0.520	0.550	0.517	0.555	0.547
Regression Standard Error	0.139	0.134	0.139	0.134	0.139	0.133	0.135
Durbin-Watson test	2.032	2.244	2.038	2.247	2.014	2.216	2.221
Autocorrelation at lag: 1	-0.14	-1.01	-0.17	-1.02	-0.07	-0.89	-0.91
2	2.08	1.24	2.07	1.26	2.18	1.25	1.24
3	-0.41	-0.82	-0.44	-0.87	-0.28	-0.52	-0.56
4	0.76	0.51	0.79	0.59	0.80	.41	0.43
Jarque-Bera test	7.489	6.655	7.354	6.612	7.321	6.244	6.359
RESET (2)	2.161	1.839	2.125	1.647	2.166	1.741	1.772
Salkever's test	1.472	0.940	1.468	0.941	1.460	0.933	0.915
MSL	0.237	0.396	0.238	0.395	0.240	0.399	0.406

Notes:

1) $\bar{R}^2$ denotes the adjusted coefficient of determination.

2) The entries for the autocorrelation are the *t*-ratios of the first four coefficients of the estimated autocorrelation function of the residuals.

3) Jarque-Bera test is a heteroscedasticity in residuals test distributed as χ^2 (1).

4) RESET (2) is Ramsey's (1969) test for misspecification with the second and thi

5) Salkever's (1976) test is a test for post-sample predictive performance with

marginal significance level of the test statistic.