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INCOME MAINTENANCE EXPERIMENTS AND HOUSEHOLD TRANSITION
DYNAMICS
- A TEMPORAL TREATMENT OF INCREMENTAL EFFECTS

by

Saud A. Choudhry
Dept. of Economics, University of Manitoba

A Thesis Submitted to the
Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

Winnipeg, Manitoba
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ABSTRACT

This thesis is on the combined area of public policy and neoclassical microeconomics. It focuses on the dynamics of poverty, welfare incidence and marital instability within a choice-theoretic framework. Specifically, it seeks to investigate how non-wage income transfers like Negative Income Tax (NIT) payments might destabilize marriages by enhancing the economic quality of alternatives to married life.

The thesis makes use of micro data on the employment status, income, asset-debt levels, marital histories, etc., of low-income Canadians who participated in MINCOME - the only Canadian Income Maintenance Experiment conducted (in Manitoba) between 1974 and 1978. MINCOME selected a sample of low income households as a **control group** while simultaneously assigning others - **the treatment group** - to a complex of eight different treatments consisting of various combinations of Guaranteed Annual Income support and Negative Income Tax (NIT) rates. The aim was to investigate whether it is inappropriately designed income assistance programs that contribute incentives leading to decisions to separate; or, if low-income families suffer from unstable marriages for reasons completely independent of the welfare system.

Conventional static analysis of the experimental effects indicated that the MINCOME guarantees had no discernible influence on marital stability. However, on shifting from static to dynamic analysis, it was observed that the experimental plans had a statistically significant effect on family composition changes, specifically, during the middle- and end-period surveys. This suggests that the nature of a support program can influence the stability of experimental households, thereby making a much needed dent in the cycle of family dissolution.

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This thesis owes an immense debt of gratitude to my supervisor, Prof. Derek Hum. It was he who first introduced me to the subject of 'Family Economics', and this thesis could not be completed without his incisive criticisms and cogent amendments. Some of his "pet" ideas can be easily traced in these pages, and other less visible contributions of advice and encouragement also abound.

Prof. Wayne Simpson played an especially crucial role in sharpening the theoretical and econometric rigor of my approach. He patiently read my ramshackle drafts and alerted me to the frequent pitfalls in my arguments. His counsel and criticism have made a highly significant impact on virtually every chapter of this thesis.

Both Wayne and Derek have been teaching me Economics for about five years now, and I hope they can take some small pride in this work of their pupil. I however assure them that the errors which remain are my responsibility alone.

Mr. Don Sabourin - despite the pressure on his time - patiently plowed through the mass of MINCOME data, and prepared for me a file that was comprehensive and manageable. His invaluable assistance is deeply appreciated.

My parents, Alhaj Abdul Quadir Choudhry and Mrs. Nurus Sobah, have always shown faith in me, even during times when I lacked it myself. This thesis is most deeply a tribute to them and to my wife's parents, Professor and Mrs. Nurul Islam, for their unending love and generosity to me.

My wife, Ina, had to endure most of the ideas in this thesis in their raw and unpalatable form, at dinner or breakfast or even the wee hours of the morning. She had to put up with my mood swings as the work progressed satisfactorily or bogged down hopelessly. Despite the pressure on her time, she also helped type and edit several of the final chapters. Her work, as usual, was superb and her support inspiring. I am grateful as ever for more assistance than I can remember, let alone repay.

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Chapter I

INTRODUCTION

"...the marriage of economics and the family is interesting; it may not be happy and it is certainly not peaceful, but it is unlikely to end in divorce." (Yoran Ben-Porath; 1982:62).

With divorce making a shambles of wedding vows, life with only one parent in the house has become a common theme in contemporary Canadian society. Since marriage is now viewed as a less than inviolable commitment, the nuclear family continues to split and divide - life-table analyses suggest that close to 40 percent of recent marriages may eventually end in divorce (Statistics Canada; 1986b:7) - annihilating any hope for stability in the stormy latitudes of the family.

This thesis utilises the assumptions of maximising behavior, imperfect information, transaction costs, equilibrium in implicit and explicit markets etc., to assess how the **Manitoba Income Maintenance Experiment (MINCOME)** - Canada's only experimental test of the guaranteed income concept - affected the marital stability of low income Canadians. This is a question necessitating disciplined analysis because it is one thing if this program of graduated work incentives is actually influencing the dissolution decision, and quite

another if low income families suffer from unstable marriages for reasons completely independent of the welfare system. Available evidence on the dynamics of poverty and dependency suggests that many of the widely-shared assumptions about welfare recipients are ill founded. To cite a few:

1. Aid to families with dependent children make families more welfare dependent and, sometimes, fatherless.
2. Social security payments discourage concern for the aged and dissolve the links between generations.
3. Unemployment compensation promotes unemployment.

Such staggering gaps between public perceptions and welfare realities arise from the belief that anti-poverty programs have reached far beyond their mandate and thus pose a very real danger of **moral hazards**.¹ It is argued that welfare doles, having risen to levels higher than the ostensible returns of an unbroken home and a normal job, moral hazards are inevitable because: (a) single mothers with dependent children are incapable of earning enough to be self-supporting at a level of income that exceeds welfare; and (b) for unemployed fathers, the welfare cheque encourages desertions (and hence dissolutions) as it is a de facto if not a legal alternative to alimony and child support.

¹ In the insurance literature, moral hazard is the danger that a policy will encourage the very behavior - or promote the disasters - that it insures against. This is the limiting point in insurance schemes and it sets the natural boundary of welfare in a capitalist state.

In other words, as the welfare state has assumed (for its citizens) the risks of joblessness, disability, fatherlessness and other real hazards of life in industrial society, it has concurrently bred a **culture of dependency** through its strong negative impact on the recipients' willingness and ability to fend for themselves. As the story goes:

a welfare assisted woman raises a daughter who as soon as she is able to do so, produces a child of her own and thus promptly becomes a welfare recipient. And when this (grand) child eventually becomes a recipient of help as well, the stereotype continues and the **intergenerational welfare family** is born.²

This thesis investigates the alleged³ family dissolution incentives of the welfare system, using, in the main, data on the marital histories of Manitobans who participated in **MINCOME** - the Canadian income maintenance experiment conducted in Manitoba between 1974 and 1979. MINCOME selected a sample of low income households as a **control group**, while simultaneously assigning others - the **treatment group** - to a

² This type of behaviour pattern was first popularised by Oscar Lewis (1959;1961) as the concept of a **cycle of poverty**, a term that was subsequently injected into discussions of public policy by Senator Daniel Moynihan. Moynihan (1965:p.758) was looking at the situation of black families in the United States when he wrote: "the cumulative result of unemployment and low income ... has produced an unmistakable crisis ... and raises the serious question of whether or not this crisis is beginning to create conditions which lead to reinforce the cycle that produced it in the first place".

³ We say alleged because such views are often derived from approaches that are basically atheoretical; the interpretations are speculative and often buttressed by incomplete empirical evidence. Chapter II will show that despite claims to the contrary, welfare programs did not cause increasing numbers of welfare cases to become **welfare cultured**.

complex of eight different treatments consisting of various combinations of annual income support levels and tax rates. In order to test the effects of this wide range of welfare policy options, the sampled families were periodically surveyed over the three-year field phase of the study. The information obtained was archived in a number of data sets and these will be used to answer the basic questions:

1. what is the effect of MINCOME's experimental treatments on the marital stability of low-income Canadians?
2. Can marital dissolution rates be reduced by changes in income maintenance policies and if so, what type of plans and variations within them will serve that objective best?

As these questions exemplify, the intent of this thesis is to investigate whether the Manitoba guaranteed income scheme dissolves or reinforces the the bonds of marriage. However, the centrepiece of the analysis in MINCOME (as in every other NIT experiment) was:

how would labor force participation be influenced by a guaranteed minimum income?

With the experiment's focus confined to labor force issues, design features in other areas - e.g., fertility and family stability issues, expenditure behavior, migration trends - were not accorded adequate attention. Thus the experiment was sometimes unable to yield high quality data on, what Eric Hamsheck (1986) calls, "the residual issues".

Yet we chose to focus on these issues and there are important reasons for doing so.

1. The influence of a NIT program on the size and structure of the family is a matter of importance for policy purposes. Any attempt to estimate the overall cost of such a program will have to contend with possible changes to family structure, primarily because payment per family is a function of family size and type. Thus, if the NIT program leads to more divorces, the consequent increase in the number of **welfare-dependant female-headed households** will swell the size of its actual budget, compared to what it might have been, had the families stayed intact.
2. The feasibility of implementing a full-fledged, national NIT program of indeterminate duration will therefore be considerably diminished if, in fact, the income guarantees cause large numbers of experimental households to break up.
3. Finally, the intergenerational consequences of female household headship is also of policy concern. As the **economic deprivation hypothesis** explains: if 'lone-parent' families are socially and economically underprivileged, then there is a possibility that their children might suffer and become over-represented

among the disadvantaged parents of the next generation.

All these considerations imply that evaluating the feasibility of a national NIT program is not a simple question of comparing its costs vis-a-vis the present welfare system. Additionally, one must also take into account the social and economic cost of changes in the rates of marital formation and dissolution that the NIT plans themselves induce.

1.1 SOCIO-ECONOMIC COST CONSIDERATIONS

In the first place, if an NIT were to contribute to a higher dissolution rate among its beneficiaries, it would accelerate the already distressing trend towards "single parenthood" in Canada.⁴ Such a prospect is alarming, particularly because female-headed households are already at the base of much of Canada's income poverty today. David P. Ross' (1981) profile of low-income Canadian families sug-

⁴ The 1976 census, for instance, (Statistics Canada, Vol.2, Part V) found that between 1971 and 1976, the number of divorces had increased by 72.8%. Dumas (1983:70) arrived at a "total index of divorce of 3,655 per 10,000 or 36 percent and speculated that a "total divorce rate of approximately 4,100 per 10,000 for 1985 is not an unreasonable forecast". The 1984 Family History Survey (Statistics Canada; 1986b: p.7) also confirmed this general upward trend : "life-table analysis of Canadian divorce data for recent years suggest that close to 40 percent of recent marriages may eventually end in divorce".

gests that they represent only 6.8 percent of non-low income families, but one third of all low-income households. This sad situation is also borne out by his data gathered under "family characteristics". The category **all other families** (which almost entirely represents single-parent families), makes up only 9.4 percent of non-low income families but more than one third of low income families.

The struggle of poverty-stricken, single-parent households go beyond their isolation. The financial strains of raising a family alone are actually creating a **new class of poor**, particularly among women who head nearly 90 percent of the nation's one-parent households. With poor educational backgrounds and little or no skill training, and because of extraordinary family responsibilities that severely restrict the nature and hours of employment - single mothers qualify primarily for intermittent and low-paying jobs. The findings from an ERS (Economic Research Service) study may be cited here (Meyers, 1970). About 1,249 heads of households in the Mississippi Delta Region were asked about their willingness to take special training, to change jobs and to move to a distant city. The respondents who showed the greatest reluctance in each category were **black, female family-heads**. True, most of these single-parents were poor, but it was clear that their family responsibilities hampered them more than their poverty did.⁵

⁵ This is also the primary reason behind what is sometimes called the **feminisation of poverty** - a phenomenon which in turn poses interesting macroeconomic questions:

A final point centres around the fact that income-tested transfer programs cause transfer payments to increase as more and more intact families dissolve into single-parent entities. In such a situation, there is always the possibility that the enhanced volume of transfers will be financed by increasing the taxes of nonbeneficiaries (i.e., the intact households). It is these economic costs to society as a whole and to nonbeneficiary taxpayers in particular, that form the **economic basis** for concern about the marital stability issue.

While investigating MINCOME's experimental influences (pernicious or otherwise) in these areas of concern, we will in the main apply, extend and (sometimes) modify Gary Becker's theory of the family. Becker's household (or home) eco-

-
1. How will social security payments and other public expenditures to support poverty stricken, single-parent households affect the budget deficit and/or the levels of private savings?
 2. It is often argued that deficits incurred in the course of financing these transfer payments will be translated into a higher tax burden for future generations. But if **altruistic** parents increase their bequests in a bid to offset the effects of such taxes on their children, will such an action prove or disprove the "Ricardian equivalence theorem"? How might it alter the traditional conclusions about the effects of budget deficits on private savings?

Future researchers in the field might want to explore these issues.

nomics is really an integrated version of ideas, both old and new.⁶ It adheres strictly to the precepts of neoclassical microeconomics in explaining how the seemingly many diverse facets of family life interact with the economy and the society in complex and interesting ways.

There is a compelling need for this kind of systematic economic enquiry into the nature and stability of family life. The evidence suggests that early researchers borrowed piecemeal from the general theories of the relevant disciplines - sociology, psychology, social psychology - often to the almost total exclusion of economic variables. The sociological literature, for instance, has until recently focussed mostly on the quality of interpersonal relations in the union and on the fit among the spousal attributes - e.g., statuses, personality factors and cultural backgrounds.

Attitudes are however changing today and academics from an array of theoretical perspectives are recognising the need for diffusing disciplinary lines and bodies of knowl-

⁶ Ever since the emergence of post-Marshallian micro analysis, economists have often been accused of viewing their subject matter very narrowly - involving only the production and distribution of valued material goods. Family economics and the demographic phenomena associated with it - topics which the classical economists regarded as their natural domain - suffered relative neglect. Gary Becker (through his work on the household production model, human capital theory, the allocation of time), has brought microanalysis back into areas which economists had either abandoned or never entered before. Thanks to Becker, **family economics** is once again a respectable and growing field.

edge in order to identify the diverse and common universes of discourse among disciplines. As economists, what inspires us in such an enterprise is our conviction that there are elements of **choice** in familial behavior; that a variety of our neoclassical instruments may be relevant here, particularly when one wishes to "cut through the romantic mist that so often blinds social scientists to the hard economic realities/choices faced by families and their members" (Hannan; 1982:67).

1.2 ORGANISATION OF THE THESIS

Chapter II will review the theoretical arguments (sometimes sociological but primarily economic), as well as earlier empirical work on the relationship between economic variables and family stability. Specifically, it will concentrate on the relationship between the receipt of transfer payments and changes in the composition of households, by comparing the stability analysis conducted in earlier NIT experiments (e.g., the New Jersey Experiment, the Rural Income Maintenance Experiment, the Gary Experiment and SIME/DIME).

Chapter III will sketch the economic-theoretical framework for analysing issues in marital stability, thereby car-

rying economic analysis into largely uncharted seas. Gary Becker is the uncontested intellectual leader in this field. But as a pure economic theorist, Becker bases his analysis on the maximisation of stable utility functions, specified in the most general terms and assumes equilibrium. In the real world, however, information flow is neither costless nor perfect - a fact of life that makes Becker's model a 'powerful' rather than an all-embracing 'almighty' tool. In our theoretical discourse, we will remain reasonably faithful to the "Becker marriage and marital disruption model" and at the same time incorporate additional elements such as the economics of information, search theory, decision making under uncertainty, to ask additional questions and to formulate further falsifiable hypotheses.

Chapter IV will discuss the historical origins of the Manitoba experiment, provide a brief introduction to what social experimentation is all about and outline the rationale for conducting such experiments. Also included is a description of two statistical models - the **path analytic model** and the **hazard model** - employed for estimating experimental effects.

Chapter V will illustrate how the path analytic technique can be used in the analysis of MINCOME's experimental data. Path analysis requires that the assumed causal sequence of effects be unidirectional, and that they must also be determined apriori. It also rules out the possibility of 'recip-

rocal causation' between the variables of interest. In MINCOME's experimental setting, the 'independent' variable is induced temporally prior to the measurement of the 'dependent' variable, and as such the possibility of reciprocal causation can be ruled out. This, together with the fact that the causal directionality can also be interpreted unambiguously, makes the path model ideally suited to the analysis of MINCOME's experimental data.

Chapter VI will provide an alternative approach - the **proportional hazards analysis** - to measuring the effects of the various NIT plans under conditions of controlled experimentation. This is a technique closely related to procedures in biostatistics, one that allows researchers to investigate variations in the number, timing and sequencing of major life-course transitions (e.g., death and divorce), within a multivariate framework.

While path analysis is a useful causal inference procedure for analysing issues in marital stability, it is actually a method designed for the study of structure rather than process - an inappropriate methodological tool given the dynamic, processual nature of separation and divorce. Hazard analysis, on the other hand, is specifically designed for modelling social processes. It takes account of the dynamics of familial transitions and as such can demonstrate the simultaneity of number, timing and sequencing of demographic events within a temporal framework.

Finally, **Chapter VII** summarizes our findings and discuss some of their implications. We find the overall picture to be devoid of any highly dramatic features. Established behavior patterns and attitudes were not radically altered and the higher incomes (experimentally generated) were often absorbed in ways consistent with conventional economic theory and previous empirical findings.

Chapter II

THE FAMILY DISSOLUTION INCENTIVES OF THE WELFARE SYSTEM: A REVIEW OF RECENT RESEARCH

This chapter is a review of selected research and theoretical writings published since the 1970s exploring the complex economic relationship between family stability and welfare incidence; specifically, the question of whether inappropriately designed income assistance programs may have contributed to decisions to separate. The mass of empirical research may be classified into two broad categories:

(A) **the non-experimental literature** - first, in the general area of the relationship between economic well being and marital stability; and secondly, those examining the family dissolution incentives of the current welfare system;

(B) **the experimental literature** - emerging from the four Income Maintenance Experiments conducted in the United States - assessing the impact of an alternative form of welfare (NIT), on the family's decision to split and disintegrate.

We shall consider these two categories of research literature in turn.

2.1 THE NON-EXPERIMENTAL LITERATURE

A review and synthesis of this voluminous literature reveals two major strands of research:

1. On the one hand, the literature treats marital split as an economically motivated phenomena - the outcome of stress generated by poverty and male-head unemployment. Critical here is the evaluation of the husband's role performance as a breadwinner. A spell of male-head unemployment will inevitably produce incompatibility between role expectations and actual performance. The consequent downward revision in an individual's expected financial contribution to a marriage may so jeopardise the fragile interpersonal components of the union that a split is considered the optimal outcome.
2. A supplementary strand of the literature examines the conventional economic wisdom that family stability depends on various incentives and disincentives including those emanating from welfare payments. The rich empirical analysis testing this theory inspired by Frazier (1939) often suggests a complete interaction between family formation and welfare payments, sometimes even positing that the growth in welfare during the sixties and the seventies is the proximate cause of the disproportionate growth in female-headed households.

2.1.1 Family Income, Employment Status And Marital Instability

This line of research dates back at least twenty five years and the relevant literature spans several disciplines including economics, sociology, psychology, political science and law. As such it goes without saying that unanimity of opinion is not among its principal virtues.

Cutright (1971) contributed most significantly to the promotion of the view that income levels are inversely related to observed variations in dissolution rates. He hypothesised a causal chain from education to occupation to income to marital stability. The 1960 U.S. census data appeared to be consistent with his model, leading him to comment that the impact of income on marital stability may be greater than previously assumed.

But the impressive volume of research that followed produced mixed results, even providing evidence to suspect that Cutright's hypothesised unidirectional causal relationship between income and marital dissolution could be seriously flawed. To cite a few:

1. Carter and Glick's (1976) analysis found that men with lower incomes were more likely to be divorced, whereas Coombs and Zumeta's (1970) study argued that it is the attitude of wives towards their income situation that is relevant.

2. Wolf and MacDonald's (1978) work with data on men first sampled as Wisconsin high school seniors in 1957 found that while doing better than one's peers does not significantly reduce the chances of a split, doing worse invariably does, and it does so significantly.
3. Mott and Moore (1977), using data from the National Longitudinal Survey of Labor Market Experience (NLS), reported little or no association between husband's earnings and marital stability. But while the effects of income were small, they observed mean earnings to be higher among stable couples. Also marital dissolutions were found to be somewhat less likely among those without debt. This seems plausible because some families with high incomes may be hopelessly in debt and this will without doubt increase marital strain and the probability of divorce.
4. Likewise, Ross and Sawhill's (1975) work with data from the Michigan Panel Study of Income Dynamics (PSID) revealed that marital splits were related to lack of assets, income decreases and unemployment, but not to the level of income. With asset levels as a critical factor - a crucial intervening variable between income and marital instability - family income levels are thought to have only an indirect and relatively small effect on marital instability.

5. Using the same data base (PSID), Hoffman and Holmes (1976) found that when other variables are controlled, marital dissolution is negatively associated with the husband's hourly wage rate and the average hours worked each week. But after controlling for variables such as homeownership, savings, hours worked and unemployment, the wage rate no longer had a consistent effect.
6. Galligan and Bahr (1978:287) analysing data collected as part of the National Longitudinal Survey of Market Experience, found that the proportion of unstable marriages declined by almost one-half as the male-head's earnings rose from below \$4000 to above \$7000. More precisely, marital splits occurred 18 percent of the time for family incomes below \$4000 compared to an occurrence rate of 11 percent for family incomes of \$7000 and above. On the other hand, asset levels appeared to have the greatest effect as only 8 percent of those with assets worth \$1000 or more, dissolved their unions, compared to 18 percent of those with total assets of zero or less. One explanation for these statistics might run as follows: for an individual, the optimal marital decision at any time would be the one that maximises the expected value of full wealth over the remainder of his or her life. Hence, if all compensations between spouses were feasible and costless, an individual would separate if

only his/her post-dissolution wealth were expected to be greater than his/her wealth in the union. But in reality, a dissolution is not costless as it entails sizeable emotional and financial costs. Also, complications shroud post-dissolution property transfers, specially when it involves tangible assets like family homes, monetary savings, cars etc. All these introduce an element of uncertainty in the division of wealth between former spouses, which in turn imparts biases to the status quo in decision making. In other words, a mother with dependent children looks long and hard at the uncertainty surrounding expected seperated wealth. If she then hesitates in seeking a seperation, this risk-averse individual is only opting for greater certainty by choosing to stay with her man even though he is "more frog than prince".

7. Becker et al. (1977:1160) found earnings to be consistently negatively related to marital stability up to an earnings level of \$40,000 and positively related at higher income levels. They also noted that a permanant increase in earnings lowers the probability of a dissolution, while a large deviation between actual and expected earnings increases its chances. As such, dissolutions would be specially high among families at the lower tail of the distribution of actual earnings, not only because the deviations are large but also because expected earnings are low.

It appears therefore that on the question of whether low incomes cause splits, or if splits are the result of reasons other than income, the evidence is mixed. One possible reason may be that the studies are drawn from a mixed bag - some based on cross-section data and others on longitudinal data.

While income appears to be a critical factor in interpreting the mass of divorce and separation figures, a majority of the cross section studies are invariably handicapped by a serious limitation. One cannot be certain whether low incomes produce dissolutions or dissolutions produce low incomes, since in these studies income was assessed at the same time that marital stability was assessed. For an unbiased assessment of the effect of income on marital dissolution, it is imperative that income be measured prior to the dissolution. As a specific illustration one could cite an implication of Becker's theory (partly supported by the 1967 Survey Of Economic Opportunity data), that unexpected gains or losses in income will have destabilising effects on marital stability. However the direction of causality is unclear as income was measured after the split had occurred. This creates a new set of problems because a disrupted union can (and often does) hamper occupational achievement. As such an individual who is divorced and has been so for sometime, may be earning and reporting an income far less than what it was during the marriage - thereby confounding the true effect of

income levels on marital splits. If all this is true, then the cross-sectional relationship between income and marital splits includes not only the effect of income on the dissolution rates, but the effect of splits on income as well. Cutright (1971:305) recognised this deficiency in his approach and agreed that the 'factors require further testing with longitudinal data before the relative contribution of each to marital stability can be adequately measured'.

A final deficiency is due to the inherent cross-sectional character of these studies; often focusing on comparing families with varying levels of income, instead of studying the impact of changes in income on the dissolution rate.

While the longitudinal studies were by design free from most of the above shortcomings, they have problems of a different nature - a small proportion of unstable marriages. Hampton (1975:166), Ross and Sawhill (1975:56) and Mott and Moore (1977:1) reported that the percentage with unstable marriages was 10, 8 and 14 respectively. In such situations, normal techniques such as multiple regression analysis would be inappropriate, since the dependent variable is dichotomous and highly skewed. But in all of the above mentioned studies multiple regression techniques were used. Galligan and Bahr (1978:287) have shown that under similar circumstances, log-linear analysis techniques such as that developed by Goodman (1972,1973) would provide a more definitive

test of the impact of economic variables on marital stability.

Hampton's work with longitudinal data (PSID) also erred from another methodological viewpoint. Among his 15 explanatory variables, income was the best predictor of marital instability, although the magnitude of the relationship was small. But a major limitation of his approach was that his measure of income was an average of family income over the entire study period. Thus, income levels after marital dissolution were averaged in with predissolution incomes and used to predict dissolutions. The value of the longitudinal data was thereby lost, and with it any possibility of a fruitful assessment of the effects of income on marital dissolution.

Another shortcoming is that a number of these studies focus on aggregate family income, ignoring its constituent components; particularly, male-head earnings, female-head earnings and non-wage income.⁷ These distinctions are of primary importance since an increase in male-head earnings invariably increases the wife's dependence on her husband. The end result is a weakening of the independence effect and a strengthening of the income effect - thereby solidifying the union. If on the other hand, family income increases

⁷ Non-wage transfers (e.g., welfare doles) and/or a working wife's earnings tend to stabilise a marriage by improving the family's income situation - the income effect but they also diminish the wife's dependence on her husband, thereby generating influences that are destabilising for the union - the independence effect.

because of an increase in the wife's earnings and/or an increase in transferable nonwage incomes, both the income and independence effects are strengthened and the final outcome is a function of the relative strength of these two opposing effects. Rank (1987:18) notes that wife's employment can increase the odds of a dissolution by as much as 89%, thus implying that as wives gain economic independence over their husbands the likelihood of a split increases.

2.1.2 Work Effort And Marital Instability

While the influence of income, assets, and similar measures on marital stability is vague and mixed, the evidence on the effect of unemployment on marital splits is, by contrast, quite uniform. Hoffman and Holmes' research show that husbands experiencing high unemployment or high job turnover were more likely than others to experience a dissolution. Not surprisingly, Cohen's (1979) work with the same data set (PSID) drew similar conclusions. Cherlin's (1976) study of the marital splits of 30-44 year old women in the National Longitudinal Survey (NLS) found unions to be more stable when the husband worked all year. Likewise, Caldwell's analysis (in Moore et al. 1977:80) of the NLS sample of comparatively younger women, found that residents of areas with

high unemployment rates faced (statistically significant) higher marital split rates.

Thus evidence appears quite strong for the proposition that families whose heads experience extended periods of unemployment are more likely than others to split. All three published studies of aggregate data found higher rates of female-headed single parent households associated with high unemployment and/or low wage rate for male heads. Honig's (1974) study of 44 metropolitan areas, for instance, found that after controlling for the characteristics of the AFDC program, rates of female headship of both white and black families (in 1960 and 1970) were lower whenever the male head worked and earned more. A similar strong impact of unemployment rates on rates of female headship were also observed in the Ross and Sawhill (1975) study.

Looking at the mix of constraints and opportunities arising out of male-head unemployment, Gary Becker offers an explanation for the positive relationship between female-headship and male-head unemployment. He emphasizes the effect of incompatibility between the male-head's role expectations and actual performance. "A spell of unemployment often indicates longer run difficulties in the labor market that were not anticipated at the time of the marriage" (Becker et al. 1977:1161). The consequent downward revision in the husband's expected financial contribution to the union may so reduce the gains from it, that a dissolu-

tion emerges as the optimal alternative. In other words, persons separating presumably had less favorable outcomes from their marriage than they expected when marrying.

For Becker, as well as for a majority of the studies reviewed, any visible change in a family's economic situation will inevitably change the character of the union; e.g., higher relative earnings for males will result in greater numbers of two-parent families. Likewise, a decline in independent sources of income for the female-heads of households will contribute to the strengthening of the union (through a weakening of the destabilising 'independence effect').

Interestingly, while these studies systematically explore the relationship between marital dissolution, employment status and family income, they do not explicitly show how the association between income and marital stability is confounded by the effects of marital dissolution on income, work habits and general economic well-being. And as mentioned previously, there can be no denying the fact that dissolution of marriages does hamper occupational achievement, and hence, the economic well-being of males. That being the case, we ought not only to consider the effect of income or employment status on the divorce rate, but also what effect divorce has on these same factors.⁸

⁸ This being a simultaneity problem, the researchers might have employed empirical testing procedures such as those based on the Granger-Sims method and Hsiao's stepwise procedure, to show the degree to which the causal process

2.1.3 The Family Dissolution Incentives Of The Welfare System

The heart and soul of an increasingly pervasive economic argument lies in the claim that the current welfare system provides destabilising incentives for the family. It is argued that male-heads who fail to provide acceptable levels of consumption for their dependents are viewed as failures by themselves and by others. This signal of failure explanation holds that one response to such failure is flight from the marriage - a sorrowful solution to feelings of inadequacy in their marital/familial roles. This adverse situation is further aggravated when the female-head secures access to incomes comparable to, or in excess of what the male spouse could earn for the family. As MacDonald and Sawhill (1978:103) argue in the American context: the AFDC system of welfare "relieves economic pressure to remain married, or to (re)marry, since it provides a source of income for women outside the marriage". Hence the significance of introducing the welfare system as a possible incentive for the formation of female-headed households.

Welfare conditioned on the household's income is the poor woman's alimony and like a higher wage rate for women, reduces the gains from marriage. Hum (1986:95) shows how welfare's financial incentives can sometimes encourage families to split into smaller units so as to receive larger benefits:

might be of the feedback type.

Consider for example, an initially intact family composed of a non-working single parent and two children, one a youth. This family would receive UISP benefits amounting to \$8415 if we treat one of the children as an adult-equivalent and the household head as a single parent. Reconstituted as two units, however, one comprising the parent and young child, and the other a young single person, the sums payable to both units would be \$7650 and \$1913 respectively, almost \$1200 greater even after reducing the amount guaranteed to the youth to only one half that for an adult. If the young adult received any earnings at all, incentive to split the family would be yet greater still.

Similarly, it can be shown that a two-parent family, with the father working at minimum wages, will benefit financially if the father leaves. However, no one has yet proved conclusively that such financial inducements have important effects on marital dissolution rates. Most research correlate state welfare benefit levels with the number of female-headed households, while controlling for other factors such as the level of unemployment or female wages (Honig 1974, 1976; Minarik and Goldfarb, 1976; Ross 1975). But as will be explained shortly, the use of data aggregated at the state level denies these studies the ability to disentangle the effect of the benefit levels on the number of female-headed households from the effect of the number of female-headed households on the benefit levels.

While welfare dependency continues to be looked upon by many as an evil in itself - undermining a family's unity, destroying the work ethic etc., - the empirical evidence for such a proposition is by no means secure. Honig (1974:316)

found that for both black and white Americans, a 10 percent increase in the AFDC payment, *ceteris paribus*, would result in a 3 to 4 percent increase in the proportion of families headed by females. This kind of impact of AFDC on welfare-induced family dissolutions led Honig to conclude that increases in the level of support to AFDC families, without concurrent increases in their earnings, will lead to increases in the proportion of families headed by females as well as increases in the proportion of the population receiving public assistance income. But studies that use states rather than metropolitan areas as observations - Minarik and Goldfarb (1976), MacDonald et al. (1977) - have found nonsignificant negative effects of higher AFDC payments on the incidence of female-headship. In fact the elasticity of female-headship with respect to AFDC payment was $-.11$ in the Minarik and Goldfarb study.

These results were supported by others working with census data. To cite a few:

1. Cutright and Madras (1976), using census data and models similar to those used by Honig, conclude that differential AFDC levels had not contributed to marital instability.
2. Bane (1975) using individual data from the 1970 census, found no evidence that the average level of AFDC payments was related to the fraction of men or women who had ever been divorced.

3. Mark Rank's (1987:19) work with welfare households concluded that variations in welfare payments do not significantly increase or decrease the risk of a change in family composition. He found no evidence to believe that changes in welfare benefits, number of public assistance programs received, or length of time on welfare have any statistically significant effect on the likelihood of divorce among welfare recipients.

While these census based studies are useful, they do not conclusively prove the effect of welfare programs on family formation. Their principal shortcoming - essentially the same as that cited when analysing the effects of income on marital instability - is that the dissolution is measured only at the time of the census and not accounted for at the instant of its occurrence. It thus becomes impossible to isolate the effects of welfare payments on marital dissolution from the effects of marital dissolution on the numbers of welfare beneficiaries. One cannot rule out the possibility that the causality could be running in a reverse direction - i.e., from female headship to welfare dependency. After all, it goes without saying that the economic disadvantages of being a female head with dependent children does create a desperate need for welfare assistance.

Studies based on longitudinal data, on the other hand, follow representative samples of two-parent families over

time and as such are better suited to estimate the effects of welfare benefits on marital dissolutions. Hoffman and Holmes (1976), using six years of PSID data (1968-1974), found that while states with high AFDC payment levels had no tendency to have higher overall split rates, the low income families in these states did have substantially higher split rates. They therefore concluded that higher AFDC payments do indeed enhance the split rates of families at the lower end of the income scale. This interaction which they uncovered between family income and marital instability suggests that studies using aggregate data may have obtained weak results because the data included large numbers of high income families. However, Sawhill et al. (1975) analysing the same data, failed to find significant coefficients for the variables measuring the generosity of AFDC benefits. The small positive coefficient in the Sawhill study suggests that the Hoffman-Holmes estimates of AFDC effects may be biased by such problems as the absence of controls for regions or the assignment of AFDC payment variables to couples without children.

Cherlin (1976, 1978 and 1979) used several of the NLS samples and found that in a four-year period (1971-76), AFDC benefit levels had no effect on the marital stability of white, non-farm women in the 30-44 year old cohort. However, while studying black women in the same age cohort, he did find a significant effect (at the 10 percent level). But

Cherlin urges caution in interpreting this result because his study was unable to isolate AFDC benefit level effect from the effect of residence in the South.

In the United States, the widespread incidence of black female-headed households subsisting on welfare reflects a deepening problem of sheer survival for black people in America. It is in no way evidence that welfare 'causes' blacks to choose family structures with women heads because of the strong inducements presented in the form of AFDC benefit payments. Nor is it a proof of the **culture of poverty** thesis, that the comparatively higher rates of splits among the poor reflects cultural differences between them and the rest of the society; i.e., the hypothesis that the poor in general, and black people in particular, are caught in a "tangle of pathology" (Moynihan, 1965:30), and their dissolution rates are high not because they lack material resources, but because they lack the necessary values and personality traits.

While more than 40 percent of black families are headed by females (Darity et al. 1984:765), their overwhelming majority is also exceedingly poor. If there is any empirical relationship among these factors at all, it is most likely to be the impact that female-headship has had on welfare dependency and welfare benefit levels, not the reverse. Richard Coe subscribes to this kind of a possible direction in causality on the following grounds:

Black women ... have low expected wages in the labor market, as a result of a combination of low human capital and double discrimination (being black and female). With child care responsibilities piled on top of bleak labor market prospects, welfare may be the only source of livelihood for this group. (Coe, 1982:48).

True, some economists continue to consider it logical that a more generous welfare program will increase the number of disrupted marriages. But gaps in their theoretical underpinnings and inconsistencies in the empirical findings, suggest that much more work will have to be done before such a proposition can be conclusively proved.

2.1.4 Self-selectivity Bias And Non-experimental Studies

While the non-experimental studies cited above bear testimony to the marked growth in sophistication and complexity in the literature evaluating the existing welfare programs, they retain (among other deficiencies) an important source of **self-selection bias**. To illustrate: families currently on welfare are units that have already made decisions which contributed to their eligibility for the welfare dole. As such, these families may be very different as a group from families not on welfare. Because of this **self-selection** there is no appropriate control group, and the measured differences between families on welfare and those not on it, cannot be attributed entirely to welfare benefits. In **Income**

Maintenance Experiments, on the other hand, all experimental treatment families with low incomes receive payments. Hence, measured differences in behavior between treatment and control families can be attributed to the experiment. That is, the use of an experimental design with assigned treatments eliminate self-selection bias, and one can be quite sure that experimental treatments are the true cause of observed changes in behavior.

Hence the importance of the experimental literature for evaluating program parameters.

2.2 THE EXPERIMENTAL LITERATURE

Figures on marital splits are now available for all four U.S. experimental studies on income and dissolution. The results obtained are particularly instructive, as they offer broad lessons of significance in the enduring debate over welfare reform alternatives. One theme that pervades all four experiments is that program design is essentially a process of making trade-offs among competing objectives. For instance, participants with higher benefit levels were found to work less, yet they experienced fewer marital splits than those receiving less generous payments. Labor supply and marital stability impacts thus run counter to the concerns over program costs and adequacy. A major contribution of the experiments is that they demonstrate empirically just where

such trade-offs might occur - at what benefit levels and among which beneficiaries. The research should therefore facilitate the process of setting priorities by spelling out the choices to be made, when undertaking the difficult task of translating the experimental outcomes into implications for policy.

2.2.1 The New Jersey Experiment

The New Jersey Experiment was the first large scale social experiment. Sawhill et al. (1975) studying marital dissolution trends among 968 families in the New Jersey Experiment, found that 12 percent (116) suffered a split. Their study used both OLS regression as well as Logit analysis. The coefficient of the NIT dummy variable was consistently positive and significant, implying that an NIT treatment increased the probability of a split. The 100 percent and 125 percent of poverty level guarantees were represented by a single high guarantee level. All of the resulting three guarantee level coefficients were significant, with the lowest guarantee level (50 percent of poverty level) showing the greatest impact.

Following the work of Hannan, Beaver and Tuma (1974), Sawhill et al., (1975) also attempted modelling the independence effects of the NIT treatments. Even after including the wife's independent income (wife's earnings), as well as

the payment to the family in the equation, the NIT treatments variable was significant and positive. Sawhill et al. thus suspected that it was some feature of the experiment other than the guarantee levels that could be responsible for the higher dissolution rate - possibly the effect of attrition bias.

Wolf (1976) analysed marital dissolution in the same experiment with a sample that included only intact families who had completed the 11-th quarterly interview. Families that had suffered a split prior to the 11-th quarter were included only if at least one spouse was interviewed. His final sample contained only 588 couples with 40 reported dissolutions. Representing the experimental treatment with an NIT dummy variable and with guarantee and tax rate variables (assuming that control families have zero guarantee levels and tax rates), he found no significant effect of the NIT treatments on marital dissolutions.

Wolf's results are different from Sawhill's; these may be due to differences in methods. For instance, Wolf used responses to questions asked only during the 11-th quarterly interview (Sawhill et al. used responses obtained at each quarterly interview); dissolutions followed by attrition before the 11-th quarter were excluded; and also excluded were cases that had missing data on the independent variables included in his equations.

2.2.2 The Gary Experiment

Henry (1975) reported that the Gary experiment had no significant effect on rates of marital dissolution. He found that the NIT treatment effects were negative but not significant except for the most generous treatment (high guarantee coupled with a low tax rate), which showed a slightly positive, but insignificant effect.

Wolf (1979) analysing marital dissolution in the same experiment, made use of both probit and transition rate models. His analysis controlled for the ages of both spouses, the literacy level, work effort, family size and pre-experimental incomes. A single dummy variable or a pair of dummies for high or low guarantees, represented the NIT treatments. Neither method yielded significant treatment coefficients; in fact, all treatment coefficients were negative.

The administration of Gary may have been in some way responsible for the small experimental effects. In Gary, the husband was the filer and the cheque was always made out to him. Since neither the enrollment interview nor the program rules provided to the families explained what would happen in the event of a split, some of the Gary families may have erroneously assumed that they would lose eligibility if a split occurred. This could have created among the less-informed participants, a dependence effect that outweighed the (destabilising) independence effect created among well-in-

formed families. Perhaps the difference between the experimental impacts in Gary and other locations is an indication of how important seemingly small changes in program administration can be.

2.2.3 The Rural Experiment

The rural sample was made up of 600 double-headed households from North Carolina and Iowa. Over a three year period the experimental and control families exhibited annual dissolution rates of 0.0175 and 0.0181 respectively. Evidently the occurrences were far too few for drawing dependable inferences.

It appears therefore that none of the three early experiments found any significant experimental effect. The lone exception was the Sawhill et al. analysis of the New Jersey experiment. Following are some of the factors that may have biased the experimental findings:

1. While large samples are a necessity for discerning the impact on marital stability of extending cash assistance to double-headed households, all three of the above experiments were hampered by relatively small samples.

2. All three experiments lasted only three years. A longer term experiment might provide better predictors of the effect of a permanent program.
3. There were major changes in the rules regarding marital status and program eligibility during both the New Jersey and Gary experiments. In New Jersey, the rules were altered to allow households with unemployed male-heads to receive AFDC, and AFDC support levels also underwent substantial changes. In the Gary experiment, treatment households were informed that single-person households formed as a result of marital splits, would not be eligible for the NIT benefits. These changes were enacted at the end of the first year of the experiment, and as such they may have contributed towards limiting the usefulness of the experimental results.
4. A final drawback is the methodology (i.e., the static models) used. In the social sciences the most common approach in data analysis of this sort is some kind of linear regression analysis. Sawhill et al. used logit analysis to study the effects of the New Jersey experiment and Wolf followed their lead in reanalysing the data from the Gary experiment. These efforts were certainly an improvement over earlier procedures, as they allowed the analyst to parametrize the

effects of design variables and covariates. But they do not deal with the problems of right-censoring, differential variation in the length of exposure to risk of the event (here marital disruption), or the occurrence of multiple events to the same individual.

2.2.4 The Seattle-Denver (SIME/DIME) Experiment

SIME/DIME was a social research enterprise of massive dimensions. The experimental sample contained more families than all the other three experiments combined; while the others lasted three years, three quarters of the SIME/DIME families were enrolled for three years and the rest for five years or twenty years. While its predecessors were handicapped by attrition bias, the methodology used in SIME/DIME permitted analysis of even families that had attrited.

It is these areas of strength that gave SIME/DIME the best opportunity to date, to evaluate the effects of NIT alternatives on marital stability.

Groeneveld, Tuma and Hannan (1980) analysed data over several time periods and their methodology reflects the rigor with which the problem was approached. They chose to model marital dissolution as a discrete-state process in continuous time, and analysed the experimental treatment effects on instantaneous rates of transition from one state

to another. The results obtained were like no other. They consistently found that the experimental NIT plans increased the marital dissolution rates for both black and white families. The plan with the highest guarantee (140 percent of the poverty line) had the smallest impact on dissolutions and it was not statistically significant for any racial-ethnic group - black, white or hispanic. More specifically, the pattern of experimental effects was as below:

TABLE 1
PERCENTAGE CHANGE IN INSTABILITY RATES

Guarantee Level	Black	White	Chicano
90% of poverty line	69%**	96%***	60%
125% of poverty line	93%***	55%*	-28%
140% of poverty line	21%	12%	-35%

*p<.01; **p<.05 and ***p<.01
Source: Groeneveld, Tuma & Hannan (1980:169).

As evident above, the lowest level guarantee had a larger impact than the highest level guarantee. The fact that split rates were lower for the most generous plans, that families above the break-even level experienced a rise in split rates, and that non-experimental studies consistently found that general increases in wealth lower rates of female-headship, has led to the conclusion that a pure income effect will stabilize marriages. The high dissolution rate of the lowest level guarantee is particularly interesting because,

in financial terms it is little different from the conventional AFDC and Food Stamps program. Perhaps it is indicative of the fact that the experimental effect is in large part due to non-pecuniary differences between the experimental programs and the existing welfare system - e.g. wives may feel that going on AFDC is more stigmatising. If this hypothesis is correct, then the experiments may not be changing the basic quality of marital relationships. The **tipping of the worst marriages** interpretation, as it is called, implies that the experiment merely provided the wife with the option of severing an already sour relationship.

For a long time, the startling Groeneveld-Hannan-Tuma conclusion that rates of marital dissolution were more than 50 percent higher among the SIME/DIME experimental couples (as compared to controls), went virtually unchallenged or criticised. But on re-analysing the same data set, Cain and Wissoker (1988) reached the conclusion that the evidence about NIT's strongly destabilising effects, is not decisive. In fact Cain and Wissoker found that the NIT plans proved to be **stabilising** for blacks in Seattle but strongly **destabilising** for them in Denver; Chicanos, on the other hand, were **stabilised** in Denver. The results for the white sample were similarly perplexing.

The Cain and Wissoker results were different because of several modifications they introduced into the analysis:

1. they included the full five years of the five-year experiment, whereas Groeveneld et al., considered the data from the first three years only.
2. They eliminated childless couples on the assumption that such families would be by-passed by a national NIT program, if ever one were implemented.
3. In an attempt at uncovering the **pure NIT effect**, they isolated the group that received both the payment and training from those who received only a negative income tax payment.

Given these modifications and timing differences, Cain and Wissoker found only small and inconsistent treatment effects on marital stability. For both white and Hispanic couples, neither the benefits or the training, nor even the interaction of the two had any statistically significant impact on the rate of marital break-ups. For black families, however, negative income tax payments combined with training programs had a statistically significant, destabilising effect.

The impact of the **pure negative income tax plans** on all the groups, was even more uncertain. Half the coefficients revealed a stabilising influence while the other half exhibited a destabilising impact. Even after the site and duration samples were aggregated, only black families felt the (statistically significant) destabilising effects of the

(combined) NIT benefit and training package. This prompted Cain and Wissoker to conclude that the earlier SIME/DIME evidence on marital stability, is neither decisive nor even persuasive.

In response, the authors of the original study (Nancy Tuma, specifically) questioned some of Cain's modifications. In particular, they argued that the isolation of the "pure" NIT from the combined benefit-training package, so reduces the sample size that even chance variations might swamp major trends. They also defended the lack of statistical significance of their estimated coefficients contending that this was to be expected given the small sample size.

We quite agree with the Cain and Wissoker assertion that the Groeneveld et al., evidence about the destabilising impacts of NIT is not only indecisive, but quite unexpected as well. As our review of the non-experimental literature demonstrated, there is no firm evidence of any large destabilising effect of welfare payments on marriages. Neither did the Gary or the New Jersey experiments show evidence of any clear and/or statistically significant, pro-split outcome. Tuma may however be right when she says that the Cain findings are weak as well, because they are based on the "pure" NIT effects. We too agree that such a modification, while essential to prevent a contamination of the true experimental effects,⁹ thins an already very thin sample. To

⁹ Interpreting the impact of a combined NIT-and-training program calls for a great deal of caution. Just like a

illustrate: the entire control group of originally intact families in Seattle numbered 263, of which 31 split up and 53 quit the experiment. Breaking these into even smaller groups (as Cain did), leaves one with almost no sample. Under these circumstances, nobody can infer much as the samples are simply too small and unstable to say anything definitive. Little wonder, therefore, that Cain and Wissoker found little consistency across sites and/or treatments.

Sociologists On NIT Experimentation

Sociologists find income maintenance experiments and their findings flawed for entirely different reasons:

1. Designed exclusively by economists, they allege that the experiments typically reflect little concern for the social and psychological variables which sociologists find interesting. Given this kind of narrowness in the research design, it is inevitable that the experiments will lead to incomplete findings.
2. If women choose to dissolve their unions and become single-parent family heads when provided with a guaranteed minimal income, it need not be because of the

generous NIT plan, a training program can improve the earnings of the husband and thereby stabilise the union. Likewise, the marriage might be destabilised as the training enhances the wife's earning capacity and makes her less dependent on her spouse. So when a family on the combined NIT-and-training program dissolves, we cannot know for sure whether the split was as a result of the NIT payments or the training. Only a "pure" NIT program can show the "true" NIT effect on marital stability.

financial incentive alone. In all likelihood, the money only creates the option for escaping a family situation that is punishing to the wife as well as the children. The underlying causal variables are the negative situation.

3. Finally, while sociologists agree that the idea of a guaranteed income generating income and independence effects is interesting, they nevertheless consider the concept of an "independence effect" as misleading. Since female, single-parent heads of households face substantial difficulties, money matters aside, it is difficult to imagine many women welcoming this kind of independence. Goodwin and Wilson (1978), for instance, surveyed several thousand individuals in Chicago and New York and their respondents were representative of all types of mothers and family heads - welfare mothers who head households, mothers who head households and are applying for unemployment insurance, spouses of men who are applying for the Work Incentive (WIN) program etc. It was abundantly clear from their results that all groups of women prefer living in an intact family to heading one themselves. While those mothers who already are household heads are more accepting of that role as compared to women in intact unions, their low ratings indicate that it is far from a preferred way of life.

The social experiments were, above all, pieces of practical, applied research. They were not intended to elicit specific behavior in the population, but to offer a setting for observation. Socio-economic variables that were judged most likely to represent a wide range of participant responses were incorporated; sometimes they were added to the interviews during the course of the experiment. But despite all the care and caution, there will always be limits on the power of these results to predict the effects of a nationwide NIT program. A number of factors - including the distinctive characteristics of the site (of Seattle and Denver for example), possible problems of self-selection and Hawthorne effects, and the unknown length of time necessary for participants to adjust fully to the program - suggest that caution be applied in generalising these results.

Chapter III

A CHOICE-THEORETIC FRAMEWORK FOR ANALYSING ISSUES IN MARITAL STABILITY - MODEL BUILDING WITHIN THE REALM OF THE ECONOMIC CALCULUS

"Harriett, there comes a time in every man's life when the expected marginal benefit of continued search is just equal to the expected marginal cost of that search. Harriett, that time has come for me. Will you marry me?" (Bill Nissen and Tim Tregarthen: 'The Margin', March, 1988; p.5).

Economists have traditionally focused on the material aspects of family life - the monetary market sector - without concerning themselves much with the relationship between economic factors and aspects of household composition, namely, family formation and dissolution. Interest in this area - the new household (or home) economics - followed in the footsteps of recent extensions of economic theory to cope with issues in human capital (Mincer 1970, 1974; Schultz 1971, 1972; Becker 1964) , the economic value of human time (Becker 1965; Gronau 1973) , the household production function and the family as a decision making unit in consumption and in household production (Becker 1974, 1976, 1981). As a result of these developments it is now possible to analyse marriage as well as other traditionally demographic and sociological aspects of behavior (e.g. divorce,

birth control, child rearing practices, etc.) along with more conventional economic variables within a unified choice-theoretic framework. The central implication of this new approach is that economic analysis need not be restricted only to material goods and wants or to markets with monetary transactions. Rather the economic approach provides a framework applicable to all types of human behavior since its area of expertise is the calculus of choice, and choice is ubiquitous and ineluctible to all types of decisions and to persons from all walks of life.¹⁰

3.1 THE THEORETICAL FRAMEWORK

Becker pioneered the detailed application of economic logic to marriage, divorce, altruism and related topics. Much of his analysis is centred on the familiar models of allocation of time and human capital. He argues that a family's utility is not received directly from its consumption of market goods or leisure, as is the case in conventional models. Instead, the family combines time supplied by family members with goods and services purchased in the market to produce within the household the more basic commodities

¹⁰ Samuelson (1976:244) has however characterised such work as "sterile verbalisations" whereby economists tend to explain familial behavior in terms of the jargon of indifference curves, "thereby tending to intimidate non-economists who may not have mis-spent their youth in mastering the intricacies of modern utility theory". Many non-economists will certainly rejoice to hear their sentiments echoed by so eminent an economist.

which are the true objects of utility. By extending this line of reasoning further, we get the basic framework for the application of economic logic to the marriage market.

3.1.1 The Gain From Marriage And The Incentive To Stay Married

The family utility function is defined by Becker on the n vector of commodities Z and may be written as:

$$U(Z) \quad Z=(Z_i) \quad \text{where } i=1,2,\dots,n \quad \text{and } U'(Z) > 0 \quad (1)$$

It is assumed that the family will behave as if it attempts to maximise (1) subject to its limited capacity to produce Z_i .¹¹

Each of the commodities Z_i is produced according to a household production function:

$$Z=g(X, T_m, T_f)$$

where,

X = goods and services purchased in the market

¹¹ The validity of this assumption has been discussed by Samuelson (1956). In standard terms, a family may be regarded as a group of individuals whose common welfare is a function of the utility of each of its members. Thus in place of (1) we may write a Bergson-Samuelson "family welfare function" of the form

$$W=W(U^1, U^2, U^3 \dots \dots)$$

where there are v number of family members. Samuelson's proof that the family will behave as if it were an individual attempting to maximise (1), assumes no interdependency in utility among family members and no jointness in consumption.

T_m = male time

T_f = female time

g is the household production function which summarizes the technology available for converting market goods and time into the actual source of utility, namely, Z .

There then exists the cost dual of the household production function which gives the minimum average cost of producing units of Z in the household:

$$C = C(P, W_m, W_f)$$

where W_m and W_f are wage rates of males and females respectively (i.e., "shadow" price of leisure time T_m and T_f above).

For married couples this cost function is $C_{mf}(P, W_m, W_f)$; for single males it is $C_m(P, W_m)$ and for single females it is $C_f(P, W_f)$.

A single male would maximize his production of Z subject to the constraint that $T_f = 0$, that is,

$$\text{Max } Z = g(X, T_m, T_f)$$

subject to

(a) the time constraint $T_m + L_m = T$, (L_m = market work)

(b) the goods constraint $PX = W_m L_m + V_m$

where

P = index of prices, W_m = wage rate and

V_m = nonmarket income

and (c) zero female time i.e. $T_f = 0$.

Similarly, a single female would

$$\text{Max } Z = g(X, T_m, T_f)$$

subject to

$$(a) T_f + L_f = T,$$

$$(b) PX = W_f L_f + V_f \text{ and}$$

$$(c) T_m = 0.$$

For single males the maximized value of Z is Z_m while for single females it is Z_f .

A married couple would maximise Z without the third constraint. That is:

$$\text{Max } Z = g(X, T_m, T_f)$$

subject to

$$(a) T_m + L_m = T, \quad T_f + L_f = T;$$

$$(b) PX = W_m L_m + W_f L_f + V_m + V_f.$$

The maximised value of Z is Z_{mf} . The gain to marriage is then

$$G = Z_{mf} - (Z_m + Z_f).$$

If (as is often the case) $W_m > W_f$, then there will be an allocation of resources of family members according to

their comparative advantages. The husband will specialise in market production and the wife will devote most of her time to child rearing, household management and other domestic activities.

To use the language of trade theorists, marriage may thus be viewed as a "trading" contract between men and women, one that can be analysed in terms of the "Heckscher-Ohlin-Samuelson" model. The greater the divergence in the initial endowment which each partner brings to the union,¹² the greater the gains accruing from trade, and hence the stronger the economic motives for keeping the union intact. In the economists' abacus of loss and gain, "sexism" (assuming the feminist allegation to be true), is both 'rational' and 'efficient'. Men and women enter the marriage market with different initial endowments of "home" capital and "market" capital (husbands in general being more generously endowed with the latter and wives with the former). As such, each spouse specialises to his or her mutual advantage - in market production and home activities respectively. The emphasis here is entirely on the 'gains from trade' that will be achieved when trade is based on comparative costs and/or advantages.

Becker (1981:21) writes:

Although the sharp sexual division of labor in all societies between the market and household sectors is partly due to the gain from specialised invest-

¹² Feminists would re-phrase this as: 'greater the extent of institutionalised sexism ...'

ments, it is also partly due to intrinsic differences between the sexes.

While Becker does not wish to base his arguments on biological differences alone, he nevertheless regards the latter as a critical cause of intersex differences in comparative advantage. And basically it is this difference that leads to a home-oriented allocation of time and composition of human capital on the part of women.¹³

3.1.2 Wage Equality (Among The Sexes) And Marital Dissolution

If male and female time were perfect substitutes in both household and market production, in the sense that

$$\begin{aligned} W_m &= W_f \\ MP_m &= Z / T_m = MP_f = Z / T_f \\ \text{and } V_m &= V_f \end{aligned}$$

then

$$Z_m + Z_f = 2Z = Z_{mf}$$

i.e. there is no gain from the marriage.

In other words, the larger the deviation between W_m and W_f , ($W_m > W_f$), greater will be the amount by which Z will exceed combined single incomes and greater will be the incentive to keep the union intact.

¹³ In the final analysis, it does appear that Becker is resorting to the hoary argument that "anatomy is destiny" - that a women's physiological attributes tip the balance towards female specialisation in home production and male specialisation in market work.

Women with higher earnings gain less from marriage because higher earnings reduce the advantages of the sexual division of labor in marriage. In fact higher market wages for working women alters the allocation of their time, the composition of their human capital as well as the household division of labor between spouses. In other words, sex roles are responsive to market forces. Indeed, under the impact of "women's liberation" and the general long-run trend toward women's work, female participation rates have been progressively rising. The accompanying growth in the earnings of working women during the last thirty years, is often cited as a major cause of growth in actual divorce rates during this same period.

In any case, Becker's formulation appear to "explain" or "are consistent" with the facts.

3.1.3 Dissolution And Education

It is difficult to pass definitive judgement on the relation between the level of schooling and the incentive to keep the marriage intact. On the one hand, marriages between highly educated individuals have greater gains because of the spouses' high levels of market skills. On the other hand, they have lower gains because they typically involve less specialisation between spouses. Hence, there is no clear theoretical prediction about the net effect of

schooling on marital stability.¹⁴

Given the mechanics of our model, we can formalise the problem along the following lines.

There are two conflicting facets of education : (a) education as factor-neutral technical change; and (b) as factor-augmenting.

In the first instance, education uniformly reduces the amount of each input required to produce units of Z. For married couples we then have:

$$Z_{mf} = \frac{(W_m + W_f)T + V_m + V_f}{A_m(E_m) A_f(E_f) C_{mf}(P, W_m, W_f)} \quad (9)$$

where E stands for education and the A's are functions whose first derivatives are negative. In the case above, the gains to marriage are positively related to increases in education.

In the second situation, (where education is regarded as a factor augmenting technical change), education improves the efficiency of the time input independently. For married couples, we then have

¹⁴ The Canadian Family History Survey (Table 20: p.30), for instance, failed to uncover any systematic relationship between education and marital disruption rates. In fact, the data suggests a bell-shaped relationship between education and divorce - the dissolution rate being the lowest (9.2%) among two polar groups: those with less than eight years of schooling and those with post-secondary education. (Source: Statistics Canada, Family History Survey, Catalogue 99-955, Ottawa, 1985).

$$Z_{mf} = \frac{(W_m + W_f) T + V_m + V_f}{C_{mf} [P, B_m(E_m)W_m, B_f(E_f)W_f]} \quad (10)$$

where B_m and B_f are functions similar to the A 's. Special conditions must hold to obtain the same results as above. For the second case, the gains from marriage will increase if education raises the nonmarket productivity relative to the market productivity of the spouse specialising in household production. Also there are pronounced marital gains if education raises the relative market productivity of the market specialist.

In reality, however, either of these possibilities may prove difficult or impossible to distinguish empirically.

3.1.4 Dissolution And Search

Until now an implicit assumption was made that perfect information and certainty held for all the agents in the marriage market. This section will incorporate among other things the economics of imperfect information into the framework of utility maximization and the marriage market. In the main what this implies is that persons entering the marriage market do not immediately marry the first reasonable prospect encountered, but try to learn about them and search for still better prospects. Search often takes such diverse forms as parties, dating, church socials etc.¹⁵

¹⁵ Many Japanese couples exchange resumes before marriage detailing factors such as education, family background

Increased search and better information raises the utility expected from a union by enhancing the quality of marital choices. However, time, effort and other costly resources must be spent on search, and the longer the search, the longer the gains from marriage are delayed. As search costs increase, the individual lowers his minimum acceptable offer and widens the boundary of his acceptable set of traits. With the value of additional search reduced by the increase in search costs, greater mismatches become acceptable and, as a result, deviations between actual and optimal sortings become inevitable. Consequently, an increase in search costs can be said to increase the frequency of dissolutions because it increases the incidence of mismatches.¹⁶

etc. In my native Bangladesh, a traditional (predominantly) Muslim society, most marriages are arranged by families according to "family" interest (primarily socio-economic). The higher the family's class membership, greater is the geographical distance that it will traverse in search of the ideal mate. The search process is often long and arduous because of the greater distribution of the marriage market in geographical space.

¹⁶ Canadian statistics show that people in the age group 40-49, who have been married for thirty years, achieved very high dissolution rates - approximately one fifth (19 percent) of marriages of both males and females having been terminated by divorce, with an additional 8 percent of females separated for a total dissolution rate of 27 percent. (Statistics Canada, Union Formation & Dissolution, 1986, p.15). The dissolution rates are so high partly because this subsample of the birth cohort must have married very young - before age "twenty". And in accordance with the tenets of "search theory", people who marry so early inevitably face elevated risks of marital dissolution.

Mismatched unions fail early primarily because of the rapid accumulation of better information about discrepancies in spousal traits after only a few years of marriage.¹⁷ This is why easily assessed traits such as 'difficult' spouses, value conflicts etc., are important causes of early divorces. On the other hand, information which is acquired more slowly - e.g., about earnings potential, extent of deviation between actual and expected earnings, another woman and/or financial conflict - are factors frequently cited by women divorcing much later (after about ten years of marriage).

3.2 SOME EXTENSIONS OF THE BECKER MODEL

We will now attempt some extensions of Becker's theory of marital instability to analyse household transition patterns, first, within a stochastic framework¹⁸ and second, in the specific context of NIT experiments in general, and MINCOME in particular.

¹⁷ In a similar vein, unsatisfactory working conditions, which could not be predicted a priori, constitute an important reason why people quit during the first few years on a job (Borjas 1979).

¹⁸ While discussing the traditional family, Becker (1981; chapter xi) dwells very briefly on the subject of "uncertainty" and the difficulties of relying on ordinary market transactions to take care of exchange. For the most part, however, his book proceeds under the assumptions of "certainty".

3.2.1 Modelling Marital Dissolutions Within A Stochastic Framework

Becker regards the optimal marital decision - the decision to split or stay together - to be one that maximises the expected value of full wealth over the remainder of a person's life. If all compensations between spouses are feasible and costless, an individual will separate only if his or her post dissolution wealth is expected to be greater than his or her wealth in the union.

But in reality dissolutions (specially those via law courts) are not costless and they entail sizeable costs - both emotional and financial.¹⁹ The trial procedure is not only costly and cumbersome, it also requires both spouses to incur potentially large resource costs in preparing for and conducting the trial. It also subjects each to substantial uncertainty as to the outcome.

In other words, what cannot be ignored here is the role of uncertainty. Decisions about the future is (and can only be) fashioned from incomplete information. It is composed under uncertainty, and uncertainty introduces a whole new dimension into the analysis. Sometimes the prospect of hav-

¹⁹ Managing divorces mean big business for the legal profession. About 20,000 American lawyers specialise in divorce, with another 20,000 occasionally handling breakups. The deans of American divorce gurus - Raoul Felder and Marvin Mitchelson - charge as much as \$450 and \$350 per hour respectively, handling much publicised breakups of the rich and famous. Felder - the undisputed 'unplighter of celebrity troths' - earned about \$12 million in 1988 alone. (Time; Jan. 9, 1989: 37)

ing to face the different kinds of uncertainty - e.g., uncertainty surrounding the division of family assets, obtaining child custody, income and job prospect as a single mother with dependent children etc., - is so disturbing, that the individual's primary concern becomes one of reducing uncertainty. This then begets conservatism in decision making and leads to reduced policy action - i.e., a mother with dependent children will hesitate in seeking a separation, even if the financial alternatives to marriage are apparently very tempting. By clinging on to unsatisfying marriages these **risk-averse** individuals are merely opting for greater certainty. Their marriages may be difficult, but divorce is yet more difficult.²⁰ Hence married people often feel trapped for divorce is frightening, painful, expensive and also subject to social disapproval.

To test these arguments, they must be translated into a particular model that can be estimated. Our choice here is the **mean-variance theorem** - the variation routinely used for optimal portfolio choice under uncertainty.

Consider an unsatisfactory marital situation where the female-head is presumed to have in some way calculated the **target level** of her post-dissolution family income. Income

²⁰ The marriage then resembles McCary's (1980:2) **yoked unions** - examples of compromise conformity - where "the couple never go anywhere together because he likes opera and she hates it; she likes movies and he hates them; he likes the symphony and she likes rock concerts. They compromise by staying home and watching TV reruns and feeling resentful and dissappointed".

levels which differ from this target level are less desirable to this individual, and they act as a deterrent in initiating dissolution procedures. The female-head's hierarchy of preferences may be described by a utility function. This function, also known as a disutility function, assumes the form of a quadratic and involves a weighted sum of the squared deviation of the independent variable from its target level:

$$U = -h [Y - Y^*]^2 \dots (1)$$

where

U denotes utility;

Y is actual post-dissolution family income; and

Y* represents its target level.

The variable Y will be predominantly influenced by post-dissolution monetary transfers and earnings (Mo). The latter may be referred to as an "instrument". The manner in which the instrument interacts with the Y variable may be written as :

$$Y = \phi' + A Mo \dots \dots \dots (2)$$

The problem facing the female-head of the household then translates into one of a constrained maximum: maximise U with respect to Mo subject to (2).

3.2.2 Consequences Of Uncertainty

The situation presented above is rather tranquil - the values of the exogenous variable and the parameters are known with certainty. The next step to be undertaken, while not necessarily easy, involves the straightforward manipulation of the instrumental variable M_0 , to attain a position as close as possible to the designated target Y^* . But such a quiescent setting ignores the fact that Equation (2) captures a host of economic pressures that are changeable. The exogenous variable ϕ' and the parameter A could respond to a variety of factors including among other things, male-head unemployment, the specific nature of the legal settlement, default in the payment of alimony or child-support etc. The ensuing analysis considers the consequences of uncertainty surrounding ϕ' and A .

With both ϕ' and A random, the decision procedure must be revised and it must be revised along the lines of mathematical expectation. Now the female-head endeavours to maximise the mathematical expectation of

$$U = -h (Y - Y^*)^2$$

$$\text{subject to } Y = \phi' + AM_0.$$

To determine the expected value of utility we write the utility function as

$$U = -h [\phi' + AM_0 - Y^*]^2$$

Expansion yields

$$U = -h [\phi'^2 + 2A\phi'M_0 + A^2 M_0^2 - 2Y^*\phi' - 2AM_0Y^* + Y^{*2}]$$

Calculating the expectation of U yields²¹

$$EU = -h[\sigma_{\phi'}^2 + (E\phi')^2 + 2M_0 E\phi' EA + M_0^2 \sigma_A^2 + M_0^2 (EA)^2 - 2Y^* E\phi' - 2M_0 Y^* EA + Y^{*2}]$$

where $E\phi'$ and $\sigma_{\phi'}^2$ denote respectively the mean and variance of the of the ϕ' distribution; ρ is the correlation coefficient of ϕ' and A. If $\rho = 0$, A and ϕ' are unrelated on balance. $\sigma_{\phi'}^2$ measures the uncertainty about the value to be assumed by the corresponding variable A larger value of σ implies greater uncertainty.

Given the setup above, the effect of uncertainty may be usefully explored with the aid of graphs. Since Y is a linear function of two random variables, it follows that :

$$Y^2 = \phi'^2 + 2\phi' A M_0 + A^2 M_0^2$$

$$E(Y^2) = E(\phi'^2) + 2M_0 E(\phi') E(A) + M_0^2 E(A^2)$$

$$\text{or, } \sigma_y^2 = \sigma_{\phi'}^2 + 2\rho M_0 \sigma_{\phi'} \sigma_A + M_0^2 \sigma_A^2 \dots \dots \dots (5)$$

(the mean of the two random variables being zero, i.e. $E(\phi') = E(A) = 0$).

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$$E(2\phi' A M_0) = 2M_0 [\rho \sigma_{\phi'} \sigma_A + E(\phi') E(A)] \\ = 2M_0 \rho \sigma_{\phi'} \sigma_A + 2M_0 E(\phi') E(A)$$

Equation (5) when plugged into Equation (4) simplifies the latter into²²

$$U'' = \delta^2 y + (EY - Y^*)^2 \dots\dots\dots(6)$$

$$\text{where } U'' = -EU / h.$$

Equation (6) generates a circle in δy and EY , centred at the point $(0, Y^*)$ and having the radius $/ U''$. The figure below illustrates for $0 < U''1 < U''2 < U''3 < U''4$.

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$$(EY)^2 = [E(\phi') + M_0 E(A)]^2$$

$$\text{i.e. } E(Y) = E(\phi')^2 + M_0 E(A)^2 + 2M_0 E(\phi')E(A)$$

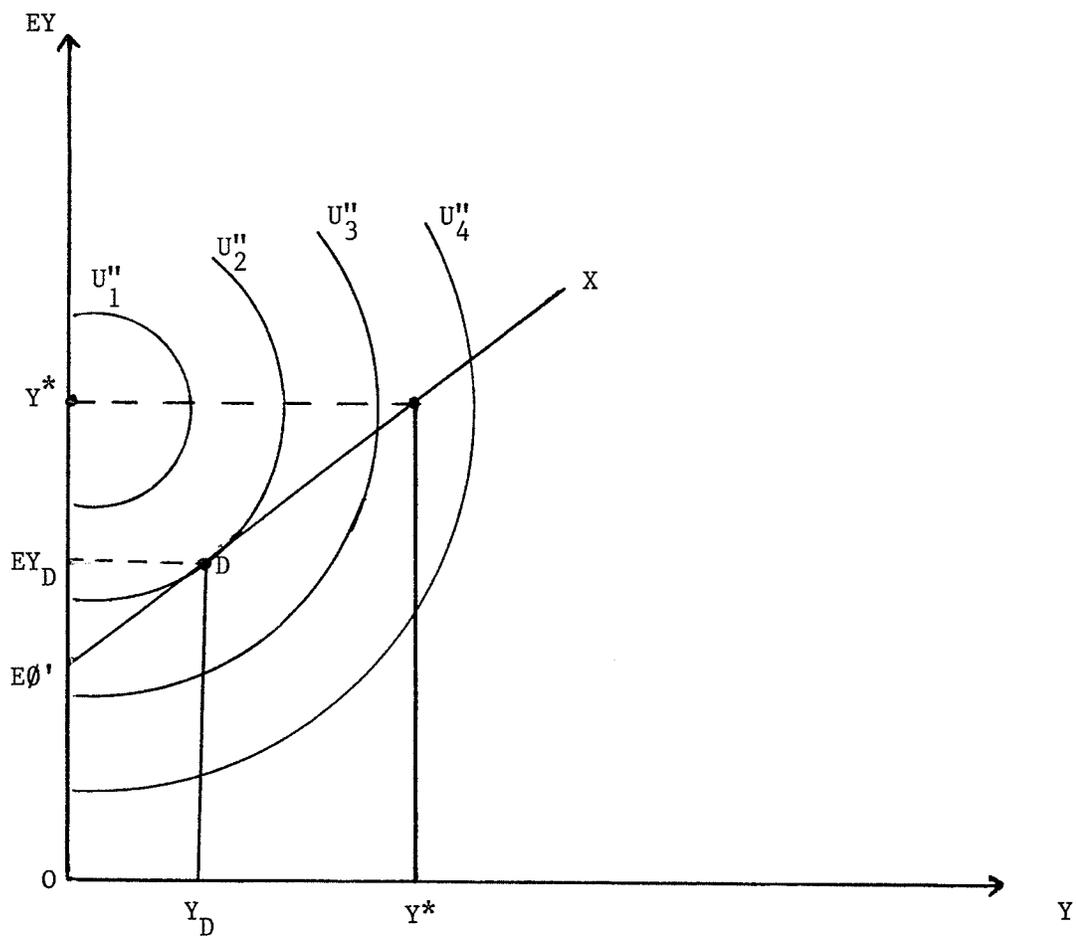
$$\text{Now } 2Y^*E(Y) = 2Y^* [E(\phi') + M_0 E(A)]$$

$$\text{i.e. } 2Y^*E(Y) = 2Y^*E(\phi') + 2Y^*M_0E(A)$$

$$\text{therefore, } (EY - Y^*)^2 = (EY)^2 + 2Y^*EY + Y^{*2}$$

$$\text{i.e. } (EY - Y^*)^2 = E(\phi')^2 + M_0^2 E(A)^2 + 2M_0 E(\phi')E(A) + 2Y^*E(\phi') + 2Y^*M_0E(A)$$

FIGURE - I
DECISION MAKING UNDER CONDITIONS OF UNCERTAINTY



Consider first the simplified situation where uncertainty only affects A, i.e., where $\sigma_{\phi'} = 0$ and $\sigma_A > 0$. Equation (5) then reduces to:

$$\sigma_y = M_0 \sigma_A$$

therefore, $M_0 = \sigma_y / \sigma_A$.

Given the linear relationship $Y = \phi' + AM_0$, it follows that

$$E(Y) = E\phi' + (EA/\sigma_A) y \dots\dots\dots (7)$$

Equation (7) describes the line CX in the figure above, with intercept $E\phi'$ and slope EA/σ_A .

Given the configuration above, two distinct situations may be identified.

Case (a): $M_0 = 0$ will produce $\sigma_y = 0$ and $EY = E\phi'$, i.e., point C in the figure. This corner solution describes wives who will cling on to unsatisfying marriages because of:

1. Uncertainty surrounding the court's decision as regards to post-dissolution property transfers, specially when it involves sizeable tangible assets like family homes, monetary savings etc.; and
2. Uncertainty about the size of post-dissolution income transfers because of possible reluctance on the part of the husband to live up to his court-ordered support obligations.

Case (b): Higher levels of post-dissolution transfers continually raise EY , but they also increase the uncertainty about Y . As may be observed from the graph, increments in Y first raise and then lower the female-head's utility.

The target ($EY=Y^*$), though attainable, is associated with a very high level of uncertainty (σ_{y^*}). A primary reason being that Y^* can be had if following a long (and often bitter) court battle, there is a fair and equitable distribution of all marital assets. (This however is only one of the many determinants of expected separated wealth). While the financial costs of a dissolution through the courts are staggering, their outcome is also uncertain. As such the risk-averse housewife will sacrifice the target altogether and direct her attention away from the preselected goal (Y^*), in order to acquire greater certainty.

The optimum point is represented by D. This situation can be interpreted as one where a mother with dependent children may choose not to initiate legal divorce proceedings. Instead she may choose to settle out of court. While such a course of action might yield less in the form of post-dissolution income through asset transfers, it is preferred because of the greater certainty that it promises about the value to be assumed by Y .

The crux of this line of reasoning is that the presence of children coupled with the uncertainties associated with post-dissolution income transfers, often prompts the wife to adopt a conservative stance. In some instances (Case A), she might even chose to cling on to an unsatisfying marriage.²³ This is a principal reason why first marriages include a certain proportion of **stayers** who will never consider divorce.

In others she will go for an out of court settlement, because of the expected disutility accruing from legal wrangling.²⁴ Even if the wife knows with certainty the outcome of the impending court battle, this knowledge is of little value if the husband fails to honour his commitments (e.g., withholding alimony and/or child support payments). Suppose the wife anticipates such a possibility, but the estranged husband in fact offers her a good faith bargain - i.e., he fully intends to honour the court's ruling. The result is an **asymmetry of information** - another reason why the income target will be sacrificed.²⁵

²³ "Divorce in the eighties is divorce on hold", says Marna S. Tucker, a divorce attorney in Washington, D.C. "When they subtract taxes and figure out what's the minimum amount they need to live on, and they see what's left, a lot of them are saying : ' may be when the kids are grown up'. And they stay in the marriage". (Newsweek, August 24, 1987:p.53).

²⁴ Since most divorces are conducted as negotiable business arrangements, settling out of court is often in the best interest of either party. One example (an extreme case), is the 1986 out of court settlement that saved more than \$400 million for real estate mogul Sol Goldman.

²⁵ Robert Frank (1989:5) cites an interesting situation

Such fears are not unfounded. In Canada up to 75 percent of divorced spouses fail to pay court ordered alimony and family support, at a cost of \$1 billion a year to Canadian tax payers (Macleans, May 13, 1985). Our neighbors, south of the border, are equally evasive. In a 1975 survey of American women taken for International Women's Year (IWY), for instance, just 44 percent of the separated or divorced mothers reported that they had been awarded child support. However, less than half of these women reported receiving child support on a regular basis, and one third said they received it rarely or not at all. In Wisconsin county, a sample of 163 fathers who were placed under court ordered support obligations following their divorces was followed over a period of ten years. After the first year only 38 percent were in full conformity with their obligations and 42 percent had refused to pay. By the end of the tenth year the percentage in full compliance had dwindled to 13, whereas 79 percent were making no payments at all (Jones et al., 1976). In fact the situation has been so bad that in 1975 Congress passed legislation creating a federal office of Child Support Enforcement and required each state to establish a corresponding agency to help enforce child support for all

where **assymetric information** can have disastrous consequences. He describes the case of a kidnapper who has a sudden change of heart. He wishes to set his hostage free but is worried that once free, the man will report him to the law. His victim, however, promises not to do so and fully intends to honour this pledge. The problem here is an **assymetry of information**, with the kidnapper unsure as to whether his hostage will really keep his word. And so the kidnapper reluctantly concludes that he must kill him.

children dependent on AFDC. Finally, the 1984 amendments required states to adopt income withholding for child support after a one-month lapse in payment.

Given this kind of a scenario, if a mother with dependent children decides against going for a dissolution she is only opting for maximum possible certainty.

A divorced husband's non-compliance with court-mandated child support payments can be explained by adding an extra dimension to Becker's **marital-specific capital** hypothesis. Children being self-produced by each family (using, for example, market goods and services, the parent's own time), they are what Becker calls **investments** specific to a particular marriage. Analytically, this implies that children are a **couple-specific public or collective good** in the sense of Samuelson (1955). It follows, therefore, that the efficient allocation of familial resources between public and private uses depends in a substantive way on whether the marriage is intact or dissolved.

In the event of a divorce, the non-custodial parent (usually the father)²⁶ has less contact with the children and as

²⁶ In Canada, mothers have won custody battles nearly five times as often as estranged fathers. As such, female-headed households easily outnumber male-headed (lone parent) families - their numbers being 534,158 and 152,914 respectively, according to the 1984 Family History Survey. (Source: Statistics Canada, Lone Parenthood: Characteristics And Determinants, Catalogue 99-961, Ottawa, 1985: p.26).

such derives a smaller measure of utility from them. Additionally he recognises that no matter what the courts say, familial responsibilities will now rest largely on his ex-wife's shoulders obliging her to act as if these children were her responsibility alone. Since she has no choice but to do an effective job, the father will in all likelihood reduce his efforts to a minimal level (even default on court ordered support payments). This is the classic **free-rider problem** - an ex-husband clinging on to his claim of fatherhood, without having to contribute to the costs of child rearing. Divorce and the consequent non-proximity, thus leads to a less than efficient allocation of resources to the well-being of the children - the family's "public" good.

In an **intact** union, on the other hand, proximity and altruism serve to overcome this "free-rider" problem.

3.2.3 The Hypothesis Of Habit Persistence

The wives' reluctance to dissolve even unsatisfactory unions is also in accord with the **hypotheses of habit persistence** (as propounded by Duesenberry and Modigliani, 1947), wherein the housewife merely tries to continue prior consumption patterns because of habits acquired from experiences related to consumption. As Duesenberry puts it, it is harder for a family to reduce its expenditures from a high level than it is for a family to refrain from high expendi-

tures in the first place.²⁷

3.2.4 Economies Of Scale

A final explanation for wives clinging on to unsatisfying marriages revolves around lost economies of scale. When many family members live together there are items of nearly fixed costs (e.g., housing) that can be spread around so that the per capita cost of maintaining a given standard of living is less than what it is for a smaller family. When couples divorce these benefits are reduced - an additional reason why the economic well-being of female-headed households compares unfavorably with that of continuously married couples.

²⁷ An earlier statement on the role of habits in consumption behavior can be found in *The General Theory*. Specifically,

The fundamental psychological law ... is that men are disposed as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income...

man's habitual standard of life usually has the first claim on his income, and he is apt to save the difference which discovers itself between his actual income and the expense of his habitual standard... (p.96-97).

3.2.5 The Principal-Agent Model

This entire line of reasoning can be reworked in terms of the **principal-agent model**. As this theory goes: whenever one individual depends on the actions of another, an **agency relationship** arises. The individual taking the action is called the **agent** while the affected party is referred to as the **principal**.²⁸ In our model of marital disruption, the husband can be considered the 'agent' and his estranged wife, the 'principal'. The challenge in this agency relationship arises whenever - which is almost always - the ex-wife (principal) cannot perfectly and costlessly monitor the agent's action (e.g., with respect to alimony payments, child support etc.). If information flowed costlessly and perfectly, the wife would know exactly how the agent would behave. But in reality full information is rarely available to any party, a problem further compounded by the fact that there is also considerable divergence of interests between the agent and the principal.

The question then becomes how to structure an agreement that will induce husbands (agents) to serve their ex-wives (principal) interests, without sacrificing too much of their own. In economic parlance, since the **first best outcome** - an equitable distribution of all marital assets and full compliance with alimony and child support payments - can be

²⁸ In common usage, a doctor is the "agent", his patient is the "principal"; the lawyer is the "agent", and his client, the "principal".

achieved only in the unrealistic world of costless information flow, the divorced/separated wife tries to make the best of the situation. That is, she opts for what is called a **second best** solution (e.g., taking recourse to an out-of-court settlement). All these various elements and considerations being integral parts of all spouses' perception of post-dissolution costs and benefits, we felt it necessary to take them into account in our extension of the Becker et al (1977) theory of marital instability.

3.2.6 Dissolution And Investment In Marital Specific Capital

Becker argues that marital dissolutions are less likely among couples that have engaged in what he calls the **accumulation of marital specific capital** - children being the prime example. Since such an investment is less valuable in the event of a split, (one parent always having less contact with the children after the divorce), the presence of children acts as a deterrent to dissolutions. Becker goes on to extend this line of reasoning even further:

(a) the accumulation of marital specific capital is discouraged by the prospect of divorce, which is why trial or consensual marriages produce fewer children than legal marriages; and

(b) marriages between persons of different races and religions (negatively sorted variables) have significantly fewer children because they are expected to be less stable. In other words, couples facing higher probabilities of dissolution (as in negative assortive mating), tend to invest less in marital specific capital not only in the early years, but in subsequent periods as well because of the dangers of a possible dissolution.

In this context we would like to suggest an alternative to Becker's interpretation. Our view is that Becker overemphasises the stabilising influence of children, and in the process overlooks the possibility that the effect of offsprings may have been obscured by the confounding influence of the length of marriage. After all, by Becker's own admission, marriages that survive the early years, have done so not by chance but in the aftermath of better information about the compatibility of spouses. The accumulation of children (i.e. marital specific capital) by these families is really a function of their tested compatibility. As such, offsprings can also reinforce the already strong bonds characterising their parent's union. To illustrate:

$$\begin{aligned} \text{Let } P &= f(S, L) \\ \text{with } \partial P / \partial S &= f_s < 0; \quad \partial P / \partial L = f_L < 0. \\ \text{Let } S &= h(P, L) \\ \text{with } \partial S / \partial P &= h_p < 0; \quad \partial S / \partial L = h_L > 0. \end{aligned}$$

Where

P is the probability of divorce, S is investment

in marital specific capital (children) and L is the length of the marriage.

Then

$$dP/dL = f_L + f_s(dS/dL) < f_L$$

i.e. the stabilising influence of the length of marriage ($f_L < 0$), is further reinforced by the presence of children.

3.2.7 Children, Opportunity Costs And Marital Instability

We will now develop an alternative approach to demonstrate the stabilising influence of children on their parent's union. This will be done in terms of opportunity costs, the price of human time and heterogeneity.

Whereas Malthus assumed that the price of children would remain constant, the rise in the price of human time in the context of the modernising process implies that the cost of children is functionally dependent on the human capital embodied in adults, especially the mother. Bearing a child and caring for the infant are highly labor intensive activities measured in terms of the input of the mother's time. As such, the opportunity costs (in terms of foregone earnings) will be higher, the greater the income opportunities women have outside the home.

Further complicating this simple **cost-of-time hypothesis** is the fact that children are a **heterogenous** stock of human capital. In their infancy they are highly labor intensive in terms of the input of their mother's time; with age they become more costly in terms of the financial resources that are required for their schooling and/or other training that will eventually augment the quality of their human capital. If (as may often be the case), $W_m > W_f$, then in accordance with the theory of comparative advantage, the father of the multi-person household specialises in market activities and the mother in household production.²⁹ Thus, while "daddy" is less committed to the care of the children in their infancy, it is largely from the second phase that his sacrifice (in terms of financial resources, companionship time etc.,) begins to acquire increasing importance.

In a nutshell, children are **doubly** time intensive:

(1) the bearing and rearing of infants is a very labor intensive activity and the financial sacrifices made by parents during these early years, is a crucial determinant of their own standard of living;

²⁹ The Canadian Family History survey shows that aspects of household production - the exigencies of marriage, pregnancy and child care - had a major impact on the continuity of careers for a large majority of women. Almost two-thirds (64 percent) of female respondents with a work interruption, reported that it was due to marriage, pregnancy or child care. The most striking feature of this statistic is its strong sex differential. No male respondent (less than 1 percent), cited these as reasons for their work interruption.

(2) in terms of **consumption time**, the process of enjoying the fruits of all this investment involves for the parents, a waiting period of considerable length, the economic value of which is very great. Once again, the required measure of cost is one that corresponds to the concept of opportunity cost. After all, the family could export this time of the husband and wife to the labor market and in return "import" goods at terms of trade determined by the market prices of labor and goods, and by the earning capacities of the husband and wife.

Hence, having sacrificed so much time, energy and resources in the caring and rearing of children the parents will want their heavy investments to pay off. From this emerges the not-so-startling conclusion that the presence of children lowers the probability of a dissolution. Rather they contribute to the strengthening of the bonds binding their parent's union.

In less developed societies, the mother's time is cheap. The costs of bearing and rearing children are correspondingly lower, even though the task is equally labor intensive. However, in terms of the satisfactions and producer services that families derive from their children, parents in underdeveloped societies have a head start. An adequate number of children provide help in household work and in family endeavours consisting mostly of farm work. As adults they often provide food and shelter for their aging and retired parents.

LDC children thus perform a substantially larger economic role compared to their counterparts in developed societies. In the impersonal language of economics, it is the risk of losing all these guaranteed gains that prevents the widespread incidence of dissolutions among LDC parents.³⁰

3.3 MODELLING MINCOME'S MARITAL STABILITY EFFECTS

Becker views welfare payments as the poor woman's alimony which, like a higher wage rate for women, reduces the gains from marriage by increasing the expected income outside of marriage. In fact any system of transfers in which payments depend mainly on a household's total income - be it welfare, negative income tax or AFDC - encourages dissolutions because it compensates for the reduction in resources available to the spouses as a consequence of the dissolution.

MINCOME (like any other NIT program) has two opposing effects: (a) it tends to raise family income which in turn stabilizes a marriage (the income effect) and (b) since it guarantees support to married as well as unmarried people, MINCOME improves the financial alternatives to marriage and thereby reduces the dependence of wives on their husbands.

³⁰ Adam Smith, observing the high rate of population growth in the American colonies, suggested that the income children could generate in the colonies was very high, and that this was a factor in the decision to have them. "The labour of each child, before it can leave (the parent's) home, is computed to be worth a hundred pounds clear gain to them," Smith wrote.

Groeneveld, Hannan and Tuma call this the "independence effect"³¹ and it is destabilizing. This is the **income-independence model** and it suggests that depending on the strength of these two opposing effects, MINCOME may increase the marital dissolution rate, decrease it or leave it unchanged.³²

To formalise the stabilising income effects of MINCOME, consider a time dynamic linear system with three variables:

M = monetary transfers from a NIT plan

A = the family's anxieties (often of a monetary nature) generating marital stress

U = economic and other uncertainties.

As U increases (as a result of, say, prolonged periods of male-head unemployment), so does A; but as A increases (a signal that the family's income situation is deteriorating), so does M (the level of monetary transfers under the NIT plan). The latter has a compensatory feedback effect on A,

³¹ Economists refer to the "independence effect" as the "price" effect (Cain, 1986) or the price subsidy to being divorced. The price subsidy also affects the husband by reducing his subjective obligation to pay child support or alimony.

³² In commenting on the impact of NIT, Becker (1981:230) appears to concentrate only on the independence effect: "...a negative income tax system...raises separation and divorce rates among eligible families in that the incomes of divorced and separated persons are raised relative to the incomes of married persons."

reducing it, which in turn helps stabilise the union.

A good rendition of the causal transmission is obtained by adding causal influences into a given variable to obtain:

$$dM/dt = c_1 A$$

$$dA/dt = c_3 U - c_2 M$$

where $c_i > 0$ ($i=1,2,3$). The variable U can be taken as parametric. Combining c with U and writing U' for $c_3 U$

$$dM/dt = c_1 A$$

$$dA/dt = U' - c_2 M$$

Forming column vectors,

$$\begin{bmatrix} \frac{dM}{dT} \\ \frac{dA}{dT} \end{bmatrix} = \begin{bmatrix} c_1 A \\ U' - c_2 M \end{bmatrix} = \begin{bmatrix} c_1 A \\ -c_2 M \end{bmatrix} + \begin{bmatrix} 0 \\ U' \end{bmatrix}$$

Hence, we can write

$$d/dt \begin{bmatrix} M \\ A \end{bmatrix} = \begin{bmatrix} 0 & c_1 \\ -c_2 & 0 \end{bmatrix} \begin{bmatrix} M \\ A \end{bmatrix} + \begin{bmatrix} 0 \\ U' \end{bmatrix}$$

and so

$$dX/dt = AX + B$$

where

$$X = \begin{bmatrix} M \\ A \end{bmatrix} \quad A = \begin{bmatrix} 0 & c_1 \\ -c_2 & 0 \end{bmatrix}$$

$$B = \begin{bmatrix} 0 \\ U' \end{bmatrix}$$

It follows that the functionalist system, so explicated, forms a linear dynamic system such that:

1. the state is the particular treatment level assigned and the amount of marital stress the family is currently undergoing - these being the two dynamic variables;
2. the parameters include not only the uncertainty U' , but the coefficients c_1 and c_2 indicating the amount of effect each variable has on the other;
3. the dynamic law is the linear system: $dX/dt = AX + B$;
4. the equilibrium state X_e satisfies

$$AX_e + B = 0$$

$$AX_e = -B$$

$$X_e = -A^{-1}B$$

and since

$$A^{-1} = \begin{bmatrix} 0 & -1/c_2 \\ 1/c_1 & 0 \end{bmatrix}$$

we have, using $-A^{-1}$,

$$X_e = \begin{bmatrix} 0 & 1/c_2 \\ -1/c_1 & 0 \end{bmatrix} \begin{bmatrix} 0 \\ U' \end{bmatrix} = \begin{bmatrix} U'/c_2 \\ 0 \end{bmatrix}$$

Hence in equilibrium,

$$M_e = (c_3/c_2)U, \quad A_e = 0$$

That is, in equilibrium, the volume of monetary transfers under the NIT plan is a linear function of uncertainty, with coefficients c_3 / c_2 , while the level of marital stress is reduced to zero.

3.4 HYPOTHESES

Clearly, no single tractable or testable model of the full range of familial behavior is yet feasible. At best, the present state of the economic theory of familial behavior provides a framework within which a large number of hypotheses may be developed and their implications tested against one another.

In the sections to follow, we propose to test the following hypotheses - these being analytically tractable and potentially capable of yielding implications that may be tested using the MINCOME data.

I. The impact of MINCOME on marital dissolution depends upon how the pattern of effects are accounted for by the income and independence effects. The income effect decreases the marital dissolution rate by improving the family's economic well-being. The independence effect increases the dissolution rate by reducing the economic dependence of the more dependent partner (usually the wife) on the marriage.

Depending on the strength of these two opposing effects MINCOME may increase the marital dissolution rate, decrease it or leave it unchanged.

II. We will test the following Becker hypotheses: (a) higher relative earnings for males will result in greater number of two-parent families³³ (b) a spell of male-head unemployment often indicates longer run difficulties in the labor market that were not anticipated at the time of the marriage. The consequent downward revision in the husband's expected financial contribution to the union may so reduce the gains from it, that a dissolution emerges as the optimal alternative.³⁴ In contrast Becker expects an increase in the ratio of wife's earnings to the husband's and also the wife's work history - her employment stability - to be inversely related to family stability.

III. People who marry young are more susceptible to divorce because of the limited time invested in search. The resulting discrepancy in spousal traits raises their chances of a dissolution.

³³ This is what sociologists call the **role-performance model**. Basically it implies that most working and middle-class families have traditional views about the role the husband is to perform. The husband is expected to be a breadwinner and if he is not fulfilling his role, marital tensions result.

³⁴ Social psychologists say the same thing though in different words: "...congruence in role perceptions as well as compatibility between role expectations and actual performance would be associated, in general, with high happiness..." (Hicks and Platt, 1970). Country singers put it more bluntly-"Nobody loves you when you are down and out".

IV. Chances of a dissolution will decline with marital duration owing to: (a) the acquisition of better information about spousal compatibility; and (b) the consequent investment in marital specific capital (in the form of offsprings).

V. Uncertainty shrouds post-dissolution property transfers and the performance of spousal responsibilities, introducing a whole new world of **risk and uncertainty** into the picture. Cost and uncertainty considerations suggests that in such a situation it is in the best interest of both parties to avoid a legal battle altogether by seeking, whenever possible, alternative procedures for resolving their differences. Hanging on to unsatisfying marriages or opting for out-of-court settlements are two popular alternatives.

VI. The final hypothesis is actually an extension of Becker's views about specialization within the household. Marital duration promotes stability because over time the wife's investment in household or market skills appreciate much less rapidly than the husband's. In fact, market skills will probably depreciate with the passage of time because of her discontinuous participation in the labor force. This (coupled with the fact that typically it is she who must care for the children and work outside the home, in the event of a divorce), begets conservatism in decision making. A wife in this kind of circumstance will often decide against a dissolution, choosing instead to hang on to

an otherwise unsatisfactory union.³⁵

Our goal here is not any encyclopedic treatment of the causes of marital dissolution. Instead our goal is simple: economic modelling of the process by which changes in income guarantees and tax rates affect rates of marital dissolution. To this end, we will rely heavily on the logic of experimentation. While never doubting that all marital dissolutions cannot be attributed to economic causes alone, we believe that most splits are due to economic decision making — a natural consequence of the inevitable problems and conflicts that arise in households threatened by economic insecurity.

³⁵ This raises the question about the relationship between marital happiness and stability. It is generally assumed that these two are interdependent. However there is ample empirical evidence showing that personal happiness is not necessarily the *sine qua non* of a stable union. Cuber and Harroff (1963:141), for instance, found in a sample of adult, upper middle-class men and women who had been married for at least ten years, that even in America with its (over)emphasis on 'personal' happiness, stable marriages are not necessarily deeply satisfying as well.

Chapter IV

MINCOME DESIGN, EXPERIMENTAL TREATMENTS AND ISSUES IN THE MEASUREMENT OF EXPERIMENTAL EFFECTS

This chapter will review the Manitoba Basic Annual Income Maintenance Experiment (MINCOME), highlighting those aspects that are of particular relevance to the analysis of marital stability. Also included herein will be a discussion of the methodology to be used in estimating the experimental effects.

4.1 THE EVOLUTION OF A GUARANTEED ANNUAL INCOME MAINTENANCE EXPERIMENT IN CANADA

The origins³⁶ of the Manitoba experiment can be traced to the War on Poverty in the United States and the discussions held there during the sixties, on the best method for delivering a guaranteed annual income. On the popular front, it was eye-openers like Michael Harrington's *The Other America* (1962) and Dwight MacDonal'd's *Our Invisible Poor* in The New Yorker (1963), that shocked and shamed a nation accustomed

³⁶ This discussion greatly oversimplifies the ideological roots of Canada's only experimental test of the guaranteed income concept. For a detailed account of the developments preceeding its introduction see Derek Hum, "Poverty, Policy And Social Experimentation In Canada", in Economic Council of Canada, Reflections On Canadian Incomes (Ottawa, 1980), p.307.

to believing that poverty was a relatively minor residual or "afterthought" in the American dream. Academia fuelled this fire of social consciousness through the development of two key theories or perspectives:

1. Oscar Lewis' (1959, 1961) **culture of poverty** perspective may be interpreted as a set of values, beliefs, psychological attitudes and behavior that combine to form a way of life or culture among the poor. This in turn is detrimental to their general well-being because once in existence, it transforms itself into a **vicious, self-perpetuating cycle** of hopelessness and despair (Harrington, 1962:21-23), one that is primarily responsible for the growth of the "underclass" in American society.
2. Simultaneously, a somewhat broader perspective came forth in the guise of the **institutional critique** of the "culture of poverty" thesis. The institutional critique stressed that the incidence and aggravation of poverty ought not to be attributed to individual failures alone. Rather, the problem is "structural" in nature, i.e., related to poor education, health, racial discrimination, broken homes etc. As such its origins ought to be traced to elements inherent in the structure of the society itself - in the institutional arrangements that systematically propagate the perpetuation of poverty.

It was in the midst of all this debate and deliberation, that President Lyndon B. Johnson launched his **Unconditional War On Poverty** in his message to Congress on March 16, 1964:³⁷

I have called for a national war on poverty...because it is right, because it is wise and because for the first time in our history, it is possible to conquer poverty... It is a total commitment by this President, and this Congress, and this nation to pursue victory over the most ancient of mankind's enemies...

A similar sentiment was echoed by the 1964 report of the US Council of Economic Advisors:

Conquest of poverty is well within our power. About \$11 billion a year would bring all poor families up to the \$3000 income level we have taken to be the minimum for a decent life. The majority of the nation could simply tax themselves enough to provide the necessary income supplements to their less fortunate citizens.(p.77).

Within such a climate of concern for the poor, income maintenance experimentation³⁸ was initiated with the idea of

³⁷ Reflecting on the origins of social experimentation in the United States, Robert Solow (1986:220) muses: "why was there back in the 1960s and 1970s a brief flicker of interest in the negative income tax, intense enough to give rise to expensive experiments?I think I remember some of the reasons. There was a feeling that we were at last in a position to eliminate poverty, that it was the right thing to do and that the direct way to do it was to transfer income directly to people who would otherwise be very poor".

³⁸ The idea of social experimentation was originally conceived by Dr. Heather Ross, while she was a fellow working on her dissertation in the US Office of Economic Opportunity (OEO). But at that time her proposal for large scale social experiments was regarded as unrealistic because of the inability to control the environment within which the experiment would occur. However, by combining the princi-

developing data to guide policy formulation. Four separate large-scale studies have been conducted since 1968:³⁹

1. The earliest project was the **New Jersey Experiment**, which ran from 1968 to 1972 and studied primarily two-parent families in urban areas in New Jersey and Pennsylvania.
2. The **Rural Income-Maintenance Experiment**, administered in counties in Iowa and North Carolina between 1969 and 1973, included both black and white two-parent families as well as some female-headed households.
3. The **Gary, Indiana Experiment** began in 1970 and covered a sample of black urban families, focussing particularly on single-parent (female-headed) households.

ples of random assignment with the modern ability to handle large masses of data on high-speed computers, a workable design for a NIT experiment was eventually worked out.

³⁹ Besides social experimentation, economists have also occasionally experimented with laboratory animals to test whether economic theory applies to species other than humans. In one such attempt, rats were placed in chambers equipped with two levers. Pressing the first brought forth water, while pressing the second rewarded one with food. The rats subsisted on a fixed "budget" - a total of 200 presses per day. The price of food was then raised (by reducing the amount of food per press), to test whether the **income** and **substitution** effects of a price change applied to the applied to the animal kingdom. It was discovered that the rats responded by consuming less food via both the "income" and "substitution" effects. In other words, the "demand curve" for rats was (in accordance with the theory of consumer choice), **negatively** sloped.

4. The **Seattle/Denver Experiments (SIME/DIME)** were the last in the series running from 1970 to 1976. They were the largest and most expensive of the experiments, and most comprehensive in nearly every respect. Compared to their predecessors, more families - black, white and chicano - were enrolled; families were chosen to represent a greater range of income and age levels; single individuals were eligible; more generous financial treatments were offered; and families were followed for longer periods of time.

In short, these were social research enterprises of massive dimensions each offering a wealth of information on welfare issues, on the effects of income maintenance on work and family behavior and on questions of program administration and finance.

While Canada did not have an officially declared "War on Poverty", she was headed roughly in a similar direction. The Economic Council of Canada (fifth and sixth annual reports) documented the severity of the situation; both the **Real Poverty Report** (Adams et al., 1971) and the report of the **Special Senate Committee on Poverty in Canada** (1971) argued that the "guaranteed annual income" was an idea whose time

had come.⁴⁰ The comprehensive **Castonguay-Nepveu Report** recommended consideration of a two-tiered guaranteed annual income; the Department of National Health and Welfare while rejecting GAI as an immediate option (in its 1970 white paper "Income Security For Canadians"), was strongly supportive of further research on such a program.⁴¹

The idea of a guaranteed annual income thus appeared to enjoy support at every conceivable level.⁴² The idea that it would extend benefits without the stigma generally associated with welfare payments, excited egalitarians who have always favoured income distribution; the fact that it would help out financially strapped families, thereby possibly strengthening their withering bonds, appealed to traditionalists who believe in the retention and growth of the family as a key social institution; and finally, because NIT plans would provide assistance in 'cash' rather than in 'kind', the individualists - people committed to the autonomy of the individual - were pleased. Given the width and breadth of

⁴⁰ The former argued that "the case for a guaranteed annual income is unassailable" (Adams et al., 1971:90) and the latter that "the Committee sees the Guaranteed Annual Income as the first firm step in the war against poverty" (1971:xvii).

⁴¹ In fact the Canadian scene witnessed such a deluge of discussion and debate that W.E.Mann (1970:vii) quipped: if speeches, reports, inquiries and press coverage could beat an enemy then poverty in Canada would have been as extinct as the dodo by late 1969.

⁴² "The curse of the poor is literally their poverty. Give them more money", urged Paul Samuelson, "and not only they but their progeny can break through the vicious circle" (Congressional Record; Aug.4, 1969:22188).

its popular support, political blessing was not long in coming. The federal government soon announced the creation of a fund to cover 75 percent of the cost of any pilot project, testing the feasibility of translating GAI into an effective program. Manitoba's NDP premier, Edward Schreyer, indicated his interest in such a project and accordingly the Province of Manitoba submitted a research proposal (1973) to the Department of National Health and Welfare. This was approved in principle within a two month period, and subsequently **MINCOME** was announced February 22, 1974 as a \$17.3 million jointly funded federal-provincial project.⁴³

4.2 OVERVIEW OF MINCOME

Designed to evaluate the consequences of an alternative type of public welfare - a system of negative income taxes (NIT)⁴⁴ - **MINCOME** was not merely a pilot project or a test

⁴³ The sum seems huge when compared to outlays on standard socio-economic research projects. But the justification is that the results accruing from the experiments will serve as the basis for national programs which will eventually involve billions of dollars. As such, even these seemingly large research outlays are small, if they help policy makers to avoid errors in the later implementation of the national programs.

⁴⁴ The concept of an NIT is well known. Simply stated, an NIT plan is defined by two parameters: the income guarantee level (G) and the tax rate (t). G is always adjusted for family size, with larger families entitled to bigger guarantees. The tax rate (t) shows the amount by which payments are reduced for every dollar of earned income. **MINCOME** was designed to test for optimal combinations of G and t - i.e., to deduce experimentally, which particular combination (or combinations) produce the most desirable behavioural response.

implementation of the NIT concept. Rather, it was a social experiment of massive proportions:

the screening process surveyed 24000 families; 3400 of these were selected for the "baseline" survey; and from this baseline, a final sample of approximately 1700 families were enrolled in the experiment and re-surveyed over a four year period (1974-1978).

The final group (comprising roughly the poor and working poor), were divided into **experimentals** and **controls**. The experimental families - the **treatment group** - were assigned to a complex of eight different treatments consisting of various combinations of "guaranteed annual income support" and NIT rates. The control families were to serve as the "reference group" against which the various NIT plans were to be compared.⁴⁵

MINCOME established three discrete guarantee levels. In 1975, when payments commenced, the guarantee levels were \$3,800, \$4,800 and \$5,800 for a family of four (two adults and two children).⁴⁶ Since support levels were also indexed

⁴⁵ A full description of MINCOME and its allocation model is beyond the scope of this chapter. For an in-depth analysis of the rather complex optimum allocation model employed, see Derek Hum: "Objectives, Design And Data Contents Of The Basic Income Experiment In Manitoba", paper presented at the annual CEA meeting, June, 1977; and "Canada's Administrative Experience With NIT", Canadian Taxation, 1981, (3). See appendix for a complete listing of technical support papers available to users of the MINCOME data set.

⁴⁶ The support guarantee was adjusted above or below these numbers according to a Family Size Index (FSI). For instance, the guarantee level for a single-person household (one adult and no children) was 38 percent of the above values. For the largest family size, the guarantee level could run as high as 247 percent of the stated val-

by a yearly cost-of-living adjustment, these figures became \$4,982, \$6,114 and \$7,246 respectively in January 1977. Taking the three offset tax rates - 35%, 50% and 75% - into account, we get the following nine-cell combination:

	January 1975 Support Levels		
	\$3,800	\$4,800	\$5,800
TAX RATES			
35%	Plan 1	Plan 2	x
50%	Plan 3	Plan 4	Plan 5
75%	Plan 6	Plan 7	Plan 8

*Plan 9 = Control Group

Plan 6 encountered high attrition rates possibly because it was not attractive enough relative to existing welfare programs. As such it was eventually collapsed into Plan 7.

Some of MINCOME's other features were:

1. Stratified random samples were drawn from Winnipeg city and selected rural Manitoba communities. To approximate the condition of universal eligibility, the "saturation" site of Dauphin was added wherein the entire community was declared eligible to partic-

ues.

ipate in the experiment.⁴⁷

2. All government cash transfers received by participants were taxed at 100 percent and income taxes were rebated. This was done to control the participant's marginal tax rate as well as provide a basis of equality.
3. Soon after the experiment was underway, non-participation and attrition surfaced as serious problems. Hence a "supplementary sample" was enrolled from the urban-dispersed site. In all, a total of 293 additional families were enrolled (all intact households), and assigned to various treatment (or control) conditions depending upon where the need was most acute. Because they lagged the main sample by about 12 months, these families continued to receive payments for a year after the termination of payments for the main sample.
4. Enrolled family units participated in nine periodic surveys, administered roughly every four months. They filed monthly Income Report Forms (IRF's) and received payments according to the Payments formula appropriate to their plan. Year-end adjustments

⁴⁷ The inclusion of the saturation site enhanced the policy relevance of the experiment. All the participants involved were subjected to a single plan - Plan 3 - as it makes no sense to have more or less generous plans universally available.

against their actual entitlement were also made.

4.2.1 Basic Sample Characteristics

MINCOME households are quite different from the poverty population as a whole, at times even different from the poor who are eligible for welfare. Several of their characteristics follow directly from the experiment's mode of sample selection. For instance, compared to all of the poor, the MINCOME households are younger because families with either head 57 years of age or more were excluded. Mentally incompetent households, households with a language barrier to answering in English, as well as those with disabled adult members, were also disregarded. Since households with an average 1972/1973 yearly income in excess of \$13 000 were excluded, it was highly unlikely that families with two regular workers would be eligible for inclusion in the sample. Consequently, MINCOME had fewer working wives or other secondary workers than in the general population.

All these reasons (among others) imply that the families interviewed did not comprise a random sample of Manitoba households, but only a substantial number of "low income" households. The sample characteristics relevant to our investigation are summarized below in tabular form.

TABLE 2
BASIC SAMPLE CHARACTERISTICS

CHARACTERISTICS	EXPERIMENTALS		CONTROLS	
	Frequency	%	Frequency	%
<u>MALE HEAD CHARACTERISTICS</u>				
High School Educated	19	3	7	3.2
< High School Education	549	87.1	181	83
> High School Education	62	9.8	30	13.8
Annual Employment				
>= 47 weeks	277	44.0	116	53.2
< 35 weeks	262	41.6	77	35.3
Hourly Wages > Minimum Wage	265	42.1	147	67.4
Hourly Wages < Minimum Wage	365	57.9	71	32.6
<u>FEMALE HEAD CHARACTERISTICS</u>				
High School Educated	27	4.3	10	4.6
< High School	562	89.2	193	88.5
> High School	41	6.5	15	6.9
Part-Time Working Mothers	477	75.7	155	71.1
Full-Time Working Mothers	75	11.9	29	13.3
Wages < Minimum Wage	505	80.2	146	67
Wages > Minimum Wage	125	19.8	72	33
<u>FAMILY SIZE</u>				
Childless Couples	121	19.2	22	10.1
Couples With Children	509	80.8	196	89.9
<u>LENGTH OF MARRIAGE</u>				
Married <= 3 yrs	66	10.5	18	8.3
Married >= 10 yrs	316	50.2	43	19.7
<u>FAMILY INCOME SITUATION</u>				
Below Poverty Level Families	375	59.5	71	32.6
Above Average Income	14	2.2	8	3.7
Home Owners	323	51.3	93	42.7
Liquid Assets < \$2 000	473	75.1	183	83.9
Liquid Assets > \$5 000	43	6.8	16	7.3
Debts <= \$3 000	541	85.9	169	77.5
Debts > \$5 000	35	5.6	17	7.8

The total number of Experimental families were 630, while the Control families numbered 218, for a total sample size of 848. Total family income was arrived at by adding all wage, investment and welfare incomes of every member in each household. A family of four was considered to be below the poverty level if annual income was less than \$6 909. A family of four with total annual income in excess of \$15 450 was considered to be an 'above-average income family'. The debt figures show family indebtedness other than mortgage on the home. As for the other characteristics, they ought to be self-explanatory.

MINCOME ended in 1979 after amassing quantities of data, but before the completion of the intended program of research. Until now, it has provided few results or analyses, only a data base for the present (and perhaps future) research. On a positive note, however, this Manitoba experiment laid to rest the claim that a GAI would be impossible to design and operate. After four years of toil and trial with MINCOME, one can safely say that that a GAI is administratively feasible in Canada, provided that proper attention is devoted to its design (Hum, 1981).

4.3 METHODS OF ANALYSIS

4.3.1 Path Analysis

In the social sciences, the most common approach to data analysis is to use some sort of linear regression analysis.⁴⁸ Our choice in Chapter V is the **Path Model** - a causal inference procedure useful in making explicit the rationale of conventional regression calculations.

Path analysis is based on ideas developed originally in biology (Wright 1934, 1954; Li 1955, 1956) and economics (Wold and Jureen, 1953; Wold 1954). Its popularity probably derives from the potential advantages it offers over conventional multiple regression techniques. The multistage, multivariate path model is written as a recursive system of simultaneous equations, representing the causal processes assumed to operate among all the variables under consideration. Because a recursive system of equations does not allow any endogenous variable in the system at a given point in time, to be considered both a cause and an effect of another endogenous variable in the same system, the path analytic approach is strictly applicable to social processes that are unidirectional. The postulated causal relations among the

⁴⁸ Even some analyses of income maintenance experiments relied on this approach. For instance, Middleton and Haas (1976) regressed a dummy variable indicating whether an union was still intact at the end of the "Rural Experiment"; Henry (1975) used a similar procedure for determining the experimental effects of the Gary experiment.

variables are represented by unidirectional arrows extending from each determining variable to each variable dependent on it. The purpose of the exercise is:

- (a) to isolate the stages of causation; and
- (b) specifying the network of causal paths that exist between the variables and identify the parameters of causation, so that one knows just how much one variable owes to another.

The direct effects are the standardised regression coefficients and the indirect effects are calculated by multiplying the successive path coefficients. One need treat each line of the recursive model as a separate regression problem, in which case the standardised partial regression coefficients are the best estimates of the path coefficients on that line. The assumptions that accompany the use of recursive path analysis include assymetrical causation and unrelated error terms as well as the other conditions that go along with the ordinary least squares criterion.

Path analysis thus amounts to a sequence of conventional regression analyses, and with its basic theorem being merely a compact statement of normal equations of regression theory for variables in standard form, the usual methods for regression calculations may be employed. Implicit in the reporting of standardised coefficients is the assumption that the variance of the underlying population is not changing over time and/or that the variances of the different populations are similar.

To construct a linear, recursive model one must be able to specify which variables are causes and which are effects, and in chains of causation, one must be able to specify the variable that comes first, second, third and so on in the chain. Path analysis thus requires a theory of causal priorities, i.e. the assumed causal sequence of effects must be determined a priori and should be based on theoretical considerations. Obviously, only one ordering of variables is correct for a given system, and only with that ordering will one obtain a model that is valid for explanation and simulation purposes. In other words, the raw materials for a path analysis consist of data and theory, and an analysis cannot be conducted without both. Omission of an important variable will cause the path coefficients to be biased; inclusion of an unimportant variable will bias only the estimates of parameter variance, reducing the sensitivity of tests of statistical significance of the parameters but not affecting the parameter estimates themselves.

4.3.2 The Proportional Hazards Model

In Chapter VI we make use of an alternative statistical technique - the **proportional hazard model** - to investigate variations in the number, timing and sequence of marital splits within a multivariate framework.⁴⁹ This is a statis-

⁴⁹ The hazard model was first introduced by Cox (1972) and

tical method developed largely in industrial engineering where it is often necessary to compute the useful lives of various machines, and in the biomedical sciences to describe events such as the survival times of cancer patients. The most widespread application by economists has been in the area of economic theories of job search, specially in the distribution of the duration of unemployment, geographic or occupational mobility, time between moves etc. MINCOME offers another potential area of application - the determination of the duration of marital spells. In the context of this thesis, the "hazard" approach is particularly appropriate as it emphasises conditional probabilities. In other words, the central place in this statistical technique is occupied not by the unconditional probability of an event taking place (e.g., the probability of a marriage lasting exactly five years), but of its conditional probability (e.g., the probability of a family surviving the fifth year given that it has stayed together for the past four years).

Conditional on the union staying intact through last year, the probability of a split occurring this year is say, λ . The assumption that λ is the same each year, is a very strong one. It is more likely that this conditional probability varies as the length of the marriage increases, per-

has since been improved upon by others. A discussion of its mechanics with applications to demographic analysis is presented elsewhere (see Kalbfleisch and Prentice, 1980, Menken et al., 1981, Martin et al., 1983, Balakrishnan et al., 1987), and so we will not deal with those in any detail here.

haps due to the accumulation of marital specific capital (children), due to a change in either spouses' employment status, family income situation etc. As such the economics of the problem suggests that we reason in terms of the conditional probabilities, not the unconditional probabilities.

Proportional hazard models are sometimes regarded as extensions of the more basic life table methodology. But life tables are limited by the assumption of population homogeneity - i.e. they assume that all individuals have the same conditional probability of an event occurring. This is an untenable assumption because in reality, individuals differ in the rate at which most life course transitions (marriage, divorce, death etc.,) occur. By ignoring this heterogeneity, life tables overlook one crucial fact of life - some units are more likely to make a transition than others.⁵⁰

To some extent this problem may be handled by constructing separate life tables for different subgroups of population with differing characteristics. But when more than two or three variables of interest are involved, this particular approach will lead to small sample size problems because of too many partitions of the data.

⁵⁰ For instance, it is well known that younger couples are more likely to dissolve their unions compared to their counterparts who married at an older age.

Proportional hazard models acknowledge the fact of heterogeneity by allowing the formulation of equations relating independent variables to the hazard function (analogous to conventional least squares regression). The assumption here is that population heterogeneity is captured by the set of covariates included in the analysis.

Proportional hazard models focus on two related functions: the survivor function $S(t)$ and the hazard function $\lambda(t)$. The survivor function gives the probability that a marriage survives at least to time t (or to a marital duration of length t). The hazard function, on the other hand, defines the probability of a marital dissolution occurring at time t , conditional on no split having occurred prior to that time. Knowledge of $S(t)$ and $\lambda(t)$, therefore, yield information on the number, timing and sequencing of major household transition events.

Basically, the hazard model allows the risk to depend not only on time (as is the case with life tables), but also upon the individual's personal characteristics. Specifically, it is assumed, that for an individual "i" with a known set of characteristics represented by a vector of covariates Z_i , the hazard function is given by:

$$\lambda(t) = \lambda_e(t) \exp(\beta \cdot z)$$

where

λ is a column vector of parameters, and
 z is a row vector of covariates.

Hence the hazard function is the product of an underlying duration-dependent risk $\lambda_e(t)$ and another factor $\exp(\beta, z)$ which depends on covariates (e.g., education, income, age etc.,). The factor $\exp(\beta, z)$ is the relative risk associated with having the characteristics Z_i . When there are no covariates present $\exp(\beta, z)$ reduces to unity.

Chapter VI will demonstrate the usefulness of this new statistical technique in economic analysis. On a final note, it may be pointed out that proportional hazard models are becoming almost as easy to use as more standard procedures such as regression. Packages for hazard estimation (e.g., SAS, BMDP) are gradually emerging and soon this approach may prove to be a valuable addition to the economist's tool box of analytical methods.

Chapter V

THE DYNAMICS OF FAMILIAL TRANSITIONS - A MULTISTAGE, MULTIVARIATE, PATH ANALYTIC APPROACH

"There is no effect without a cause," replied Candide modestly. "All things are necessarily connected and arranged for the best" -
Voltaire, CANDIDE

This chapter is concerned with the application of a causal modelling technique - the path analytic method - in the analysis of MINCOME's experimental data. While this unidirectional causal inference procedure has found wide acceptance as a powerful approach to analyse causal relations and correlations in the bulk of the family studies literature, it encounters stiff difficulties when analysing non-experimental data (because there the variables of interest are often causally reciprocal).

When reciprocal causation poses a substantive problem, the analyst is advised to separate the variables temporally, leave the causal connections unspecified or, allow for simultaneous causation between the variables involved. A limitation of the latter approach is that simultaneous reciprocal causal parameters are often underidentified. The problem with leaving causal connections unspecified is that it yields virtually no information regarding causation, except when both reciprocal effects are zero.

One of the virtues of experimental data (such as MINCOME's) is that, it is by design able to circumvent the problem of reciprocal causation. In the ideal experiment, changes in variables are controlled thus giving information on the directions of causal effects, and there is careful measurement of changes which in turn yields information on causal parameters. Since the independent variable, (say X), is ordinarily induced temporally prior to the measurement of the dependent variable, (say Y), the possibility of reciprocal causation can be ruled out and the causal directionality of an association between X and Y can usually be interpreted unambiguously. Hence the motivation to apply the **path causal inference procedure** in the analysis of MINCOME's experimental data.

A second factor influencing the choice of this technique is that in the path analytic approach, the total effect of one variable on another is assumed to be made up of three components: **direct effects, indirect effects, and correlation due to common or spurious causes.** These effects are obtained by differing manipulations of the path coefficients, which are defined to be the standardised regression coefficients or beta weights of ordinary least squares regression. This ability to interpret the correlation of an exogenous and an endogenous variable as the sum of the direct and indirect effects, is certainly not obvious from the typical formulas for the correlation and standardised

partial regression coefficients. The importance of this trait in the interpretation of causal systems such as ours, will become obvious as we incorporate the background (exogenous) factors - e.g., family income, NIT treatments, spousal literacy levels etc., - in a model of marital dissolution, and examine whether such factors contribute more to marital unrest through the mediating or intervening variables (e.g., employment status, net worth levels ...), than they do as direct predictors of marital dissolutions. While all four of the American experiments variously examined the marital stability impacts of the different guarantee levels, they did not explicitly consider how their experimental effects may be significantly reduced in the presence of intervening variables. But as pointed out in the literature survey, there is considerable empirical support for the proposition that the structural coherence of the family can be traced not only to the level of income, but also to the effects of intervening variables such as assets, debt accumulation, literacy levels etc.

The NIT treatments may also affect dissolution indirectly, operating through any of these intervening variables rather than having only a direct effect upon the dependent variable. It is also possible for some independent variables to bypass the intervening variables, thus having primarily direct effects upon the dependent variable.

Hence it is important to specify all the direct and indirect effects of the independent variables upon the dependent and intervening variables - a process referred to as **internal specification**. Our procedure of delineating the important sources and dynamics of influence through all possible direct and indirect paths, could help clear away much of the chaff of armchair theorising, perhaps even clearing the way for a more tolerant acceptance of empirically based principles.

5.1 CHAPTER GOALS

This chapter has three principal goals: first, to set up a path model of marital dissolution; second, to present MIN-COME's marital dissolution results within that path analytic framework; and finally, compare our findings with earlier empirical evidence (experimental and otherwise).

5.2 A PATH MODEL OF MARITAL DISSOLUTION

Given the dual goals of specifying causal paths and identifying causal parameters in structural models, the exogenous (input) variables must be separated from the endogenous and clearly specified as inputs. This is important since input variables have causal priority over all other variables and they are presumed not to be causally related to one another (even though they may be correlated).

TABLE 3
VARIABLES ASSOCIATED WITH MARITAL INSTABILITY.

Variable Name	Description
LMR ¹	Length of marriage
MLEDN ²	Male head education level
FMEDN ³	Female head education level
FAMSIZ ⁴	Family size
MHLSS ⁵	Male head labor supply
FMLSS ⁶	Female head labor supply
T ¹ to T ⁸	Eight treatment levels
LOWPL ⁷	Families on the low plan
MEDPL ⁸	Families on the medium plan
HIGHPL ⁹	Families on the high plan
FAMINC ¹⁰	Family income level
ASSET ¹¹	Family asset level
DEBT ¹²	Family debt level
SPLIT ¹³	Marital split

*Path analysis requires the use of superscripts in order to identify the 'path coefficients' associated with specific variables.

5.2.1 Exogenous Variables

The following exogenous variables are proposed for the model - length of marriage (LMR), male-head's education level (MLEDN), and the eight different treatment levels (T¹ to T⁸). While the variable LMR is self explanatory, MLEDN (the male-head's education variable) was defined as the actual number of years of schooling completed. Dummies were used to represent the treatments (annual guarantee levels and tax rates) assigned to the experimental households at enrollment, and these may be defined as follows:

- T¹ = Annual Guarantee of \$3800 and NIT at 0.35
 T² = Annual Guarantee of \$4800 and NIT at 0.35
 T³ = Annual Guarantee of \$3800 and NIT at 0.5
 T⁴ = Annual Guarantee of \$4800 and NIT at 0.5
 T⁵ = Annual Guarantee of \$5800 and NIT at 0.5
 T⁶ = Annual Guarantee of \$3800 and NIT at 0.75
 T⁷ = Annual Guarantee of \$4800 and NIT at 0.75
 T⁸ = Annual Guarantee of \$5800 and NIT at 0.75

There being a total of nine treatments, (Treatment-IX representing the control group), eight dummies were used. The control group was not represented by a dummy variable and hence this omitted condition formed the basis against which the experimental effects could be compared.

5.2.2 Endogenous Variables

Becker's (1974) optimal marital sorting hypothesis explaining the predominance of positive assortive mating with respect to personal characteristics such as education, age, physical attractiveness, etc., provided the basis for the regression model: $FMEDN = f[MLEDN]$, where FMEDN denotes female head literacy level. Basically, it seeks to test the hypothesis that in an efficient marriage market superior persons tend to marry one another. As Becker points out the mating of likes is optimal as traits are complements or substitutes; superior partners reinforce each other when traits are complements and offset each other when traits are substitutes.

FMEDN, the dependent variable in the first regression model, was included as an intervening variable in the path analysis and as such was active as an independent variable in the other equations of the path model. The other dependent variables that constitute the rest of the intervening entities in our model, are:

- family size (FAMSIZ)
- male head's labor supply (MHLSS)
- female head's labor supply (FMLSS)
- total family income (FAMINC)
- family's asset level (ASSET)
- family's debt level (DEBT)

Total family income is the sum of all wage, investment and welfare incomes of all the members in the household. Asset figures were arrived at by adding up the family's total cash savings, resale value of owned dwelling, all money in insurance policies, pension funds and RRSP, as well as money in bonds and securities.

The debt figures refer to all money owed (except mortgages) plus the principal outstanding on owned dwelling.

Male head labor supply (MHLSS) refers to the number of weeks that the male head had been employed over the course of a full year. This variable was constructed by averaging the total number of weeks that he was employed during the two years - 1973 and 1974.

Female head labor supply (FMLSS) is the same variable, constructed for the female head of the household.

As will be evident shortly, these intervening variables will find use as individual independent variables in a quite a number of the regression equations (e.g. equations ix, x, xi etc.,) in our recursive set-up. The empirical estimates obtained thereby will go to prove or disprove the contention (of Ross and Sawhill among others) that marital instability is more often related to lack of assets, income decreases and debt levels, rather than to the level of income.

A dichotomous variable - **head splits (SPLIT)** - is the ultimate variable of interest in this thesis. Considering the small proportion of reported marital dissolutions during the length of the experiment, as well as the risk of large numbers of non-disclosures, it was felt that any **head-split** (for whatever reported reason), would be an acceptable definition of a familial split. In other words, a marriage was considered stable only if the spouses maintained a common residence over the periods of the subsequent interviews, and unstable otherwise.⁵¹ While such a definition may appear to be too loose, it can nevertheless be justified on the ground that of all the male-heads who split, a very negligible num-

⁵¹ This definition of "splits" does not mean that we are idiosyncratically defining and operationalising our own terms. The **Canadian Family History Survey (1984)** uses a similar definition: "a marriage is considered ended if the couple have legally divorced and also if they have separated from bed and board. This procedure overestimates the extent of marital dissolutions to the extent that some separated couples may be reconciled, but it is thought that most separations eventually lead to divorce (source: Statistics Canada: Nov.1986; p.14). See appendix for more details on the occurrence of splits over the total duration of the experiment.

ber rejoined their families during the duration of the experiment. We therefore adhere to the view that prolonged periods of absence is a sure sign of tensions and dissatisfaction within the household - elements which will in all likelihood contribute to a subsequent dissolution.

5.2.3 The Model

Having selected the relevant variables - both endogenous and exogenous - one then approaches the multistage, multivariate modelling problem with specific ideas about the causal structure involved. We began by formalising our notions by mapping them onto a **path diagram** that we regarded as a heuristic device, until we were satisfied that it represented the causal sequences as suggested by the current state of theoretical and empirical knowledge about the variables of interest. Although not intrinsic to the method, the diagrammatic approach is of great value because by indicating the amount of effect that flows along given paths of causation, it illustrates graphically the extent to which the theoretical model is confirmed. Also the pattern of indirect effects is hardly obvious without the aid of an explicit graphical representation of the causal scheme.

Having mapped the selected variables onto a path diagram representing the rough notions of causation, we then wrote

the following recursive system of equations as the path model (keeping in mind that in recursive systems, the specification problem reduces to one of ordering the relevant variables in terms of their causal priority). It may be reiterated once more, that the model below is only one form of a possible infinity of specific multistage, multivariate path models. Initially, it is formulated in the broadest possible terms, with a trimmer, lean version following soon after.

- (1) $LMR^1 = p_{1a} z^a$
- (2) $MLEDN^2 = p_{2b} z^b$
- (3) $FMEDN^3 = p_{32} MLEDN^2 + p_{4c} z^c$
- (4) $FAMSIZ^4 = p_{41} LMR^1 + p_{42} MLEDN^2 + p_{43} FMEDN^3 + p_{4d} z^d$
- (5) $MHLSS^5 = p_{51} LMR^1 + p_{52} MLEDN^2 + p_{54} FAMSIZ^4 + p_{5t} T^t + p_{5e} z^e$
- (6) $MHLSS^5 = p_{51} LMR^1 + p_{42} MLEDN^2 + p_{54} FAMSIZ^4 + p_{57} LWPL^7 + p_{58} MDPL^8 + p_{59} HGPL^9 + p_{5f} z^f$
- (7) $FMLSS^6 = p_{61} LMR^1 + p_{62} MLEDN^2 + p_{63} FMEDN^3 + p_{64} FAMSIZ^4 + p_{65} MHLSS^5 + p_{6t} T^t + p_{6g} z^g$
- (8) $FMLSS^6 = p_{61} LMR^1 + p_{62} MLEDN^2 + p_{63} FMEDN^3 + p_{64} FAMSIZ^4 + p_{65} MHLSS^5 + p_{67} LWPL^7 + p_{68} MDPL^8 + p_{69} HGPL^9 + p_{6h} z^h$
- (9) $FAMINC^{10} = p_{10,1} LMR^1 + p_{10,2} MLEDN^2 + p_{10,3} FMDN^3 + p_{10,4} FAMSIZ^4 + p_{10,5} MHLSS^5 + p_{10,6} FMLSS^6 + p_{10,i} T^i + p_{10,k} z^k$
- (10) $FAMINC^{10} = p_{10,1} LMR^1 + p_{10,2} MLEDN^2 + p_{10,3} FMDN^3 + p_{10,4} FAMSIZ^4 + p_{10,5} MHLSS^5 + p_{10,6} FMLSS^6 + p_{10,7} LWPL^7 + p_{10,8} MDPL^8 + p_{10,9} HGPL^9 + p_{10,L} z^L$
- (11) $ASSET^{11} = p_{11,1} LMR^1 + p_{11,2} MLEDN^2 + p_{11,3} FMEDN^3 + p_{11,4} FAMSIZ^4 + p_{11,5} MHLSS^5 + p_{11,6} FMLSS^6 + p_{11,10} FAMINC^{10} + p_{11,i} D^i + p_{11,M} z^M$
- (12) $ASSET^{11} = p_{11,1} LMR^1 + p_{11,2} MLEDN^2 + p_{11,3} FMEDN^3 + p_{11,4} FAMSIZ^4 + p_{11,5} MHLSS^5 + p_{11,6} FMLSS^6$

- $$+ P^{11,7} LWPL^7 + P^{11,8} MDPL^8 + P^{11,9} HGPL^9 + P^{11,N} Z^N$$
- (13) $DEBT^{12} = P^{12,1} LMR^1 + P^{12,2} MLEDN^2 + P^{12,3} FMEDN^3$
 $+ P^{12,4} FAMSIZ^4 + P^{12,5} MHLSS^5 + P^{12,6} FMLSS^6$
 $+ P^{12,10} FAMINC^{10} + P^{12,11} ASST^{11} + P^{12,i} T^i + P^{12,p} Z^p$
- (14) $DEBT^{12} = P^{12,1} LMR^1 + P^{12,2} MLEDN^2 + P^{12,3} FMEDN^3$
 $+ P^{12,4} FAMSIZ^4 + P^{12,5} MHLSS^5 + P^{12,6} FMLSS^6$
 $+ P^{12,7} LOWPL^7 + P^{12,8} MEDPL^8 + P^{12,9} HGHPL^9$
 $+ P^{12,10} FAMINC^{10} + P^{12,11} ASSET^{11} + P^{12,Q} Z^Q$
- (15) $SPLIT^{15} = P^{15,1} LMR^1 + P^{15,2} MLEDN^2 + P^{15,3} FMEDN^3$
 $+ P^{15,4} FAMSIZ^4 + P^{15,5} MHLSS^5 + P^{15,6} FLMSS^6$
 $+ P^{15,10} FAMINC^{10} + P^{15,11} ASSET^{11} + P^{15,12} DEBT^{12}$
 $+ P^{15,i} T^i + P^{15,R} Z^R$
- (16) $SPLIT^{15} = P^{15,1} LMR^1 + P^{15,2} MLEDN^2 + P^{15,3} FMEDN^3$
 $+ P^{15,4} FAMSIZ^4 + P^{15,5} MHLSS^5 + P^{15,6} FMLSS^6$
 $+ P^{15,7} LOWPL^7 + P^{15,8} MEDPL^8 + P^{15,9} HGHPL^9$
 $+ P^{15,10} FAMINC^{10} + P^{15,11} ASSET^{11} + P^{15,12} DEBT^{12}$
 $+ P^{15,s} Z^s$

In the model above, variations in the exogenous variables has effects - direct and indirect - on the rest of the variables in the system. Given the recursive nature of the model, the direction of the effects is always outward or centrifugal - away from the central input variables. The parameters of the model are called **path coefficients** when the variables are in standardised form; the parameters are called **path regression coefficients** when the original measurement units are used. The symbolic form of the path coefficient may be given the form $P^{1'2}$ where the first superscript '1' denotes the dependent variable and the second superscript '2' denotes the variable whose determining influence is under consideration. (The usual practise however, is to use subscripts instead of superscripts). The

residual variables (Z_a, Z_b, Z_c, \dots) represent variables which are outside of the system and a direct estimate⁵² for the residual path coefficients is not available. Therefore, they must be estimated indirectly by utilising the path analysis assumption that the total variation of the endogenous variable is completely determined by a linear combination of the exogenous and residual variables.

5.3 THE GENERAL CALCULUS OF INDIRECT EFFECTS

A major contribution of path analysis is that it provides a general procedure for exploring the indirect effects of a determining variable on a dependent variable. To illustrate: consider a multivariate model made up of three variables - Z^1, Z^2 and Z^3 . If Z^3 is the dependent variable, then the path coefficient P^{31} estimates the direct effect of Z^1 on Z^3 . In general however, the exogenous variable Z^1 will not vary independently of the other exogenous variable Z^2 and their covariation is estimated by the correlation coefficient r^{12} . The total change in Z^3 must therefore take into account not only the direct effect (P^{31}), but also the indirect effects emanating mainly from Z^2 . The latter - often referred to as a **compound path coefficient** - is the product of the covariation of Z^1 and Z^2 (i.e. r^{12}) and the direct effect of a change in Z^2 on Z^3 (which is P^{32}).

⁵² The residual variables are just error terms in the usual econometric sense.

In formal terms, the expression may be written as thus:

$$r^{31} = r^{12} p^{32}$$

That is, the total effect of the exogenous variable (Z^1) on the dependent variable (Z^3) is the sum of the direct and indirect effects. The direct effect operates via the path coefficient from Z^1 to Z^3 (i.e. P^{31}). The indirect effect is measured by $r^{12} P^{32}$ i.e. as the product of the correlation coefficient of the two exogenous variables (r^{12}) and the path coefficient of the second exogenous variable (P^{32}). This implies that the total indirect effect (TIE) of Z^1 and Z^3 may be expressed as the difference: ($r^{31} - P^{31}$).

All this goes to demonstrate that the total effect of an exogenous variable on its endogenous counterpart, is in actuality the aggregate effect emanating from all possible direct and indirect sources. The true contribution of this kind of interpretation of causal systems will become more obvious as the path models get increasingly complex.

5.4 RESULTS AND DISCUSSION

It is customary to begin the discussion with a tabular presentation of the standardised and unstandardised parameter estimates of the full model. But considering the large size of the model at hand and the volume of its generated

estimates, we decided (for reasons of economy in the exposition), to be selective. Thus we provide only estimates of what we consider the relatively more important equations - Equations (15) and (16) - in tabular form below. The difference between these otherwise equivalent equations is that, in the case of Equation (15) we consider all eight treatment plans while in the case of Equation (16), the treatments are grouped into three categories - plans of

TABLE 4
STANDARDISED & UNSTANDARDISED PATH ESTIMATES (EQ.15)

Dependent Variables & Predictors	Standardised Parameter Estimate	Unstandardised Parameter Estimate	p Level	F Value
Head Split				1.657
Intercept	0	0.188	0.018	
LMR	-0.016	-0	0.721	
Family Size	-0.069	-0.012	0.149	
Debt Level	0.102	0	0.023	
Asset Level	-0.065	-0	0.154	
Agg. Family Income	0.046	0	0.321	
Wife's Education	-0.059	-0.006	0.295	
Husband's Educatn.	0.041	0.003	0.481	
MHLSS	-0.089	-0.001	0.06	
FMLSS	0.092	0.001	0.04	
T1	0.009	0.011	0.843	
T2	-0.049	-0.056	0.288	
T3	-0.049	-0.049	0.303	
T4	0.06	0.056	0.213	
T5	-0.051	-0.058	0.278	
T6	-0.047	-0.053	0.324	
T7	-0.039	-0.057	0.398	
T8	0.025	0.028	0.598	

(R-Square = 0.0548)

"low", "medium" and "high" levels of generosity.

The small R-square, the general lack of statistical significance and the small magnitude of the responses is certainly disappointing. But Robert Solow (1986:219) contends that in social experimentation, statistically significant response coefficients are hard to come by. He argues:

No doubt it reflects both the inherent variability of each individual's behavior and the variation among individuals in their average response, which simply cannot be related to observed and observable characteristics...This is hardly surprising...If sharp responses were to be expected we would already know about them; nobody spends millions of dollars to verify the obvious.

In retrospect, the results obtained may not be all that surprising. If one accepts the fact that couples marry for many non-economic reasons, it is not inconsistent that a large proportion of unions that dissolve should have similarly noneconomic motivations.⁵³ In the context of our thesis, however, the most heartening aspect of the above results is that, they support most of the hypothesised relations between the predictor variables and marital instability. To illustrate:

1. The **family debt level** is positively associated with marital instability and it is statistically significant as well.⁵⁴ This makes intuitive sense since

⁵³ "Non-economic" motivations are not necessarily "non-optimizing". They simply refer to non-monetary variables of a psychological and/or emotional nature - e.g., love, physical appearance, family name, etc.

⁵⁴ Similarly, Mott and Moore (1979) utilising data from the National Longitudinal Survey of labor market behavior of young women, found that among white American families, having no accumulated debts was associated with lower

greater debt burdens put strains on the union, creating tensions and dissatisfactions that contribute to a subsequent dissolution.

2. The **family size** variable (FAMSIZ) induced a negative parameter estimate. This too was in the predicted direction because a larger family - one with more children under one roof - has engaged in what Becker calls the **accumulation of marital specific capital**. Since such an investment is invariably less valuable in the event of a split, (one parent always having less contact with the children after the divorce), large family size acts as a deterrent to dissolutions.⁵⁵ Other studies (Bumpass and Sweet, 1972) have also found that the presence of children have a stabilising influence, although Cherlin (1977) contends that the stabilising influence lasts only until the children are of pre-school age. Similarly, in the SIME-DIME experiment Groeneveld et al., (1983) observed that the NIT treatment increased the disso-

levels of marital disruption.

⁵⁵ A larger family size could also be the result of many relatives (e.g., brothers, sisters, grand parents etc.,) living under one common roof. Some sociologists explain the greater stability in such situations by citing Goode's (1960) model of family connectedness. The unmanageable volume of demands (that invariably accompany larger membership), can be better met through the large network of diverse roles which individual members are capable of performing. The family thus becomes a giant network of interlocking role sets, answering to the varied concerns of its various members. It is this concern for the unit in its entirety that makes these families more stable.

lution rate much more among white childless couples than among white couples with children. When childlessness was interacted with the NIT treatment variable, the coefficient of the treatment term was positive but not significant; the coefficient of the interaction term was positive and significant.

3. **The treatment effects:** none of the treatment effects were statistically significant, nor did the variation in split rates across plans follow any systematic trend. Perhaps it would be improper to attach much significance to this finding because rather than the money guarantee, it could be the **break-even level of income** that is of critical importance in any NIT plan. We will investigate shortly whether the MINCOME results do show some systematic trend in the treatment effects when the plans are ranked according to their break even levels, or when other intervening variables are interacted with the NIT treatment variables.

One of the more interesting revelations of Table 4 is that it supports two popular hypothesised relationships of Chapter III:

the wife's labor force participation (FMLSS) is positively related to marital instability, whereas, for the male head the analogous variable (MHLSS) serves to stabilise the union.

FMLSS produced a (statistically significant) positive parameter estimate - proof that as wives gain economic independence over their husbands, the chances that they will cling on to unsatisfying marriages becomes increasingly slim. Becker explains this result by arguing that females who earn more have less to gain from marriage because higher earnings reduce the demand for children and the advantages of the sexual division of labor in marriage (1981; Chapters 2, 4 and 5). As such, women with higher earnings are more prone to divorce - a conclusion supported by several other studies.⁵⁶ Indeed, growth in the earnings of women during the last 30 years is often cited as the principal factor behind the growth in divorce rates during the same period.

Efforts expended by the male head in the labor market (MHLSS) showed the hypothesised negative relationship with head splits, producing a parameter estimate significant at the 10 percent level. This result for husbands reflects the importance that society attaches to their traditional role of provider. The finding may also imply that, despite the fact that women are entering the labor force in increasing

⁵⁶ Cherlin (1976) attempted to test this hypothesis directly and her results proved to be consistent with the Becker model. Nye (1961) in a study of mothers, married at least six years and with one or more children, found that marriages of employed mothers were more likely to be characterised by conflict. He found a "higher" proportion of non-employed mothers with "good" marital adjustment. Likewise, Gover (1963) demonstrated the tendency for non-employed wives (compared to working wives), to have on the average, higher marital adjustment scores. He further noted that this difference was larger in the upper socio-economic groups.

numbers, men (and society) generally expect themselves to be the prime breadwinner. It is through his earning capacity that the husband receives a major portion of his affirmation of success in life and vindicates his dominant position and existence.⁵⁷

5.5 MODEL TRIMMING AND CAUSAL INFERENCE

Having estimated our full-blown recursive system, the next stage in the analysis is to trim the model down to a more parsimonious version so that fewer causal linkages are postulated than in the unrestricted system. This operation involves deleting causal linkages associated with certain variables and in the performance of this task researchers have typically relied upon a test of statistical significance of each regression coefficient, usually at the 0.05 level of significance. We will not adhere to this rule because it is often useful to retain theoretically important variables even if their regression coefficient is insignificant. Some important explanatory variable may not achieve statistical significance, but we feel they should still be included if only to confirm that expectation. As such our

⁵⁷ In the sociological literature this is called the **Parsons-Bales-Zeleditch** formulation of the "expressive" female role and the "instrumental" male role. This view has however come under attack from sociologists of the women's liberation movement, who charge that it reflects "sexist" philosophy of the most objectionable type.

trimmer version will simply replace the eight treatment plans with their breakeven versions - plans of "low", "medium" and "high" levels of generosity.⁵⁸

The table below shows the standardised and unstandardised parameter values of Equations (16) as the model's trimmed down version.

The deletion of the original treatment plans affected the R-square only minimally. The parameter estimates emanating from the three plan levels are still statistically insignificant. Only the middle level plan (MEDPL) exerted a destabilising influence. Both LOWPL and HIGHPL contributed more to the stability of experimental families vis-a-vis the controls. This finding is similar to the New Jersey results

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PLAN LEVEL	BREAKEVEN POINT (in \$)	GUARANTEE LEVEL	TAX RATE
Low	5066.67	3800	.75
	6400.00	4800	.75
Medium	7600.00	3800	.35
	7733.33	5800	.75
	9600.00	4800	.50
High	10,857.00	3800	.35
	11,600.00	5800	.50
	13,714.00	4800	.35

This compression of all the different treatment plans into only three levels of generosity, is not without reason. One of the disadvantages of retaining all eight treatment levels is that we will end up with a much

TABLE 5
PARAMETER ESTIMATES FOR THE TRIMMER MODEL

Dependent Variables And Predictors	Standardised Parameter Estimates	Unstandardised Parameter Estimates	p Level	F Value
Head Split				1.963
Intercept	0	0.183	0.021	
LMR	-0.007	-0	0.861	
FAMSIZ	-0.073	-0.013	0.125	
Family Income	0.042	0	0.364	
MLEDN	0.044	0.003	0.449	
FMEDN	-0.062	-0.006	0.262	
MHLSS	-0.074	-0.001	0.112	
FMLSS	0.089	0.001	0.049	
ASSETS	-0.064	-0	0.16	
DEBTS	0.1	0	0.025	
LOW PLAN	-0.058	-0.054	0.231	
MED PLAN	0.019	0.013	0.695	
HIGH PLAN	-0.051	-0.037	0.304	

(R-Square 0.0458)

which also show that families on "medium" generosity plans had higher transition rates as compared to those on "low" and "high" level plans.

Groeneveld, Hannan and Tuma, on the other hand, found that the NIT plans tested in SIME-DIME dramatically increased dissolution rates - the least generous plan being the most destabilising (increasing dissolution rates by 58 percent for blacks and by 51 percent for whites). But as in MINCOME, the SIME-DIME results concluded that the most gen-

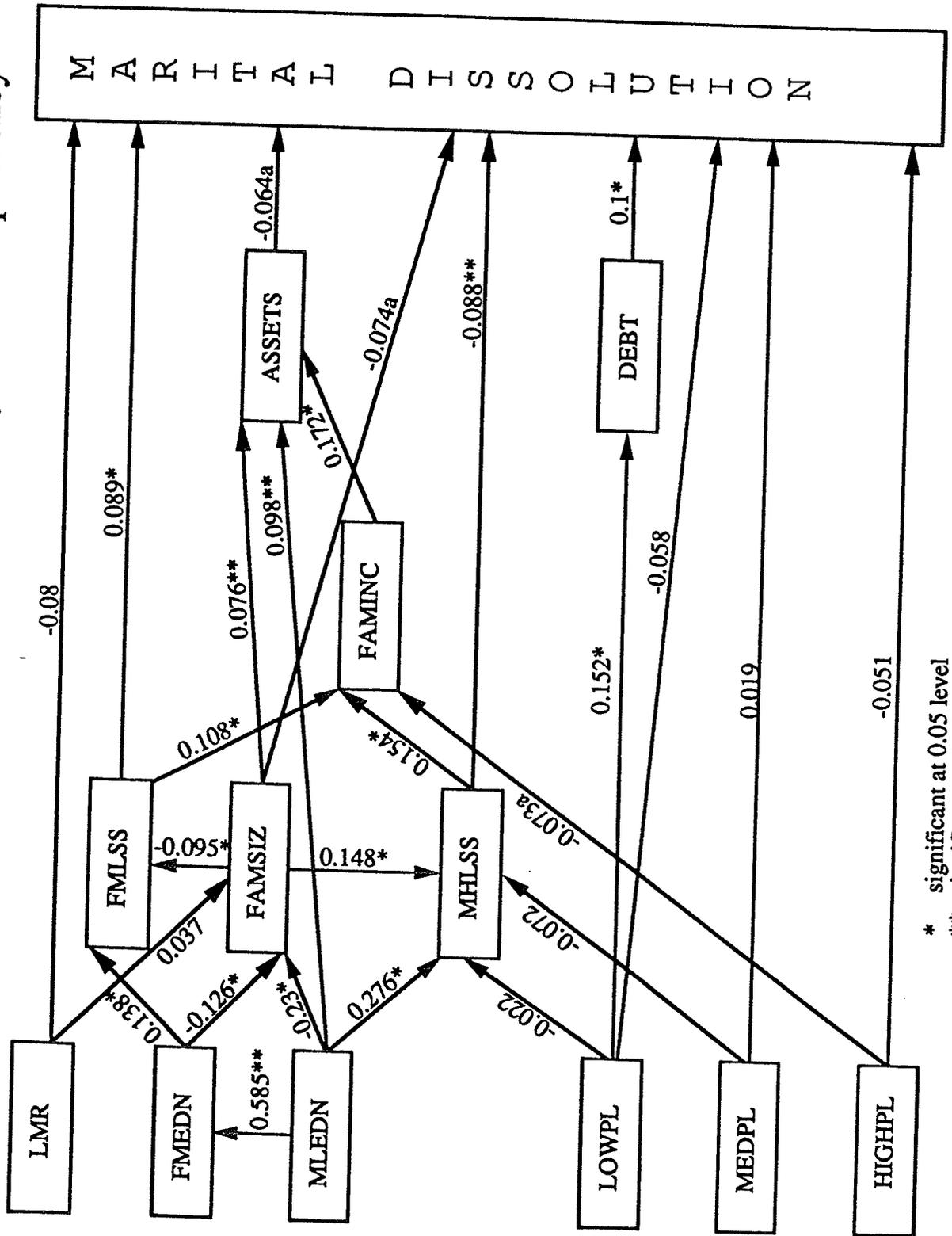
diminished sample size in each category. The consequent problem of 'small sample size' is particularly relevant in our situation, as the outcome of interest - separation or divorce - is a relatively rare event.

erous plan had essentially no destabilising impact.

The other explanatory variables (while confirming most of the hypothesised relations elaborated on earlier), often turned out to be only weak, **direct predictors** of marital splits. This revelation lends some credence to the alternative hypothesis that perhaps many among these variables contribute more to marital instability **indirectly**, through a maze of other mediating variables, than they do as **direct predictors**. Hence the **path diagram** (obtained from the reduced version of the model) is reproduced below, to explore that possibility.

FIGURE - II

Representation Of The Sequences Of One-way Causal Dependency



* significant at 0.05 level
 ** significant at 0.10 level
 a almost significant at 0.10 level

5.5.1 Findings From The Trimmer Version

The dynamics of influence emerging from the configuration has interesting theoretical implications.

1. The male-head's education level (MLEDN) is an excellent predictor of the wife's literacy level ($B=0.585$, $p<.01$). The result indicates that in 50 percent of the cases, a highly educated male will marry a comparably literate female. This evidence of positive correlation between education levels of spouses appears to validate Becker's **positive assortive mating hypothesis**. As discussed in Chapter III, this hypothesis contends that higher-quality men and women marry each other rather than selecting lower quality mates, irrespective of whether their individual traits are substitutes or complements to each other; a superior wife raises the productivity of a superior spouse and vice versa when the traits are complements and offset each other when they are substitutes.
2. Hypothesis II (Chapter III), states that unemployment among male heads and / or stable employment of female heads are invariably the cause of major disruptions in family life. The MINCOME results validate this hypothesis since two intervening variables - male head labor supply (MHLSS) and female head labor supply (FMLSS) - show opposing (statistically significant) effects on marital instability. Theoretically,

a negative sign for MHLSS and a positive sign for FMLSS was expected and obtained.

3. The negative paths leading from the treatment plans of low and medium levels of generosity (LOWPL and MEDPL) to the male head's work effort (MHLSS), has a variety of explanations.

Those who fear the worst of a guaranteed income scheme will view this as validating their worst nightmares - i.e., the NIT payments are being wasted in the form of increased leisure time. People espousing such a view are the same ones that over-emphasise the "moral hazards" of existing welfare programs (alluded to in Chapters I and II). They argue that a program of unconditional NIT payments should be avoided to protect potential recipients from their own folly (e.g., voluntary work withdrawal) and more importantly, to prevent the wastage of public funds for such purposes.

Alternatively, the negative coefficients may be interpreted in two other ways:

(a) MINCOME's treatment plans may have given their recipients the confidence that they could go into **voluntary unemployment** and thus risk searching for better jobs. In fact, statistics show that in Canada there is a substantial amount of searching by the

"employed". In March, 1979, for instance, 342,000 employed Canadians were looking for another job, as compared to 900,000 unemployed searchers (Statistics Canada, 71-001, 35, 3, Tables 29-39). This is not surprising because Martin Fieldstein (1976, 1975 and elsewhere) has repeatedly stressed that there is much search without unemployment and much unemployment without search.

(b) It is also possible that being on a plan encourages families to increase the number of children (since payment levels are positively related to family size). Given this increased investment in marital specific capital (children), some adults are then obliged to take time off from the work force - implying that MINCOME ended up reducing the relative cost of such "non-market" work.

4. Education appears to stimulate the female-head's labor supply (FMLSS) and this may be attributed to two factors: (a) a higher literacy level raises her potential wage rate which in turn acts as an inducement to work; and (b) it instills in her a "taste for work". This accounts for the positive (and statistically significant) regression coefficient in our path configuration.
5. While family income (FAMINC) was not a factor affecting marital stability, both asset and debt levels as

well as the male parent's employment status exert statistically significant influences. This MINCOME result echoes the Michigan PSID conclusion that marital instability is related to debt levels, lack of assets and unemployment, rather than to the level of family income (Ross and Sawhill, 1975).

6. As noted earlier, the calculations for FAMSIZ ($B = -0.074$, $p < .1$), validates Becker's **marital-specific capital theory** that increasing family size is associated with a decreased risk of marital breakdown. This same path coefficient (FAMSIZ) also validates our modification of the Becker hypothesis, suggested in Chapter III. Our extension of the Becker theory took into account the possibility that the effects of family size may have been obscured by the confounding influence of the length of marriage. After all, it can not be denied that family size and length of marriage are correlated factors i.e., as the length of marriage increases, family size tends to increase upto to some point; at the same time however, increasing length of marriage is associated with decreased risks of breakdown. One reason for the latter (as cited in Chapter III), is the accumulation of **better information** about spousal traits after marriage. Information on disruptive elements like "difficult" spouses, value conflicts etc., is easily acquired within the first few years of marriage and

this is frequently responsible for the quick termination of unions. (To cite U.S. Department of Health, Education and Welfare statistics, 1979, 40 percent of all dissolutions occur prior to the fifth year of marriage). Thus marriages that survive the early years, have done so not by chance but in the aftermath of the accumulation of better information about the compatibility of spouses. This validates Hypothesis IV (Chapter III), which states that the accumulation of children by these families is really a function of their tested compatibility; as such offsprings can at most only reinforce the already strong bonds characterising their parent's union.

5.6 THE CALCULUS OF INDIRECT EFFECTS

We will now investigate how forces generating head splits are transmitted *indirectly* via the intervening variables. This will naturally involve specific discussion of the several **compound** paths representing the indirect connections allowed by our one-way path diagram. The intervening variables selected for the purpose were MHLSS, FMLSS, ASSET and DEBT - all statistically significant predictors of familial stability.

As far as supplementing information already obtained, the table's contribution is only marginal. What is obvious how-

TABLE 6

TREATMENT EFFECTS ON MARITAL INSTABILITY AS TRANSMITTED VIA
SELECTED INTERVENING VARIABLES.

Treatments	Marital Instability Impacts Transmitted Via			
	MHLSS	FMLSS	ASSET	DEBT
LOWPL	-0.003	0.002	-0.004	0.011
MEDPL	0.012	-0.0005	0.002	-0.001
HIGHPL	-0.006	0.001	0.003	-0.003

ever, is the fact that the rank order of the three plans - LOWPL, MEDPL and HIGHPL - evaluated on the basis of the size of their indirect effects, often differs from their rank order when only the direct effects are taken into account. The treatment effects transmitted via most of the intervening variables are not only negligible, but erratic as well. As such they may be ignored. It is only the treatment-effects transpiring through MHLSS and FMLSS that have the most interesting implications. The latter has for the first time uncovered some kind of a definite pattern in the effects wrought by the treatments on the experimental households.

For instance, LOWPL and HIGHPL treatments both reveal a stabilising influence on the union when operating via MHLSS. The theoretical basis for this finding would be that treatments with the "highest" and "lowest" break-even incomes,

when coupled with greater work effort on the part of the male heads, serve to strengthen the 'stabilising' influence of the income effect. Such a result is noteworthy as it further vindicates the popular belief that prolonged periods of male head unemployment undermines his traditional "bread earner" role. He thus feels 'dispensable', his wife knows he is dispensable and soon even the children can sense it too.

With LOWPL and HIGHPL operating via FMLSS, theoretically the opposite sign was expected and obtained. This means that when these same experimental plans are interacted with female head employment, they so strongly reinforce the **independence effect** that the net effect on marital unity is a destabilising one. The reason: steady female head employment enhances the mother's role and obviates the man's. That is, by making optional the **male provider** role, the working wife exerts an erosive pressure on her marriage.

The policy implication of these results is that, any macroeconomic or structural policy targetting unemployment reductions among male heads will produce specially large payoffs in the form of reduced marital instability.

5.7 CONCLUSION

The findings in this chapter go to show how MINCOME households responded to NIT treatments and in the process sometimes disintegrated into single-parent and other non-nuclear living arrangements. While we found path analysis to be a useful method for exploring the interactions between selected subsets of intervening variables, it is still inadequate for a fuller understanding of the social change process. The path technique is primarily suited to the examination of time-constant data; it is in actuality a method designed more for the study of structure rather than process, and as such is an inappropriate methodological tool given the dynamic, processual nature of separation and divorce.

The chapter to follow will seek to remedy this deficiency by employing the Proportional Hazards model when testing hypothesis about causal effects. This alternative technique is particularly suited for analysing MINCOME's experimental data as it is capable of demonstrating the simultaneity of number, timing and sequencing of demographic events such as separation and divorce, within a temporal framework.

Chapter VI

THE MINCOME EXPERIENCE IN MARITAL DISRUPTION - INFERENCES FROM A DYNAMIC MODEL OF DURATION DEPENDENCE

The aim of this chapter is to transform the static perspective of Chapter V into a dynamic one, by focusing on the fluidity of household arrangements, the transition events, their rates and their differentials. The various risk factors that predispose marriages to break down will be modelled using the **Proportional Hazards Model** - a data analytic technique specifically designed for modelling social processes. The goal is two-fold:

1. To document familial transition patterns in three dimensions - number, timing and sequencing. Number refers to the proportion of families experiencing a split; timing refers to the rate at which splits occur and sequencing refers to the ordering of the event with respect to some other event
2. To construct a **Proportional Hazards Model** incorporating the various risk factors descriptive of patterns of family formation and dissolution. The objective here is to determine the correlates of marital splits, by looking at duration-specific probabilities of dissolution for the two familial groups - experi-

mentals and controls - and applying the hazard model to estimate their relative dissolution risks.

Divorces are increasing in Canada, on average, by over 3000 a year. In 1975, the Canadian divorce rate was recorded as 200 per 100,000 population and rapidly heading towards the US rate of 300 per 100,000. Between 1981 and 1986, the currently divorced population increased by 38.1 percent - from 500,135 to a staggering 690,490. The numbers in the separated category rose from 470,455 (in 1981) to 517,530 by 1986 - an increase of approximately 10 percent.⁵⁹

This active level of transitions in and out of households is a cue to the impressive fluidity of familial ties in Canada. Path Analysis, while useful and constituting an important first step, cannot explain the full range of this fluidity - i.e. describe the trajectory of change in an individual's marital status, within a multivariate setting. What is required therefore, is a dynamic statistical model capable of examining the full variety of household types from which the individuals may choose, the transitions among these arrangements and how long individuals spend in a given household type. In other words, marital disruptions ought to be viewed both as a process as well as an event, and within such a context, our choice of the **Hazard Model** for mapping out the dynamics of this process appears justified.

⁵⁹ Source: Statistics Canada: 1986 Census Of Canada.

6.1 CHOICE OF VARIABLES

Based on our literature review (Chapter II), our theoretical framework for analysing issues in marital instability (Chapter III) and our causal inference model of Chapter V, we first compiled a list of all possible demographic, economic and social variables that might be useful in decomposing the transition probability of households. But as the conglomeration of variables multiplied endlessly, we stopped to review earlier findings with perspective and in the process deleted variables having no immediate policy interest, as well as those which would not be susceptible to control and manipulation in the operational context of a hazard model. The variables then remaining were further scrutinised and reduced to the fairly stable and consistent set identified in Table 7.

While not intended to be exhaustive, the variables chosen are nevertheless representative of those examined in earlier works. This will facilitate easy comparison of our findings with existing empirical evidence.

In accordance with the logic of hazard analysis, Table 6 consists of variables measured prior to the occurrence of the first transition state. To extrapolate the experimental effects, families are classified as no plan (i.e., the control families), and plans of either low, medium or high lev-

TABLE 7

RISK FACTORS ASSOCIATED WITH RATES OF MARITAL BREAKDOWN

Variable Name	Description
LMR-3	1 if length of marriage is \leq 3 yrs 0 otherwise
LMR-10	1 if length of marriage is \geq 10 yrs 0 otherwise
CC	1 if couple is childless 0 otherwise
FWC	1 for families with children 0 otherwise
<u>Male-head Characteristics</u>	
YREMP	1 if employed year-round (\geq 47 wks) 0 otherwise
TREMP	1 if employed 34-46 wks. 0 otherwise
PREMP	1 if work record poor ($<$ 30 wks) 0 otherwise
MINWGE	1 if minimum wage earner 0 otherwise
HWGE	1 if wages in excess of min. wage 0 otherwise
LHSE	1 if $<$ than High School education 0 otherwise
HSE	1 if completed High School 0 otherwise
MHSE	1 if $>$ than High School education 0 otherwise
<u>Female-head Characteristics</u>	
FLHE	1 if $<$ than High School education 0 otherwise
FHE	1 if completed High School 0 otherwise
FGHE	1 if $>$ than High School education 0 otherwise
FTWM	1 fulltime working mom (\geq 47 wks) 0 otherwise
PTWM	1 if working part-time ($<$ 30 wks) 0 otherwise
NWM	1 if not working 0 otherwise

FMLE	1 if minimum wage earner
	0 otherwise
HWEF	1 if hourly wages > min. wage
	0 otherwise

Family Income Characteristics

BPLF	1 if below poverty-level family
	0 otherwise
AVGYF	1 if average income family
	0 otherwise
ABAVGYF	1 if above average-income family
	0 otherwise
LA2000	1 if liquid assets <= \$2000
	0 otherwise
LA5000	1 if liquid assets > \$5000
	0 otherwise
LAINF	1 if liquid assets \$2000-\$5000
	0 otherwise
DA3000	1 if durable assets <= \$3000
	0 otherwise
DA5000	1 if durable assets > \$5000
	0 otherwise
DAINF	1 if durable assets \$3000-\$5000
	0 otherwise

Location & Other Characteristics

RURFAM	1 if a rural family
	0 otherwise
URFAM	1 if urban family
	0 otherwise
EXPTL	1 if on NIT experiments
	0 otherwise
CTRL	1 if a control family
	0 otherwise

NIT Plan Types

LOWPL	1 if family on low plan
	0 otherwise
MEDPL	1 if on medium plan
	0 otherwise
HIGHPL	1 if on high plan
	0 otherwise

** Low-income cutoffs of family units (size 4) :

Urban Winnipeg : \$6909

Rural Dauphin : \$5527

(Source: Statistics Canada, 1974. "Income Distribution By Size In Canada", Consumer Income And Expenditure Division).

els of generosity. As in the preceding chapter, generosity was determined by ordering plans by their breakeven point.

As in Chapter V, only married intact couples are considered.⁶⁰ Once again, the date of marital dissolution is defined for the purpose of this thesis as the date when the couples stop living together. In other words, we concentrate on the physical breakdown of the union rather than its legal disruption. Of course this definition has the drawback that not all breakdowns will be permanent, and if so, it could lead to an overestimation of final dissolutions. In reality though, the bias is small because the actual number of MINCOME reconciliations were few and far between.⁶¹ Also the definition used here is consistent with a number of previous works.⁶²

⁶⁰ Cain (1987:68) points out that this could bias the marital stability/ instability impacts of an NIT experiment. Say, for instance, the population is composed of (among others) one group of unmarried women that is planning on getting married, but is investing more time in searching for the ideal mate. If the NIT experiment encourages this group to search longer, we might expect fewer divorces among them than on the average. Consequently, the full impact on divorces may be overstated when we are using only already married couples in the experiment.

⁶¹ Of the 89 families that experienced a male-head split during the study period, in only 6 cases had the parents been reunited and remained so until the end of the experiment.

⁶² Menken et al., 1981; Fergusson et al., 1984; Balakrishnan et al., 1987.

6.2 THE EXPERIMENTAL EVIDENCE

In this section we present the results from a series of analyses, explicitly mapping the distribution of the timing of marital splits rather than merely its occurrence over the experiment's lifetime. As a first attempt we will illustrate the time-dependent differences between experimental and control families using the Product-Limit (Kaplan-Meier) method.

The Product-Limit estimate is a powerful nonparametric method for estimating empirical survivor functions and their standard errors even in situations where couples drop out in the middle of the experiment ; i.e., even when the sampled families differ in the length of their exposure to the dissolution risks.⁶³ In the context of our experiment, the survivor function estimates the probability that a family stays intact (i.e. survives) beyond survey t_j , given survival just prior to t_j .

Table 8 describes the distribution of survival times of the experimental families vis-avis the controls over the duration of the experiment. When duration in the experiment

⁶³ Such differences are not to be lightly dismissed. For instance, couples in the control group are more likely to drop out than those on the NIT plans. Ignoring such differences will generally distort inferences because more attrition on the part of the control group could yield a spuriously lower incidence of dissolutions.

TABLE 8
PRODUCT LIMIT SURVIVAL ESTIMATES

Experimental Families				Control Families			
t_j	n_j	$\hat{S}(t_j+0)$	Standard Error	t_j	n_j	$\hat{S}(t_j+0)$	Standard Error
0	218	1.0000	0.0000	0	630	1.0000	0.0000
2	215	0.9862	0.0079	2	620	0.9841	0.005
3	188	0.9759	0.0107	3	535	0.9714	0.0069
4	177	0.9704	0.0120	4	478	0.9544	0.0088
5	166	0.9531	0.0153	5	449	0.9367	0.0106
6	154	0.9232	0.0199	6	434	0.9281	0.0113
7	143	0.9104	0.0215	7	415	0.9192	0.0121
8	138	0.9039	0.0224	8	400	0.9101	0.0128
9	135	0.8972	0.0232	9	393	0.9055	0.0131
10	128	0.8903	0.0240	10	382	0.8915	0.0141
11	123	0.8691	0.0264	11	367	0.8702	0.0155

* The Product-Limit estimate $S(t)$, is defined as

$$\hat{S}(t) = \prod_{j: t_j < t} (n_j - d_j) / n_j$$

Where

n_j = number of couples at risk at t_j ; i.e., the number of couples intact and uncensored just prior to t_j .

t_j = the different surveys at which splits occurred. The possibility of there being more than one split at t_j is allowed.

d_j = number of dissolutions at t_j .

is zero, the survival estimate equals unity. As time spent in the experiment increases, the survivor function tends to fall - i.e., the chances of a dissolution occurring begin to rise.

It is interesting to note that 'time-variation' in the survival probabilities of the sampled families is particu-

larly noticeable around the middle of the experiment - specifically at surveys IV and V. Over this time duration, families on the NIT plans exhibited a higher survival rate as compared to the controls. This could imply that once the participants had become fully familiar with the plans and the generosity levels they represented, the experiment had taken full effect and its stabilising influences started to outweigh forces that were destabilising.⁶⁴ In the final stages of the experiment there appears to be no noticeable difference between the two familial groups - an indication perhaps that as the experiment's termination date loomed closer, its stabilising influences slowly weakened and eventually subsided.

The small experimental-control differences should not be overemphasised. One important reason is the fact that the estimates overleaf, are primarily **period estimates**. It is common demographic wisdom that period estimates may overstate (or understate) actual cohort experience because of either **timing shifts** or **changing rates**. They will be **inflated** to the extent that divorce is occurring progressively earlier in marriage and they will be **understated** when "timing" ceases to change. As such, it is perhaps prudent to evaluate the experimental-control differences in the light of a longer trend. After all, "period" variations can also

⁶⁴ Even in the four American experiments, initially the participants did not fully understand how their benefits, payments, eligibility conditions etc., were calculated and determined. Considerable time and effort had to be expended to explain to them how the system worked.

be associated with economic or even attitudinal fluctuations.

6.3 TESTS OF EQUALITY OVER STRATA

The next question to explore is, whether or not the difference in survival distribution between the two familial groups is statistically significant. In other words, is the difference shown by the data significant or simply random variation in the sample? A statistical test of significance is needed. However, a statistical test without considering the familial characteristics makes sense only if the two family types are homogeneous with respect to prognostic factors. It has been assumed thus far that the families in the two groups are comparable and that the only difference between them is in their exposure (or non-exposure) to the treatments.

The commonly used test statistics that attempt to summarise the differences between survivor function estimates, are the **Wilcoxon test** and the **Logrank (or Savage) test** of homogeneity over strata. These tests are analogues of nonparametric rank tests and they differ only in the way the observations are weighted. The Wilcoxon test gives greater weight to earlier events and is less sensitive to later ones; the logrank test places more weight on larger survival times. However both tests are valid in large samples whether the censoring patterns are equal or unequal.

In testing the significance of the difference between the two survival distributions, the hypothesis is that the survival distribution of the experimental families is the same as that of the controls. Let $S_1(t)$ and $S_2(t)$ be the survival functions of the experimentals and controls respectively. The null hypothesis is then

$$H_0: S_1(t) = S_2(t).$$

The alternative hypothesis is

$$H_A: S_1(t) \neq S_2(t).$$

TABLE 9
TEST(A) OF EQUALITY OVER STRATA

TEST	CHI-SQUARE	DF	P-VALUE
Logrank	0.00638	1	0.9363
Wilcoxon	0.0185	1	0.8917

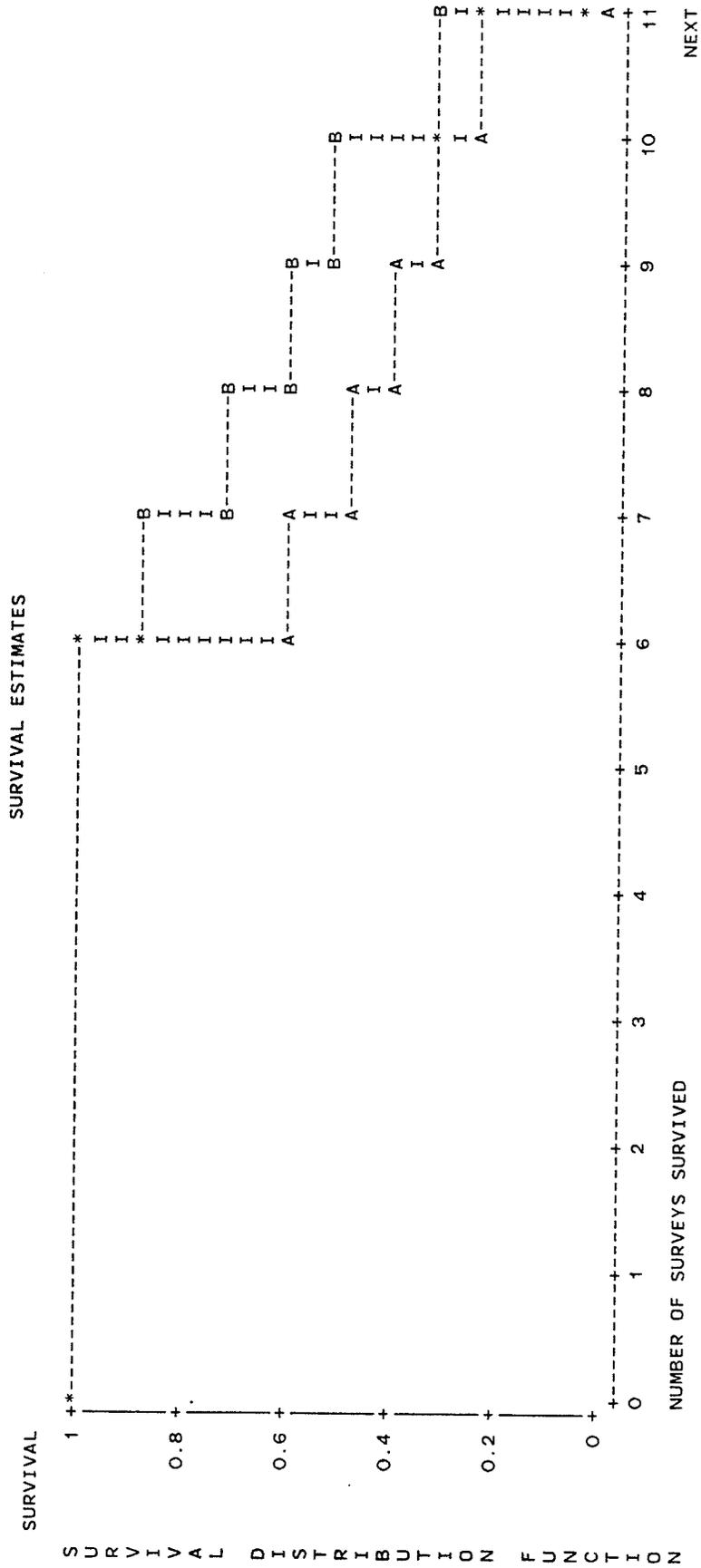
It appears from the table that the difference in survival distribution between the two familial categories is insignificant. Neither of the two tests are significant, implying that the survival distributions obtained do not differ either at early or larger survival times.

But this should not be taken as the basis for rejecting the alternative hypothesis. As Table 8 has shown, the exper-

imental - control survival rates were similar during the "start-up" and "wind-down" phases of the experiment but noticeably different during the mid-period surveys. It is possible that close similarity at the two tails may have blotted out the differences found in the middle.

In order to counter this problem, we will resort to experimental segmentation - i.e., compare the survival times over the different phases (sometimes in isolation and sometimes in pair of twos). An exhaustive enquiry finally revealed significant experimental-control differences between surveys 6 and 11. This may be illustrated by graphing the relevant survival curves for that specific interval.

Fig. 3



But the graph provides only a rough idea of the difference between the two family groups. It does not say whether the differences are significant or merely chance variations.

TABLE 10
TEST(B) OF EQUALITY OVER STRATA

TEST	CHI-SQUARE	DF	P-VALUE
Logrank	1.9327	1	0.1645
Wilcoxon	2.8072	1	0.0938

So once again the Logrank and Wilcoxon tests are necessary.

From the plot of the survival estimates, it appears that the two groups differ primarily at earlier survival times -- e.g., between surveys 6 and 9. The Wilcoxon test also indicates a difference around this time, since this test, which places more weight on early survival times, is statistically significant at the 10 percent level. The Logrank test, which places more weight on larger survival times, was, as expected, insignificant.

We can therefore reject the null hypothesis and conclude that the experimental-control differences are significant

and not attributable to chance variations. In other words, the evidence suggests that once the experimental effects had taken hold, **MINCOME** did promote marital stability by bestowing a direct **income effect** on the recipient families.⁶⁵ Our experimental effects are however weaker than the Groeneveld et al.'s results,⁶⁶ but not in exact agreement with Cain's (1987) findings. Cain was unable to obtain statistically significant experimental effects, whereas in **MINCOME** we did. As for our experimental effects being so feeble, Solow (1986:220) gives a plausible reason:

I don't find this...terribly discouraging...These experiments do not take place in a test tube and they do not involve identical individuals. There is just a lot more going on than can possibly be controlled.

Our view is that the comparatively weaker treatment effect is not surprising, considering the relatively 'smaller' experimental sample size - only about a third of its control counterpart. The fact that despite this handicap the Plans generated statistically significant, stabilising influences (no matter how weak or how short-lived) is welcome news indeed. To advocates of the NIT program, this finding is heartening for three principal reasons:

⁶⁵ The stabilizing influence of the income effect suggests that marital stability is on average, a normal good.

⁶⁶ Groeneveld et al., found that the NIT plans tested in the Seattle-Denver experiment increased the rate of marital disruption among white and black couples by 40 to 60 per cent.

1. increased marital breakups among the poor will increase the number of single mothers and dependent children on welfare rolls and hence the volume of transfer payments made on this account;
2. from a societal-welfare viewpoint, marital disruptions and the consequent desertion by the father of his wife and children are unequivocally considered to be unfavorable outcomes regardless of whether or not the welfare roll increases; and
3. a higher dissolution rate would raise serious ethical questions as it could be construed as suggesting that MINCOME's supplemental payments actually encouraged women with dependent children to seek annulment of their otherwise unhappy unions. Regardless of what they were told about the non-permanent nature of the experiment, it would appear that the treatment wives were nevertheless misled into taking actions detrimental to their long run welfare. From a moral point of view, this is disturbing as it suggests that social experimentation such as MINCOME places their experimental units in an exposed position. The treatment households are led to commitments that hold unpleasant consequences, once the experiment and its supplemental payments have ceased.

6.4 SINGLE FACTOR MODELLING : PARAMETERISING THE EFFECTS OF COVARIATES ON MARITAL DISSOLUTION

Pursuing our exploratory approach further, we will supplement the **Product-Limit** estimates with a parameterization of the effects of a variety of prognostic factors or covariates⁶⁷ - e.g., family income, male/female head labor supply, asset-debt levels, treatment plans etc., - on marital dissolution rates. The objective is to quantify the relationship between dissolution rates and covariates, where the covariates describe changes in the family's prognostic status as a function of time.

Table 11 gives the **single-factor estimates** of marital dissolution rates calculated separately for each category, and also indicates the proportion of marriages terminating by various survey durations. The results confirm many of the theoretical expectations outlined in earlier chapters. To illustrate:

1. among control families only 6 percent of the male-heads employed all year round may have their marriages disrupted by the twelvth interval, as compared to

⁶⁷ The underlying assumption is that heterogeneity in the populations under study is captured by the set of included covariates. On occasion one may argue, that heterogeneity persists because they have not been entirely captured by the set of measured covariates. This failure to correct for unmeasured heterogeneity could lead to an estimated hazard that declines more steeply (or rises more slowly) than the true hazard as well as to biases in the parameter estimates for the included covariates.

TABLE 11
SINGLE-STATE LIFE TABLE ESTIMATES OF DISSOLUTION
PROBABILITIES (BY SELECTED COVARIATES)

COVARIATE	Survey Number				
	4	6	8	10	12
<u>LENGTH OF MARRIAGE</u>					
>= 10 years	0.0750 (0.0356)	0.0750 (0.0611)	0.1058 (0.0795)	0.1058 (0.0890)	0.1390 (0.1326)
<= 3 years	- (0.0036)	- (0.0916)	- (0.0916)	- (0.0916)	0.1053 (0.1589)
<u>FAMILY TYPE</u>					
Childless Couples	- (0.0367)	0.0541 (0.1002)	0.1761 (0.1119)	0.1761 (0.1247)	0.2478 (0.1769)
With Children	0.0278 (0.0284)	0.047 (0.0566)	0.0817 (0.0756)	0.0967 (0.0896)	0.1199 (0.1211)
<u>MALE HEAD CHARACTERISTICS</u>					
< High School Eductn.	0.0242 (0.0326)	0.0451 (0.0687)	0.0830 (0.0839)	0.0992 (0.0944)	0.1243 (0.1264)
> High School Eductn.	0.0351 (0.0172)	0.0737 (0.0363)	0.1579 (0.0363)	0.1579 (0.0891)	0.2060 (0.1452)
Employed 47 Wks. Or More*	- (0.0161)	0.0109 (0.0441)	0.0347 (0.0491)	0.0606 (0.0593)	0.0606 (0.0907)
Employed < 35 Weeks*	0.0563 (0.0465)	0.0727 (0.0815)	0.1619 (0.1086)	0.1619 (0.1313)	0.2211 (0.1838)
Hourly Wages <Min.Wage	0.0741 (0.0515)	0.1391 (0.1118)	0.2633 (0.1425)	0.3048 (0.1669)	0.4007 (0.2304)
Hourly Wages >Min.Wage					
<u>FEMALE HEAD CHARACTERISTICS</u>					
<High School Education	0.0227 (0.0318)	0.0489 (0.0693)	0.0921 (0.0892)	0.1078 (0.1021)	0.1404 (0.1336)

>High School Education	-	-	0.08	0.08	0.08
	(0.0263)	(0.0554)	(0.0554)	(0.0965)	(0.1825)
Full-time Working Wives (**)	0.0351	0.0351	0.0753	0.0753	0.0753
	(0.0602)	(0.1324)	(0.1522)	(0.1946)	(0.2387)
Part-time Workers	0.0284	0.0448	0.0811	0.1006	0.011
	(0.0278)	(0.0519)	(0.0718)	(0.0835)	(0.1223)
Wives' Wages <Min.Wage*	0.037	0.0708	0.1362	0.1569	0.2007
	(0.0372)	(0.0803)	(0.1019)	(0.1190)	(0.1627)
Wives' Wages >Min.Wage*					
FAMILY INCOME SITUATION					
<hr/>					
Below Poverty Level	0.031	0.049	0.0878	0.1085	0.13
	(0.0324)	(0.0767)	(0.0949)	(0.1025)	(0.1411)
Above Avg. Income	-	-	0.1818	0.1818	0.1818
	-	-	(0.1)	(0.2)	(0.2)
Liquid Assets <\$2000	0.024	0.0519	0.0982	0.1149	0.1499
	(0.0281)	(0.0636)	(0.0839)	(0.099)	(0.1359)
Liquid Assets >\$5000	0.0645	0.0645	0.1365	0.1365	0.1365
	(0.0263)	(0.0263)	(0.0263)	(0.0263)	(0.0263)
DEBTS EXCLUDING MORTGAGES					
<hr/>					
Debts <=\$3000	0.0322	0.0395	0.0718	0.0891	0.1069
	(0.0331)	(0.0649)	(0.0805)	(0.0914)	(0.1274)
Debts >\$5000	-	-	0.08	0.08	0.08
	-	(0.0896)	(0.0896)	(0.1239)	(0.1940)
HOMEOWNERSHIP*	0.0118	0.0390	0.0390	0.0390	0.0390
	(0.0174)	(0.0464)	(0.0641)	(0.0734)	(0.1109)
PLAN TYPES					
<hr/>					
Low Plan	(0.0143)	(0.0316)	(0.0688)	(0.0889)	(0.1096)
Med Plan	(0.0316)	(0.0689)	(0.0888)	(0.1061)	(0.1522)
High Plan	(0.0342)	(0.0722)	(0.0722)	(0.0722)	(0.0827)

The numbers in the parentheses are estimates pertaining to the treatment families. One * implies significance at the 5 percent level and ** implies significance at the 10 percent level.

22 percent for those with the poorest employment record. Likewise, for treatment families the estimates in the same category are 9 and 18 percent respectively.⁶⁸

2. Childless couples face a significantly higher chance of dissolution (24 percent for controls and 17 percent for experimentals) as compared to families with children.⁶⁹
3. Towards the end of the surveys, experimental families with below poverty-level incomes faced greater dissolution probabilities (13 percent) as compared to families with above average-level incomes (only 2 percent). Dissolution chances were lower for homeowners as compared to non-owners - 3 percent vis-avis 20 percent for controls; 11 percent vis-a-vis 15 percent for experimental families.⁷⁰
4. By the experiment's end, full-time working wives from control families faced greater dissolution chances (7 percent) as compared to those who worked part-time (only 1 percent). Similar statistics for the experimental households reveal an even graver situation.

⁶⁸ The 'convergence of role perceptions hypothesis' or Hypothesis II of Chapter III.

⁶⁹ Having children being what Becker calls engaging in the accumulation of **marital specific capital**, investment in capital of this type discourages dissolutions (primarily because offsprings are less valuable in the event of a split). See Chapter III for our extension/modification of the Becker hypothesis.

⁷⁰ Hypothesis V, Chapter III.

Theoretically, the working wife's earnings carries a direct income effect which is commonly viewed as promoting marital stability. However, it is equally likely that her independent income source plays a role in her decision to remain married or become divorced. The higher her earnings level in an otherwise unsatisfactory union, the greater her prospects of tilting towards a split - the destabilizing independence⁷¹ effect. Our evidence from MINCOME suggests that for working mothers the independence effect had outweighed the stabilizing influences of the income effect.

On the whole, these findings imply that among MINCOME families, adherence to traditional role specifications is the critical stabilising factor. Marital stability is a function of the male-head's fulfillment of the expected instrumental needs and capacities.⁷² As such factors like continuous male-head employment, home-ownership, higher earnings, etc., - all transmit favourable signals concerning the husband's ability to provide adequately for his wife and

⁷¹ Even early feminists identified money as a means of access to power. For instance, Barbara Bodichon (1827-1891), seen by her feminist contemporaries as having some of the most radical views, argued that women could not be equal to men in marriage without access to some independent means: "unless a women can earn her own livelihood or has a certain income, she has little chance of forming an equal union" (1859,p.19).

⁷² The hypothesis that adequacy in the male-head's role performance is positively related to marital stability, rests on the concept of the family as a matrix of defined, interlocking and interdependent roles. Within the confines of this frame of reference, compatibility between the male-head's role expectations and actual performance would be associated with greater familial stability.

children. Given this type of mental makeup, the working wife is probably perceived by her spouse as a threat to his culturally defined dominance.

MINCOME families thus appear to be slow in their acceptance of new societal roles for women and hence in the acceptance of the new familial division of labor, inevitably necessitated by these changing roles. This result is however quite a surprise because given the income situation of the sampled MINCOME families,⁷³ the working wives would be working primarily in response to the family's perceived financial needs rather than to achieve any individual career goals. Nevertheless, the evidence is that even when the wife works out of necessity, the husband experiences an increase in the negative aspects of marriage - dissatisfaction with the divergence between his own expectations and actual role performance - and that in turn contributes to greater marital instability.

One cannot help but notice that some of the probability estimates appear to be unreasonably large. We should remember however, that these estimates are primarily single-factor results. In the sections to follow, we will note that in a multivariate setting their influence will often be tempered down by the confounding influences of other stabilis-

⁷³ Households with an average 1971/1973 annual income (adjusted for a family size of four) in excess of \$13000, were considered ineligible for participation in MINCOME. Such families were regarded as being too affluent to be of any direct interest to the experimental purposes of the research.

ing variables. For instance, (as discussed in Chapter III), it is highly likely that in a multivariate framework the often strong negative association between childless couples and marital stability, will be weakened by the competing (stabilising) effects of the length of marriage.

Overall, Chapters V and VI corroborate most of each other's findings. Both appear to suggest that economic factors such as amount and stability of family income, type and nature of male and female head employment etc., correlate highly with divorce; also emerging from these chapters is the finding that family instability increases with economic adversity (e.g., increased debt levels). All this is interesting because (and not surprisingly), few sociological findings are better established than the ones just cited. As pointed out in our literature review (Chapter II), sociologists are almost unanimous in their opinion that marriage tends to be more stable among the well educated, well paid white collar workers than among those who are poorly paid and/or are in the blue collar category. Also the lowest marital stability is to be found in the "lowest status" occupations for men and the highest stability in the "high status" occupations.

Continuing our discussion of Table-11, while many of the theoretical expectations noted in Chapter III are confirmed, still the table appears inadequate. For instance, it does not show the extent to which the effects of two or

more variables may overlap. One solution to this problem is a **Proportional Hazards Model** that estimates the dissolution probability when all variables are being considered simultaneously.

6.5 PROPORTIONAL HAZARDS ANALYSIS OF MARITAL BREAKDOWN

The description of hazard models and the rationale for the choice of this methodology have been discussed in Chapter-IV and need not be repeated here. Instead, this section will first examine the hazard of a marital disruption occurring, paying particular attention to the differential risks faced by the two familial groups. Following this we will estimate several proportional hazard models containing estimates of coefficients of a variety of explanatory variables, considered simultaneously. The latter may be considered as more elaborate, explanatory models of why marital dissolutions occur and what roles different variables play in the number, timing and sequence of their occurrence.

6.5.1 Hazard Estimates: Experimentals Vis-A-Vis Controls

The hazard estimates of Table-12 afford a straight forward comparison of the relative marital dissolution risks faced by the two familial categories, since the inception of the experiment. They illustrate the **instantaneous** probability of a marital dissolution (hazard) occurring at time t

(given that such a failure has not occurred before t), and changes in that hazard over time. In short, the hazard estimates emphasise the **conditional** probabilities, while specification in terms of a probability distribution emphasises only **unconditional** probabilities.⁷⁴

TABLE 12
HAZARD ESTIMATES OF PROPORTIONS OF MARRIAGES SURVIVING TO
SELECTED DURATIONS

CONTROLS			EXPERIMENTALS		
Survey	Hazard	Standard Error	Survey	Hazard	Standard Error
2	0.0126	0.0056	2	0.0152	0.0036
4	0.0199	0.0059	4	0.0184	0.0044
6	0.0235	0.0088	6	0.0095	0.0033
8	0.0075	0.0052	8	0.0075	0.003
10	0.0159	0.0079	10	0.0199	0.0051

** The hazard rate has the interpretation

$$\lambda(t) = P \left[\begin{array}{l} \text{Split occurring in the} \\ \text{interval } (t, t+dt) \end{array} \middle| \begin{array}{l} \text{Survived past} \\ \text{time } t \end{array} \right]$$

As the limit of the ratio two positive quantities, the hazard estimate is necessarily positive.

⁷⁴ As noted in Chapter IV, the hazard function is the product of an underlying duration-dependent risk $\lambda_0(t)$ and another factor $\exp(\beta, z)$ that depends on covariates. When there are no covariates present (as in Table 5), $\exp(\beta, z)$ reduces to unity and the model is then called a **null model**.

The hazard estimates shown in Table 12 depend on the time and outcome of the previous event, as well as on previous history. As expected, the comparative familial estimates - treatment versus controls - do not differ dramatically in size during the initial and end-period surveys. The similarity however ends around the middle of the experiment when the experimental families exhibited a greater degree of marital cohesion, as compared to the controls.

One might argue that since the table above shows only minor experimental-control differences, it reflects the relatively "marginal" experimental effects on marital stability. Our interpretation, on the other hand, is that these same estimates could also be indicative of the strong stabilising influences emanating from the various NIT treatments. We take this position because it is possible that MINCOME's experimental data may have been contaminated by differences between the "experimentals" and "controls", in reporting a marital status change. The experimental families were required to report their marital status every month as part of the information system for determining the amount of NIT payments they were eligible to receive. Thus they not only had more opportunities to report marital breakups, but also had strong financial incentives to report even short-term separations as their NIT payments would generally increase if the wife and children were separated from the husband. For controls, on the other hand, no such incen-

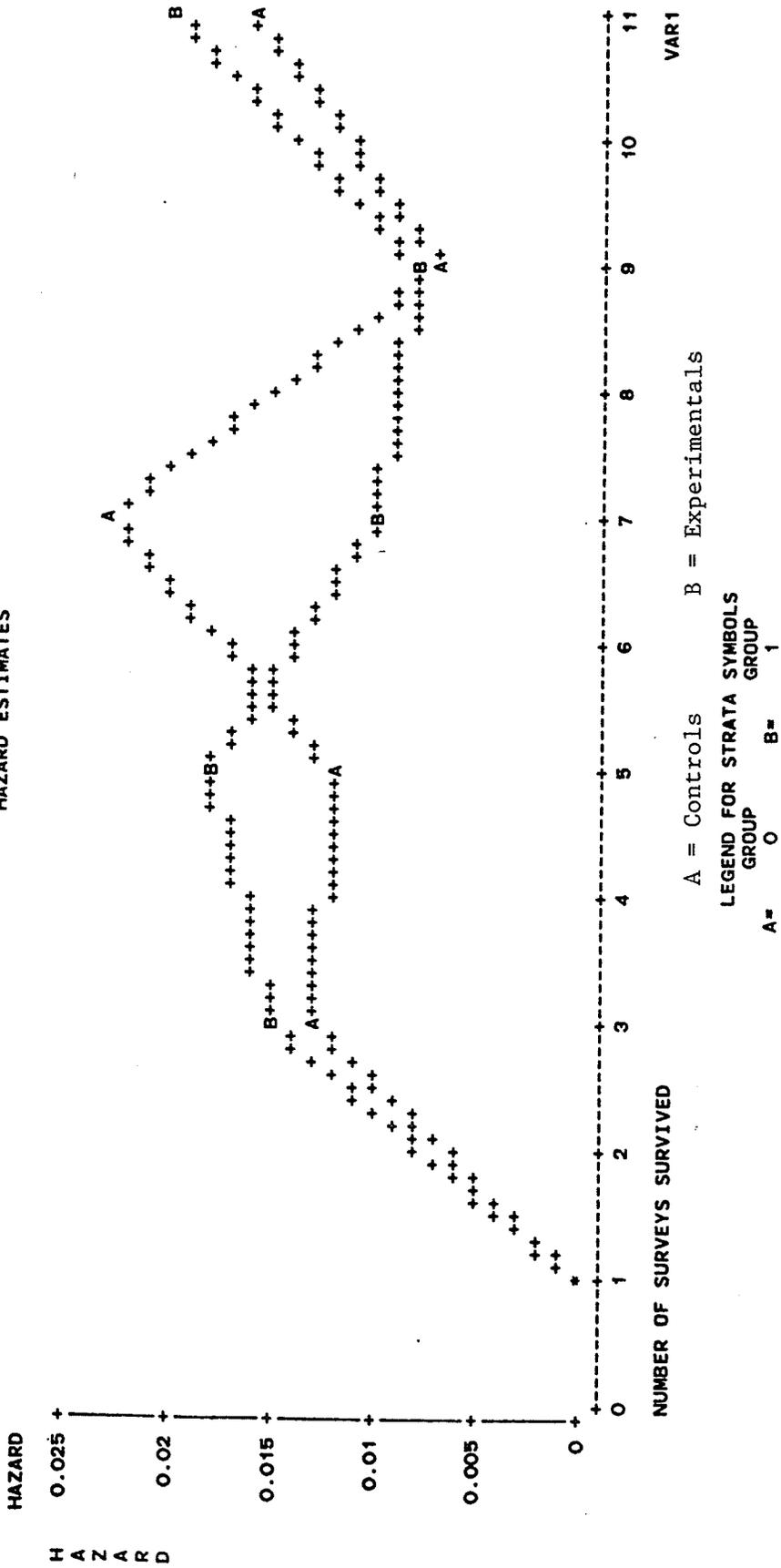
tives were present and consequently a marital separation would be brought to the attention of the interviewers only during their routine meetings, approximately once every four months. In principle, therefore, whereas for control couples a marital separation that lasted "less than four months" might go unreported, for "experimentals" they would be definitely recorded. If all this resulted in an understatement of marital dissolutions among "control couples" relative to the "experimentals", then MINCOME's stabilising influences may not be as "minor" as the table above makes it appear.

Graphically, the pattern of experimental-control differences can be best illustrated by plotting the respective hazard curves. These curves show the competing risks faced by the two family types, as a function of time. Their shapes indicate both the relative rates of movement out of an intact household and the change in that hazard with duration (its progress along the horizontal axis).

Fig. 4

EXPERIMENTAL EFFECTS: TREATMENT VS CONTROLS

HAZARD ESTIMATES



The hazard curve for controls (Curve-A), exhibits **positive duration dependence** until survey seven,⁷⁵ and beyond that there is a reversal. Between surveys VII and IX, the hazard curve has **negative duration dependence.**⁷⁶ Positive duration dependence implies an increasing marital failure rate over time; likewise, negative duration dependence is associated with a falling failure rate.

The discrepancy between the respective familial hazard curves is the greatest between surveys VI and IX. Over this time interval, the curve pertaining to the experimental families (Curve B), dips downward (negative duration dependence), reflecting a greater degree of stability among the experimental families. This comes as no surprise, because the divergence in the survival curves become statistically significant with the onset of Survey VI. In fact, the hazard curves hereby confirm what the survival curves had already established.

To advocates of the experiment, however, the most gratifying finding of all is possibly the demonstration that NIT payments do not encourage the incidence of splits by lowering the financial costs of marital dissolution - i.e., they

⁷⁵ Positive Duration Dependence is the economist's term for the more straight forward statistical terminology "increasing hazard". It is seen to exist at the point t^* if $d\lambda(t)/dt > 0$ at $t=t^*$ and implies that the probability that a split will occur shortly increases, as the experiment increases in length.

⁷⁶ The standard statistical term is "decreasing hazard". Negative duration dependence exists at t^* if $d\lambda(t)/dt < 0$ at $t=t^*$.

are not a de facto alternative to alimony and child support. Such a finding further solidifies their claim that poverty puts a strain on marriages, creating tensions and dissatisfaction which culminate into an eventual dissolution. NIT payments, under such circumstances, are likely to promote marital harmony (and hence stability) through the income changes that they bring about.

Beyond the ninth survey Curve B encounters a reversal and hence onwards, both familial groups - curves A and B - are characterised by positive duration dependence. This (as noted earlier) could mean that towards the end, the experimental effect had worn off and the beneficiaries had reverted back to a behavior pattern consistent with that of their 'control' counterparts.

All these results are interesting because Groeneveld et al., (1983; p.360) tested several models that allowed for a time varying response and concluded that there was "no significant variation over time in the effects (on marital breakups) of NIT treatments." As our graphs make clear - the survival curves and the hazard curves - we reach a different conclusion.

6.5.2 The Proportional Hazard Specification

This section will show how the inclusion of a variety of explanatory or independent variables increase explanation of the hazard function over the null model of Table 11. With this intent we will estimate several proportional hazard models that describe the way in which the hazard function $\lambda(t)$ varies with the effects of the explanatory variables. Only categorical variables will be considered. As such the estimates will indicate the risk of marital dissolution for a particular classification, relative to the reference category.

Model I estimates the effects of most major variables (except female head characteristics), on both the experimental and control units. Model II adds female head characteristics to this list. Model III differs from Model II only in its simultaneous consideration of all the different plans (P1 to P8) rather than their three major subgroups (Low, Medium and High Plans).

Table 13 provides the proportional hazard regression coefficients. It is clear from the set-up that the models are formulated in terms of the effects of the covariates upon dissolution (hazard) rates, rather than upon times to dissolution. A positive coefficient increases the value of

TABLE 13
 PROPORTIONAL HAZARD COEFFICIENTS FOR MARITAL DISSOLUTION

VARIABLE	MODEL					
	I		II		III	
	EXPTL	CTRL	EXPTL	CTRL	EXPTL	
<u>LENGTH OF MARRIAGE</u>						
<= 3 Years (LMR-3)	0.2751	-0.7642	0.2436	-0.7963	0.2719	
>= 10 Years	0.0017	0.2688	-0.2076	0.4948	-0.0445	
<u>FAMILY SIZE</u>						
Childless Couples	-0.3129	0.0962	-0.2933	0.7089	-0.2869	
<u>MALE HEAD EDUCATION</u>						
Completed High School	0.6076	-25.208	0.7753	-25.846	0.6902	
< High School	-0.3381	0.1682	-0.3525	1.1769	-0.3843	
<u>MALE HEAD LABOR SUPPLY</u>						
>= 47 Weeks (YREMP)	-0.2264	1.2745	-0.2382	1.1403	-0.27	
< 30 Weeks (PREMP)	0.4784	-0.063	0.3862	0.0363	0.4249	
<u>FEMALE HEAD EDUCATION</u>						
< High School			-1.4826	-1.2022	-1.5386	
> High School			0.4449	-3.2619	0.4484	
<u>FEMALE HEAD LABOR SUPPLY</u>						
Full-time Workers (FTWM)			1.3574	-1.1864	1.3382	
Part-time Workers (PTWM)			0.5167	-0.7002	0.5064	
<u>ADJUSTED FAMILY INCOME</u>						
Below Poverty Level	-0.2478	-0.7428	-0.295	-0.7866	-0.3129	
Above Average Income	0.4212	-0.5741	0.8837	0.5195	0.8966	
HOME OWNERSHIP	-0.2739	1.5347	-0.4349	1.5815	-0.4074	
LOW PLAN (LOWPL)			0.0375			
P6	-0.7077				-0.8093	
P7	-0.6303				-0.8247	

MEDIUM PLAN (MEDPL)		-0.545	
P3	0.5474		0.5377
P8	-		-
P4	-0.1959		-0.2687
HIGH PLAN (HIGHPL)		-	
P1	-0.3114		-0.3093
P2	-1.3649		-1.3734
P5	-0.8553		-0.9661

the hazard function and therefore indicates a negative relationship with marital stability. A negative coefficient, on the other hand, has the reverse interpretation. It ought to be pointed out however, that the risk of dissolution is not the estimated coefficient itself but instead "e" raised to that power.

Values greater than one indicate that the relative risk of marital dissolution is greater for the group in question, compared to the reference group. It follows therefore that families on LOWPL face dissolution risks that are 0.243 times greater than the risk faced by experimental families who are on HIGHPL. This result is consistent with SIME/DIME's finding that the least generous plans induced the largest destabilising effect. On the whole, though, the results indicate that marital dissolution in MINCOME is not well-ordered by the plans' generosity level. Families on plans of the lowest and highest levels of generosity have a higher propensity to change into a female-headed household

as compared to those on the medium level plans.⁷⁷ It appears that in MINCOME, the destabilising influences of the independence effect were operating in force only at the two polar ends.

By reading across rows, one can determine how the coefficients change as additional factors are added to the model. While some coefficients are relatively stable from one model to another, others show significant differences across models. What is more important however, is the fact that qualitatively a number of the more interesting results of the **single-factor model** hold even in these higher order models. For instance, experimental couples with a full-time working mother, are 288 percent more likely to experience marital dissolution relative to non-working mothers; by comparison, couples where the mother only works part-time are 68 percent more susceptible to a similar fate.

All this lends credence to the earlier conclusion that the working wives' contribution to the family coffer (income) is also a reflection of their expected economic well being in the aftermath of a split. Since it is likely that their work will continue after divorce, the full time working wives are less affected by the loss of spousal income invariably associated with marital disruption. As

⁷⁷ In both SIME/DIME and the New Jersey experiments, marital disruption was fairly well ordered by plan-generosity level. The most generous plans had essentially no destabilising effect. Families on plans of low and medium level generosity exhibited a greater propensity to change.

such, their dissolution risks tend to be significantly higher.

It is also observed that experimental male heads who were employed all year round, face a risk (relative to those working 30 to 46 weeks annually) of only 0.797. By contrast, those with the poorest employment record (less than 30 weeks over the year) are 61 percent more likely to divorce or separate. Home ownership appears to afford greater marital stability as the experimental dissolution risks are only 0.71 relative to those who reside in rental accommodation.

Simply put, all these numbers imply that in a tradition-oriented marriage, marital stability is more often a function of variables that centre around the male head - his year-round employment, higher earnings, home ownership etc. In reality, this is the modal family type wherein the husband's role is instrumental, while the wife's is more expressive-integrative. Marriages that follow this modal model have a greater likelihood of staying intact.

6.6 SUPPLEMENTARY ANALYSIS OF THE EXPERIMENTAL SAMPLE

While it is useful to examine the proportional hazard coefficients, it is often more instructive to look at the effects associated with different combination of characteristics. For instance,

what is the effect on marital dissolution of being a 'below poverty level family (BPLF)' whose male head has a poor employment record - less than 30 weeks annually (PREMP)?

The answer is obtained by simply multiplying the appropriate coefficients. Thus, (for experimentals), a BPLF family with a PREMP male head would have

$$(0.7805)(1.6135) = 1.2593$$

i.e. approximately 26 percent greater chance of experiencing a dissolution, compared to the reference group.

Table 14 illustrates the results of these calculations for the different treatment levels, coupled with a variety of the more important covariates.

The values in Table 14 indicate that being on the Low Plan and having the female head working full time represents the highest dissolution risk. Indeed, for such couples the risk of marital disruption is about four times greater, compared to families where the female head is a full time housewife.

One explanation could be that because NIT plans enable the working wife to retain a portion of her earnings, her being on such a plan generates strong destabilising influences. In other words, it is the tax rates of the plans that matter and affect her incentives to keep the union intact. This might be the reason why we have so far failed to trace any consistent trend in the experimental effects,

TABLE 14
DISSOLUTION ODDS ASSOCIATED WITH PLAN TYPES AND A
COMBINATION OF OTHER CHARACTERISTICS

CHARACTERISTICS	TREATMENT PLANS	
	LOW PLAN	MEDIUM PLAN
Childless Couples	0.7847	0.4382
<u>LENGTH OF MARRIAGE</u>		
<= 3 Years (LMR-3)	1.3245	0.7397
>= 10 Years (LMR-10)	0.8435	0.4696
<u>FAMILY INCOME SITUATION</u>		
Below Poverty Level (BPLF)	0.7729	0.4317
Above Average Income (ABAVG)	2.5122	1.403
<u>MALE HEAD LABOR SUPPLY</u>		
Employed All Year (YREMP)	0.8181	0.4569
Poor Employment Record (PREMP)	1.5276	0.8531
<u>FEMALE HEAD LABOR SUPPLY</u>		
Working Full Time (FTWM)	4.0345	2.2532
Part Time Worker (PTWM)	1.7405	0.972
HOME OWNERSHIP	1.6038	0.8956

when viewed on the basis of plan generosity.^{7 8} In the table above, for instance, when comparing between the low and medium level plans only, plan generosity appears to be a positive factor in marital stability. To illustrate: for families below the poverty level MEDPL reduces the risk of a

^{7 8} Plan generosity being determined on the basis of break-even incomes, one can envisage even high tax rates associated with generous plans, and low rates with those that are comparatively less generous.

marital disruption occurring, from 0.77 to 0.43; being on MEDPL and having the male head employed all year round, brought the dissolution risks down from 0.8181 to 0.4569. But these figures really represent the relative risks, compared to families on the highest level generosity plan. And given our numbers above, the latter turns out to be comparatively most destabilising. As such, we cannot definitely conclude that plan generosity is positively related to the stabilising influences of the situational aspects of marriage - i.e., family income, length of marriage, home ownership etc.

The analysis above can be extended further by taking a greater number of elements into account. For instance,

a home-owning, BPLF family wherein the male head works full-time and the female head works part-time, face a relative dissolution risk given by the product

$$(0.4569)(0.972)(0.8956)(0.4317) = 0.1717$$

In contrast, a family with identical characteristics but on the LOWPL treatment faces a relative risk of

$$(0.8181)(1.7405)(1.6038)(0.7729) = 1.765$$

Once more the stabilising influence of the MEDPL treatment is greater as compared to plans of the lowest generosity level (LOWPL). This pattern may seem paradoxical as it suggests that changes in economic circumstances appear to affect the dissolution rate more when the NIT program's gen-

erosity level is smaller. In particular it implies that a dollar from the medium level treatment plans (MEDPL), increases independence less than a dollar from the least generous plans (LOWPL).

6.7 CONCLUSION

This chapter has made use of models of time dependence in an attempt at demonstrating how the combination of (experimentally induced) changes in family income and independence, can account for the seemingly paradoxical patterns of familial disruption. We discussed and illustrated several types of models of time dependence in transition rates. With the modern family continually changing - expanding in its many capacities and dimensions - we believe that causal inferences cannot be dependably made from static analysis alone. Hence this attempt at a dynamic analysis of the dense and complex webs of its causal relationship.

Chapter VII

SUMMARY AND CONCLUSION - SUMMING UP THE ISSUES IN THEORY AND EVIDENCE, POLICY AND POLITICS

Once upon a time there was a Little Red Hen who scratched about and uncovered some grains of wheat. She called her barnyard neighbors and said, "If we work together and plant this wheat, we will have some fine bread to eat. Who will help me plant this wheat?" "Not I," said the Cow. "Not I," said the Duck. "Guaranteed annual bread," said the Goose. "Then I will," said the Little Red Hen - and she did ... She baked five loaves of fine bread and held them up for her neighbors to see. "I want some," said the Cow. "I want some," said the Duck. "I want some," said the Pig. "I demand my share," said the Goose. When the Farmer came to investigate the commotion he said, "You must not be greedy, Little Red Hen. Look at the oppressed Cow. Look at the underprivileged Pig. Look at the less fortunate Goose. You are guilty of making second class citizens of them...In other barnyards you would have to give all five loaves to the Farmer. Here you give four loaves to your suffering neighbors." And they lived happily ever after, including the Little Red Hen, who smiled and smiled and clucked "I am grateful, I am grateful." But her neighbors wondered why she never baked any more bread. - Merle Lofgren, 1970, Corson County News (So. Dakota).

The analyses of MINCOME's experimental data reported in this thesis, have confirmed neither the worst fears nor the highest hopes for a program of graduated work incentives. While responses varied somewhat across the scales of income and benefit levels, by and large, the experiments neither undermined the moral fibre of the recipients of support pay-

ments, nor did it transform them into exemplary entities.⁷⁹ In other words, the beneficiaries' living patterns were left largely undisturbed and there was little straightforward or unequivocal pattern of response to the various NIT plans.

7.1 THE HYPOTHESES: RE-CONSIDERED

Recapping our experimental results in the light of some of the hypotheses developed in Chapter III:

Hypothesis I: On MINCOME's marital stability effects.

The path model of Chapter V indicated that the MINCOME guarantees (with no categorical requirements as to family structure) had no discernible influence on marital stability. Likewise, our hazard analysis (Chapter VI) demonstrated that the generosity of the experimental plans had no significant effect on family composition changes during the early and end periods of the experiment. It was only over the mid-period surveys that the experimental couples exhibited a comparatively greater degree of stability, as compared to the controls.

This suggests that the nature of a support program sometimes does influence to some degree the stability of experimental households. To advocates of the NIT scheme this is

⁷⁹ This is to say that the MINCOME payments did not cause significant work withdrawals on the part of the respondents; nor did it destabilize the family by threatening the male-head's key familial role and authority.

very satisfying because:

1. it demonstrates that the payment levels did not encourage the incidence of splits by lowering the financial costs of family disruption; and
2. even feeble experimental effects warn us that family composition changes can be affected by income maintenance programs and that different variations may have different effects.

The **hazard curves** (Chapter VI) demonstrated that for a brief period (between surveys 7 and 9), all of MINCOME's experimental families exhibited a markedly greater degree of stability compared to the controls. Likewise, the survival curves showed that over the same range, experimental-control survival differences were statistically significant. No other experiment has shown anything similar to this. Critics of NIT experimentation might dismiss this unique finding with their standard argument:

since the experimental payments were known to last for only three years, the experimental effects may be considered only transitory.

But for MINCOME couples, chosen specifically from the lower end of the income scale, an income source that can be relied upon for three years can plausibly be considered far from transitory. In fact, it is an extraordinarily reliable source, since for this income group, job tenure is characteristically highly insecure and layoffs or other reasons for change in employment status quite frequent.

On this basis, therefore, it may be argued that once the families became familiar with the experiment's mode of operation, the income guarantees succeeded in eliciting rational behavioral response. Because the "getting acquainted" phase requires time, the observed experimental effects are expected to be concentrated in the middle. Finally, as the experiment approaches its termination date and the income source appears increasingly transitory in character, the experimental effects weaken and wither away.

Interestingly enough, this is exactly the response pattern exhibited by the survival curves of Chapter V and the hazard curves of Chapter VI.

The MINCOME results are also exciting because they run counter to the claim by Groeneveld, Hannan and Tuma that the SIME/DIME treatments "dramatically increased the rate at which marriages dissolved among white and black couples". Our results are perhaps more credible because the literature review (Chapter II) of the impact of welfare on marital stability does not offer any indication for expecting large destabilizing experimental effects. Little wonder therefore that following their reanalysis of the SIME/DIME data, Cain and Wissoker's (1988;14) conclusion closely echoes the MINCOME findings:

In our reanalysis we do not find that the data from SIME-DIME justify the conclusion that an NIT program would lead to an increase in marital breakups among already married couples with children. The "pure" NIT program had only a small and statistically insignificant positive relation to

marital breakups, and when allowance is made for the upward bias stemming from differential attrition and from the timing of the marital breakups, the relation between the NIT plans and marital breakups essentially disappears.

Hypothesis II(a): Intermittent or continuous male-head unemployment will precipitate marital disruption.

This is what the earlier chapters referred to as the **role-performance model**, and both the path coefficients and the hazard estimates validate its basic tenets. Our findings go on to suggest that it is not only poverty and male-head unemployment, but even the largely psychological condition of "unemployability" that can foster family deterioration. This latter variable is all the more significant because it serves as a proxy for a host of other less measurable factors, such as male confidence and authority, respect from the wife and children and even the motivation to face the tedium and frustration of daily life. Nothing is so destructive to the male-head's ego as the growing, imperious recognition that his wife and children can do better without him. He gradually begins to succumb to the sinking feeling that his role as "bread winner" - the definitive male activity since the primal days of the hunt - is in jeopardy. Eventually he reacts to this reality by deserting his wife and family - an act of rage and resignation that dooms them to perpetual poverty, and permanently damages the economic prospects of his offsprings.

What transpired above can also be explained in terms of the **frustration-aggression theory** (Henry and Short, 1954).⁸⁰ According to this theory, a marital disruption will result from the male-head's frustration in his attempts to achieve his social and/or career goals and the ensuing aggressive feelings directed either at himself or at his dependants. Since the theory also postulates that economic improvement leads to a decrease in frustration and thus aggression, future researchers in this field might want to concentrate their empirical work on the relation of divorce rates to the business cycle.

Hypothesis II(b): The wife's employment stability is inversely related to marital stability.

Both chapters V and VI suggest that marital cohesion may be placed in jeopardy by the wife's occupational achievement and success. This may be illustrated by posing the following questions:

⁸⁰ One might even choose Emile Durkheim's (1897) famous argument about income fluctuations and suicide, to make an interesting comparison with the MINCOME findings. According to Durkheim, unexpected increases in wealth are just as destabilising as sudden decreases. Either condition creates **normlessness** or **anomie** which raises the suicide rate. In a similar vein, an unexpected stroke of bad luck in the form of chronic or even sporadic male-head unemployment, will transform an optimal match into a suboptimal one and thereby increase the chances of a dissolution.

1. What are the chances of a marital dissolution occurring in a family where the male-head is often unemployed (PREMP) and the wife holds a full-time job (FTWM)?

The answer (obtained by multiplying the appropriate hazard coefficients of Chapter VI) is:

$$(1.3574) (0.4884) = 0.663$$

2. What is the dissolution probability for this same family, when the wife works only part-time (PTWM)?

$$\text{The answer} - (0.5167) (0.3862) = 0.119$$

One reason for the lower dissolution probability in the second case, might be the husband's fear that the wife's total involvement in her own career will eventually devour her interest in him and the children. As she progresses towards her career goals, the family becomes "a forum for the display of material success and its usefulness as an emotional unit or haven necessarily suffers" (Scanzoni; 1976:p.77). Further compounding this problem is the fact that a family with two working-parents is "famished" for time - time to shop, cook, do the laundry, take the children to the pediatrician or for swimming lessons. Increasingly, such couples are coping with this time famine by enrolling the children in daycares, hiring nannies or baby-sitters, sending out the laundry and dining at McDonald's. Rand

demographer Peter Morrison sums up the situation in the following words:

"What we are doing is contracting out for family care. But there is a limit. If you contract out everything, you have an enterprise, not a family" (TIME; Apr.24,1989:p.52).

Hypothesis IV: On children as a stabilizing influence in the marriage.

Both the path coefficients and the hazard estimates agree that variables such as the length of marriage and the presence of children exert stabilising influences on the union. In our extension/modification of the Becker theory, we argued that Becker had overemphasized the role of children. Children in our view are not the *sine-qua-non* for a stable union. Their presence can reinforce the strength of only those relationships, that had already weathered the test of time. How else can one explain the high dissolution rates among couples with a pre-marital conception?⁸¹

Using the appropriate conglomeration of hazard coefficients to test our hypothesis, we find that:

⁸¹ Teachman(1982:1047), for instance, found that women with a premarital birth are 69% more likely to experience marital dissolution.

Using Canadian data, Balakrishnan et al (1987; p.401) found that premarital birth or conception significantly increases the chances of a dissolution, the relative risks being 2.349 and 1.495 respectively compared to women who did not conceive before marriage.

1. control couples that have been married for 10 years or more but are childless face $(0.4948) (0.7089) = 0.35$ times the risk of marital dissolution, compared to those among them with children.
2. experimental couples who are otherwise identical face $(0.2076) (0.2933) = 0.061$ times the risk faced by the reference group.

It appears that the MINCOME hazard estimates do not validate our hypothesis - one that at the outset had seemed so intuitively appealing. But then, this should come as no surprise because (as in the American experiments) a lot of the MINCOME evidence is weak, at times even indecisive.⁸² Perhaps this is indicative of the infinite variety of human behavior and underscores the principle that no program will affect everyone who participates in it in the same way.

It is because of the weak experimental effects that some skeptics allege that the expenditures incurred on social experimentation were unnecessary, as much of the information obtained could have been predicted a priori from economic

⁸² For instance, Cain (1986) points out that the SIME/DIME evidence about the effects of NIT experiments on marital stability is neither decisive, nor even persuasive. In reply, Nancy Tuma (1986; p.99) offers only a weak defense:

a decisive result is rare in any experiment...At best, most experimental results turn out to be "persuasive" or "suggestive". That is, they alter one's best guess (and hypothesis for the next study), but they are never so definitive that a next study is unnecessary.

theory. But this can be true only of the general direction of effects and not of the magnitudes involved, and even then predictions will differ depending upon the type of theoretical model used.

It is true that most of the experiments (and MINCOME was no exception) often produced undramatic and sometimes ambiguous results. But their findings can be considered modest or insignificant only in the face of inflated promises. The fact is that these isolated instances of policy research did have some moderating influence. Their positive contribution is confined not only to what little has been learned about economic behavior, but also includes what has not been learned, or at least what has not been established about the topics under investigation. For instance, they showed that a change in policy would neither be as beneficial as some might hope nor as harmful as others fear; that if there is work reduction, it would be of modest proportions; and in the case of MINCOME, the treatments resulted in greater marital stability among experimental units, even if for a short duration. All these are, in truth, the legacy of income maintenance experiments.

7.2 BIASES IN SOCIAL EXPERIMENTATION

MINCOME in combination with the American experiments, serves as a context for understanding experimental responses and the connections between policy objectives, program options and behavioral outcomes. Its notable contributions have been:

1. the development of an empirically tested frame of reference for describing the welfare system; and
2. facilitating the development of ways of modelling welfare policies and predicting the national impacts of welfare alternatives.

But there are also serious limits on the experiment's powers to predict the effect of an NIT implemented on a Canada-wide basis. This section will describe some of those limitations.

(1) Treatment Combinations. Deciding how many treatments to test, depends to a large extent on which combinations are considered plausible possibilities for a national program. But the number of possibilities being numerous, the choice of treatment combinations is largely a matter of judgement - one that may not be reflective of the ideal choice. And even if the selected treatments are identical to the ideal choice-set, their numbers will often be so large that the estimates from the response surface will be seen to be based on an unacceptably small number of observation points. This

in turn suggests that caution be applied in generalizing the experimental results.

(2) Time-Horizon Effects. A family's response to a program of limited duration may differ from its response to a permanent program. In particular, there is a **downward** bias in the **income** effect because the support available in a finite experiment has a lower capitalized present value than a support guarantee available indefinitely. There is also an **upward** bias in the **substitution** effect because the wage rate which is lowered by the taxes inherent in the various NIT plans, can be expected to return to the higher pre-experimental level after the experiment has terminated. As a result, a limited duration experiment might yield biased estimates, with the direction of bias depending upon the relative magnitudes of the income and substitution effects.

(3) Site Location. Unlike a census, a social experiment does not permit selecting a probability sample of all the eligible families in the country. Since MINCOME was confined to only one province, Manitoba, and to only a few of its locations at that, one could raise serious questions about the representativeness of the results for national projections.

(4) Eligibility. Since budget constraints make it impossible to cover all types of families, the four American experiments each covered (with minor exceptions) a differ-

ent segment of the eligible population. If MINCOME - the lone Canadian social experiment - had included all types of eligible families, budgetary restrictions would cause the number of families in each plan category to be so small, that estimates of the effects of the program would be subject to very large margins of errors. Here again, the problem is one of a trade-off, because by excluding middle-class, double-income families, a growing segment of the Canadian population, MINCOME is limited in its ability to make fruitful comparisons and analyses. For instance, the work motivations and disincentives of male wage earners in the upper and middle-income brackets are not the same as those for the "working poor". But the Manitoba experiment precluded obtaining the necessary data to make such useful comparisons.

(5) Reporting Errors. In MINCOME, as in all social experiments, the subjects themselves report most of the data. Reporting behavior is sometimes subject to random error and to incentives of the experiment itself. Reporting inaccuracies then add an additional element to other sources of experimental error.

(6) The Hawthorne Effect. This effect owes its name to an experiment conducted on factory workers in 1928 at Hawthorne, New Jersey. It argues that the fact that people know they are being experimented upon can have an effect in itself, independent of the nature of the experiment. The

New Jersey experiment is said to have suffered from this problem simply because it was the first of the major social experiments.⁸³

Initially, MINCOME suffered a similar fate as the New Jersey experiment. Press coverage was positive and favorable, but when the experiment refused to release details on the participants and on the program, criticisms concerning "secrecy" and "bureaucracy" mounted. The question then is:

Given the **Hawthorne Effect**, to what extent did MINCOME families alter their behavior because of their awareness of being continually under observation?

In the final analysis, despite all these potential sources of bias, the idea of measuring the effects of policy variables through controlled experimentation on human populations, remains a sound one. True, the implementation of the idea is fraught with pitfalls - pitfalls ranging from the basic design of the experiment to the interpretation and generality of the results. But by testing different variations of the NIT treatments, a great deal of useful information has been obtained on their effects and this could now serve as a basis for informed policy formulation.

⁸³ Initial mass media coverage of the New Jersey experiment gave rise to problems like the one concerning a man who was interviewed at home and at work, on television, and was later hassled at work, laid off, unemployed, separated from his wife, ordered by the court to make child support payments (which he was unable to do), and threatened with being jailed for non-support. It was not clear whether the television program or the experiment itself was the direct cause of his troubles.

7.3 POLICY LESSONS AND IMPLICATIONS FOR THE FUTURE

The legacy of NIT experimentation such as MINCOME, is twofold:

(1) To the credit of the researchers involved, the NIT experiments conducted both in Canada and the United States, made it clear that it is possible to conduct large-scale, rigorous social experiments with the random assignment of participants to treatment and control groups. This is no small achievement when one takes into account the obstacles - e.g., selection bias, contamination of treatment effects, problems of sample attrition etc., - which must be overcome prior to launching social experiments in complex real world settings.

(2) To opponents of welfare reform, the experiments had **unanticipated social effects** (Anderson; 1978: p.149). Critics like George Gilder, Martin Anderson and Charles Murray jumped upon the SIME/DIME results to argue that the implementation of the guaranteed income concept would be horrendously destructive in every way - aggravating rather than alleviating the destabilising influences of welfare on marital stability. At the 1980 Congressional hearings, George Gilder (1980: p.378, 380) testified:

The guaranteed income plans tested in Denver and Seattle...showed some sixty percent increase in family breakdowns...What the HEW experiments showed...was that...millions of jobs and marriages would be in jeopardy if placed in the midst of a

welfare culture where the dole bears little stigma.

Murray (1984: p.152) wrote:

Does welfare undermine the family? As far as we know from the NIT experiments, it does...The results were exhaustively analyzed, as researchers checked out the alternative explanations. None worked. The only salient difference that seemed to explain the substantially higher rates of marital instability ...was the "treatment" itself, the NIT.

In other words, the Hannan-Tuma-Groeneveld conclusion about the destabilising influence of SIME/DIME on marital stability, became part of the conventional wisdom and that in turn hastened the collapse of any hope for comprehensive welfare reform. Key politicians were persuaded that a guaranteed income plan was not the way to go since it was not compatible with maximising family stability in the affected population. Ironically, it was Senator Moynihan, an early champion of the guaranteed income concept - an idea that he had once acclaimed as "the most important domestic proposal since social security" - who chaired the Congressional hearings that finally interned the idea of a guaranteed income.⁸⁴

⁸⁴ Moynihan appears to have been truly converted. At one point during the hearings, he observed:

The Seattle Denver experiment...casts for the first time some real doubt on the proposition that the program...will have the effect of promoting family stability...

In this manner, the Hannan-Tuma-Groeneveld interpretation of the SIME/DIME data has helped to undermine any consideration of a guaranteed income program. Political indifference and hostility towards NIT plan gathered further momentum as the Reagan administration entered the White House, riding on a party platform that included the following statement:

"We categorically reject the notion of a guaranteed annual income, no matter how it may be disguised, which would destroy the fiber of our economy and doom the poor to perpetual dependence" (Republican National Committee, 1980).⁸⁵

Likewise in Canada, the Negative Income Tax mentality has gone into remission. In fact the Canadian situation is worse because while the U.S. experiments have been exhaustively analysed, discussed and debated, the MINCOME data set has until now been left largely untouched. Such negligence was not entirely unanticipated, given the fact that the **tax/welfare backlash** era had set in, causing the NIT option to be abandoned by the welfare establishment and its egalitarian supporters. In other words, there had occurred a profound shift in welfare politics, so much so that at the federal-provincial Social Security Review, the idea of GAI was rejected by the ministers without extensive debate or dis-

⁸⁵ The wheels of policy decision were moving in a similar direction even across the Atlantic. Margaret Thatcher has been British Prime Minister throughout the Reagan era. British prosperity under Mrs. Thatcher has been selective (like Ronald Reagan's), and the gap between the **haves** and the **have-nots** have increased. Thus we find that in both countries, health-care, public housing and other institutions and causes that depend on public funds, have deteriorated.

cussion. The result: on April, 28 1976 the lone Canadian attempt at social experimentation was shelved.

MINCOME could thus provide no results or analyses, only a data base for future research. Perhaps the only beneficiaries of this multi-million dollar attempt at social experimentation, were those who are or have been intimately involved in conducting it. Future researchers will benefit because the great mass of panel data (the only one of its kind in Canada), will ensure that they will have hypotheses to explore for years to come. Their rewards will also be great - professional visibility as well as enhanced relations with funding institutions.

7.4 MARITAL INSTABILITY AND THE FEMINISATION OF POVERTY

We believe that our MINCOME findings on marital stability can make an important contribution to policy analysis by focussing attention to the plight of a new class of poor - **the female headed single-parent households**. This is an area of grave concern particularly since recent research has shown that along with widowhood (generally a function of the aging of the population), lone parenthood and its attendant disadvantages is leading to a **feminisation of poverty** in Canada.⁸⁶ Frequently, such families are headed by women who

⁸⁶ The term **feminisation of poverty** is used not to refer to the incidence of poverty among women, but rather to the growth in the proportion of the poverty population, that live in families headed by females.

are younger than were the heads of lone-parent families in the past, command the lowest incomes and must spend more of that paltry income on shelter than is considered acceptable. They are thus most susceptible to poverty and this demographic shift in the poverty population has tended to increase the overall poverty rate. In fact, Sawhill (1988: 1086) contends that

"if the age, race and sex composition of household heads in 1980 had been the same as that in 1950, decennial census data indicate that the poverty rate would have been 23 percent lower at the end of the period. On average, these changes have been adding about ...0.1 percent point per year, to the incidence of poverty.

Without question, the heaviest toll here falls on the children who in the aftermath of a split, find their familiar and dependable world suddenly cleaved apart. While most children eventually appear to adapt to the changed circumstances, there are residual effects - **sleeper effects** - that may eventually affect their own attitude towards marriage and family.

However, as economists our primary concern here is with the **culture of poverty** aspects of this problem. As such, our investigations will often be geared towards the role of the **sleeper effects** of welfare-proneness. Specifically, we will be interested in questions such as:

1. Will today's welfare child grow up to be tomorrow's welfare adult?

2. How might growth in the number of female-headed single-parent households, contribute to the growth of the underclass in Canadian society?

Translated into policy terms, these questions call for the formulation of policies aimed specifically at making a much needed dent in the cycle of family dissolution. Since the MINCOME payments had succeeded (at least temporarily) in the achievement of that goal, policy makers should perhaps take a closer look at the prospects and promise of this alternative welfare scheme. After all, it goes without saying that no scheme can assist families in raising their standards of living significantly, unless it also succeeds in maintaining them intact.

7.4.1 Further Ameliorative Measures

If bringing about a reduction in the number of marital dissolutions is not feasible, then the following ameliorative policy measures might be taken.

1. Transition assistance. Poverty among today's families is often a **temporary** rather than a **chronic** condition,⁸⁷ typically arising out of a drop in the male-head's earnings or because of a demographic event such as death or divorce. For divorced mothers with dependent children, we recommend **transition**

⁸⁷ Bane and Elwood (1986) using the PSID data, showed that about 45 percent of poverty spells end within one year and 70 percent are over within three years. Only 13 percent last longer than eight years.

assistance to help them make the transition to the post-divorced phase. Such assistance could take the form of temporary income maintenance.⁸⁸

2. Transfers of income in kind. Some of the transition assistance could take the form of low-cost public housing, job guidance and/or training, and more importantly day care for dependent children. Child care responsibilities often make full-time work almost impossible for female single parents. Additionally, day care facilities can mean substantial savings even for non-working, single mothers. The principal reason being that these household-heads not only have less money to spend, but even lesser discretionary freedom as to "when to buy" and "where to buy". To illustrate: we all know that prices on equivalent items often vary from store to store. The wealthy suburban matron can leave her children with a baby-sitter and take off in her car for the store that offers the best bargain. She is thus often observed buying her fruits at one store, milk at another, or draperies at one end of the city and appliances at the opposite end. The poor have no such options. They have no baby-sitter, no car; and often they cannot

⁸⁸ For those concerned about the costs that such a plan might entail, we can cite Bane (1976a, 1976b) and his demonstration that even if these guaranteed maintenance allowances were set only at the poverty level, it would cost the United States government only about 15 percent of its annual defence budget.

spare the bus or cab fare to go bargain hunting. Fenced by financial circumstances within a small geographic area, they are thus forced to buy in their own neighborhood even if the prices happen to be outrageous.

3. Enforcement of child support payments. As mentioned earlier, one reason why single mothers fare so poorly financially in the aftermath of a split, is because fathers often fail to live up to their child support obligations. In fact, efforts to stem the consequent hemorrhage of welfare funds by strengthening child support enforcements are far less developed in Canada than in the United States. In the United States child support enforcement has proven to be cost-effective, as a method for reducing the welfare burden. In 1976 and 1977, for instance, the states collected a total of \$1.6 billion on the basis of a total federal-state-local administrative cost of \$427 million. Individual states did even better. In 1977, Massachusetts collected a total of \$24.3 million based on a total expenditure of \$3.6 million, and other states did nearly equally well (Child Support Enforcement: Second Annual Report, December 31, 1977).

While Canada's 1968 divorce act made it easier to dissolve a marriage, there was no provision made for

the enforcement of support orders. As such, by some estimates nearly 75 percent of all Canadian maintenance orders are in default. True, there does exist reciprocal agreements between most provinces whereby child support responsibilities can be enforced on a runaway father. But these procedures are rarely used. Such agreements have long existed in the United States as well. But they were not seriously utilised at the state level until Washington forced them to. In Canada, on the other hand, no such federal insistence has occurred. The U.S. experience suggests that a Canadian program would more than pay for itself; yet Canadian officials remain strangely indifferent to these potential returns.

4. Upgrading the standards of child support payments. Our final policy proposal focusses on the need to upgrade the present standards of awarding child support. Awards should be increased by establishing uniform child support standards tied to the income of the noncustodial parent and adusted periodically. Sawhill (1977) has developed a methodology for arriving at the optimal level of child support, one that includes adustments for economies of scale, income taxes, economic needs of a new family and long run opportunity costs of marriage and children. Basically, the Sawhill proposal seeks to achieve an equal

sharing of the economic hardships of divorce between the households of both the custodial and noncustodial parents. Implementation of such a policy ought to prove Pareto optimal, as it will lighten the welfare load considerably without making current welfare recipient's any worse off. This would be no mean achievement given the grim perspective of the 1980s, when grandiose government schemes are few and budget deficits pervasive.

The intent of this thesis was not only the empirical study of social change, but a quest for policy proposals (possessing potential for utilisation), as well. With the landscape littered with victims of the divorce epidemic - ex-wives raising their children alone, former husbands trying to start new lives, children torn between two feuding parents etc., - policy makers trying to find ways of translating justified anxiety into focused responsive activity, might find material in this thesis that could be helpful. After all, given their concern for comprehensive welfare reform, it is inevitable that they will be either continuously or recurrently facing a number of the issues under investigation in this thesis. It is probably unlikely that definitive answers can be found in these pages. But the material we have covered could at least be used to bridge the gap between problem awareness and policy strategy.

Appendix A

SPLITS OVER TIME: EXPERIMENTALS VS. CONTROLS

SURVEYS	EXPERIMENTALS		CONTROLS
2	10		3
3	7		2
4	8		1
5	9		3
6	4		5
7	4		2
8	4		1
9	2		1
10	6		1
11	9		3
TOTAL	63		22

** Total Sample Composition: Experimentals 630 and Controls 218 families.

Appendix B

TECHNICAL SUPPORT DOCUMENTS

The following technical support papers are available for users of the MINCOME dataset:

1. MMTP-1 The Objectives and Design of the Manitoba Basic Annual Income Expenditure.
2. MMTP-2 The Sample Design and Assignment Model
3. MMTP-3 The Design of the Payments System of MINCOME Manitoba
4. MMTP-4 The Administration of the Payments System of MINCOME Manitoba
5. MMTP-5 An Evaluation of the Experimental Sample of MINCOME Manitoba
6. MMTP-6 Sample Development Over Time, Participation Attrition
7. MMTP-7 An Analysis of Non-Response to the Manitoba Basic Annual Income Experiment
8. MMTP-8 Program Participation in the Saturation Site of the Manitoba Basic Annual Income Experiment
9. MMTP-9 Income Reporting Behavior in a Negative Tax Program: A Comparison of Retrospective and Prospective Reporting Methods in MINCOME Manitoba

10. MMTP-10 The Accuracy of Income Reporting in MINCOME
Manitoba
11. MMTP-11 Issue in the Administration of MINCOME Mani-
toba
12. MMTP-12 MINCOME Field Operations and Interviewing
Techniques
13. MMTP-13 Quality Control and MINCOME Data
14. MMTP-14 MINCOME User Manual (Version 2.0)
15. MMTP-15 MINCOME Subject Catalogue
16. MMTP-16 MINCOME Surveys Catalogue

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