

ECONOMIC INCENTIVES FOR FINANCIAL AND RESIDENTIAL INDEPENDENCE*

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In this paper we examine the impact of the resources of children and of their parents on the children's transition to residential and financial independence. Previous studies of this transition focused primarily on the impact of family structure and parent-child relationships on the decision to leave home, but much less is known about the role of economic factors in the transition to independence. Using data from the Panel Study of Income Dynamics (PSID) for the period 1968–1988, we estimate discrete-hazard models of the probability of achieving residential and financial independence. We find that the child's wage opportunities and the parents' income are important determinants of establishing independence. The effect of parental income changes with the child's age. We also find some evidence that federal tax policy influences the decision to become independent, although the magnitude of this effect is quite small.

Parents are people who bear children, bore teenagers, and board newlyweds.

—Anonymous

During the last half-century, the structure of the American family has changed strikingly. One of these changes, which contributed to an increase in household formation in the United States over the past few decades, was the decline in the age at which a child leaves home and becomes financially independent (Goldscheider and DaVanzo 1985; Goldscheider and Le Bourdais 1986). In recent years, however, there is evidence that this trend has reversed and that children are remaining dependent on their parents for a longer

period (Buck and Scott 1993; Goldscheider and Goldscheider 1993; Heer, Hodge, and Felson 1985).

Homeleaving is a complex process that has generated a diverse literature. Many studies focus on the determinants of departure (or coresidence); others, such as Thornton, Young-DeMarco, and Goldscheider (1993), seek to explain the different pathways out of the home. The variables of primary interest have included family structure (Aquilino 1990, 1991; Buck and Scott 1993) and the “acquisition of adult roles” (Goldscheider and DaVanzo 1985:546), among others. The role of economic variables has been less well documented; the study by Haurin, Hendershott, and Kim (1993) is a recent exception. In this paper we focus on the economic incentives for homeleaving behavior, and define homeleaving to mean establishing both residential and financial independence. Researchers often treat children and parents as independent actors who make decisions without taking into account the other's resources or desires. We consider the decision about independence to be a function of both the child's and the parents' resources; thus we concentrate on the impact of parents' and children's financial resources on the child's decision to become independent.

We also explore the impact of government policy on the decision to establish independence. An important policy debate, which has generated a great deal of research, focuses on how the availability of welfare might affect choices about living arrangements (see, for example, Danziger et al. 1982; Elwood and Bane 1985; Moffitt 1992). Very little research, however, has examined the impact of fiscal and tax policies on decisions about living arrangements made by middle- and upper-income families. In this paper we explore for the first time the role of the dependency exemption in the U.S. federal tax system in determining living arrangements. This exemption is a tax subsidy that lowers the costs of raising children and, in general, reduces the costs of supporting any dependents. In recent years several bills have come before Congress, which propose to increase the statutory value of the exemption by as much as 60 to 85%. Both President Clinton, in his 1995 State of the Union address, and the Republican “Contract with America” call for a dependent tax credit of \$500, almost twice the average value of the current tax ex-

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emption. Thus, recognizing the impact of the exemption on decisions about household formation has important policy ramifications.

Of course, a number of explanations for a child's decision to become independent do not directly involve economic variables. For example, conflict between the child and the parents may cause the child to leave home. Aquilino (1991) reviews the literature documenting that conflict often is present in families with a stepparent, for instance, and that this conflict may explain why children living with a stepparent leave home at an earlier age than children residing with both biological parents. Also, family members may disagree about when adult roles are to be assumed (Goldscheider and Goldscheider 1989). Then, too, the child's future career or family plans may require that he or she leave home. We attempt to account for some of the various explanations for establishing independence by including nonfinancial variables in our analysis, such as intact family, family size, and region of residence. Unlike the authors of many previous studies, however, we can incorporate a rich set of economic variables. Thus our contribution in this paper lies in providing more information about that piece of the independence puzzle.

In the following section we outline the theoretical framework of our paper. In subsequent sections we discuss the data and the estimation results. Finally, we present our conclusions and the policy implications of this work.

THEORETICAL BACKGROUND

In the empirical literature on the economics of the family and human resources, economists tend to model the behavior of a single economic actor and to ignore the interactions between actors. For example, a large literature exists on parents' decisions about fertility and the allocation of time and resources to children (see Becker 1991; Lazear and Michael 1988). Similarly, the literature on educational and marital choices in developed countries treats the adolescent child as the primary economic actor (Becker 1975, 1991; Frieden 1974; Keeley 1979; Preston and Richards 1975; Willis 1986). Economists only rarely estimate models of behavior as determined jointly by parents and children.¹

1. In much of his work on intergenerational mobility, Becker (1991) explicitly notes the potentially conflicting goals of parents and children. The work on bequests (Bernheim, Shleifer, and Summers 1986) also incorporates intergenerational conflict. Almost all of this work, however, is theoretical rather than empirical. Economists only recently have begun to devote some attention to intrahousehold bargaining. See, for example, the papers in the special fall 1990 volume (25(4)) and the fall 1994 volume (29(4)) of the *Journal of Human Resources*.

Two important exceptions are the papers by McElroy (1985) and Hill and Hill (1974) on the decision to leave the parental home. Both of these view the child and the parent as involved jointly in the residency decision. A framework that involves multiple decisionmakers is particularly appropriate for this behavior because at the age when children generally begin to establish independence, they are old enough to be treated as separate economic actors but so young that their parents still may have the desire and the resources to influence their behaviors. The framework that we use in this paper combines aspects of these two papers, together with insights from the sociological literature on the transition to adulthood.

We define independence as leaving the parents' home and being financially independent; thus variables that effect either are determinants of independence. In our model, children remain dependent on their parents when both the parents and the children benefit from that arrangement. At any given age, the child has some demand or willingness to pay to remain dependent on his or her parents. (The willingness to pay could be negative if the perceived benefits are small.) The parents control whether the child is allowed to remain dependent. We can think of the parents as having a supply price at which they are willing to accept their child's continuing to live at home and/or remaining financially dependent. This price could be negative if the perceived benefits of (for example) having the child in the house are large. This supply-and-demand framework is similar to that proposed by Hill and Hill (1974). It is optimal for the child to remain dependent on the parents as long as his or her maximum willingness to pay for the benefits from that arrangement (either in terms of services or in monetary contributions to the household budget) is greater than the parents' minimum willingness to accept having the child as a dependent.

The maximum the child is willing to pay is equal to the difference between the utility she receives from being dependent on her parents and the utility she would receive from an alternative arrangement, such as living independently or with a spouse. This difference represents the threat point in McElroy's (1985) framework. Willingness to pay depends on the child's demand for privacy, which is often assumed to be a normal good (see, e.g., Michael, Fuchs, and Scott 1980); that is, the demand for privacy rises with income. Willingness to pay also depends on the value of alternative opportunities such as marriage. This willingness varies negatively with potential income and positively with the costs of living alone. In addition, demand for privacy or independence may increase with age. If willingness to pay becomes negative, the parents could make positive transfers to the child to induce her to stay at home.

The determinants of parents' willingness to have the child remain dependent are complex. If parents care about

the child's well-being, generally, they will make a net positive transfer of resources to that child; the willingness to accept, or the supply price, will be negative. The transfer of resources should increase with parents' income, if the child's well-being is a normal good. If parents care about the child's well-being but have no explicit preferences about the timing of the child's independence, then the decision is made solely by the child. In that case we might expect a negative relationship between parents' income and the probability that a child becomes independent. This income increases the resources potentially available to a dependent child and thus increases the attractiveness of that option.²

If parents also have a demand for privacy, then their supply price the price at which they are willing to supply housing for their children will increase with income. In this case, parents' income will be correlated positively with the probability that a child leaves home (DaVanzo and Goldscheider 1990). This privacy argument holds true only for the decision about residential independence; the timing of financial independence should not be affected by the demand for privacy.

It is also possible that parents have explicit preferences which are independent of, and perhaps in conflict with, the child's own preferences for leaving home and becoming financially independent. This situation could occur if parents have paternalistic preferences. DaVanzo and Goldscheider (1990) point out that parents may support a child if they value the activity in which the child is participating, such as school. This also might occur if parents care about the child's long-term well-being but have better information than the child about how to achieve positive outcomes. Virtually all economic models of the family have ignored the issue of when a child is mature enough to make decisions that are in her own best interest.

The sociological literature on the transition to adulthood has addressed this issue, however. As Avery, Goldscheider, and Speare (1992) suggest, parents prefer that younger children remain dependent so that the parents can maintain some control over their behavior. Research has shown that taking on certain adult roles, such as childbearing and marriage, at very young ages has severe negative consequences for children. Higher-income parents have greater resources to induce their children to avoid these behaviors and to remain depen-

2. It is also possible that if children value independent living quarters, altruistic parents will be increasingly willing to subsidize their children's housing as income increases. By our definition, however, these children may not be financially independent if their parents are largely responsible for their support. In addition, it is cheaper to transfer resources to children living in the same household because of the "public good" nature of housing and other shared consumption. For this reason, residential and financial independence are synonymous in the large majority of cases.

dent on them. As the child matures, parents' and child's preferences about the child's behavior may converge, and the role of parental income in controlling behavior should decline.

The framework outlined above has fairly clear implications for the impact of children's financial resources on the probability of establishing independence: the higher the child's own income, the greater that probability. The role of parents' income, however, may have offsetting effects and may vary with the child's age.

A government subsidy, such as the exemption for dependents in the U.S. income tax code, also may have competing effects. Because the child can claim the tax exemption if she is financially independent, the probability that the child becomes financially independent may be related positively to the value of the exemption. The parents have an offsetting incentive to keep the child in the home if the child can be claimed as a dependent. Therefore, the probability that the child becomes financially independent should vary negatively with difference between the tax value of the exemption to the parents and the tax value of the exemption to the child. The maximum value of this difference in the 1993 tax year was approximately \$775.³

Other financial considerations include the availability of public support, the affordability of housing, and the youth unemployment rate. Young women may consider the availability of AFDC when deciding whether to leave home and become independent of their parents.⁴ In contrast, parents of boys and girls under age 18 who are receiving benefits for their dependent children will have an incentive to keep those children dependent. Thus welfare benefits may have only a small net effect on independence because of offsetting incentives. Lower rental prices reduce the relative savings from economies of scale in shared housing, and might encourage the child to establish an independent residence at an earlier

3. This assumes that the parents are in the maximum tax bracket of 33% and that the child has income below the taxable level. The statutory level of the exemption in 1993 was \$2,350. Anecdotal evidence about bargaining in divorce settlements, as to which parent will be allowed to claim the children as tax exemptions, tends to support the idea that this subsidy, at the margin, might have an empirical effect on some behaviors. In previous work (Whittington, Alm, and Peters 1990) we found evidence that the reduction in child costs due to this tax subsidy increased fertility rates in the United States. After age 19, a child is eligible to be counted as a deduction only if he or she is in school full-time or is earning less than \$1,900 (1988 law) and if the parents are providing at least half of his or her support. Thus for older children the effect of the deduction will be confounded with the impact of educational choices.

4. Before 1988 only half of the states had provisions for two-parent households to receive AFDC if the husband was unemployed. These programs, however, were rarely used. Thus the incentive provided by AFDC to form a new household is relevant primarily for females.

age. Higher unemployment rates have two potentially offsetting effects. First, the lower probability of obtaining a job will reduce expected income and lessen the probability that a youth will want to become independent. Second, in contrast, higher local unemployment rates may encourage the youth to leave home and search for a job elsewhere.

The literature on the transition to adulthood emphasizes that leaving home is a natural transition in the lifecycle and therefore is correlated strongly with age. In addition, leaving home and becoming independent is related closely to other lifecycle events such as entrance into marriage and completion of schooling. Thus we might expect family background variables that affect the demand for education or the demand for marriage and children to be correlated with the decision to become independent. Several empirical papers explore homeleaving or returning as a function of school status or the pathway out (Avery et al. 1992; Buck and Scott 1993; Goldscheider and DaVanzo 1985), but the literature contains no structural theoretical model of the joint determination of these behaviors.

Haurin et al. (1993) account for the potential simultaneity of household formation and of marriage and fertility by treating marital status and children as endogenous determinants of the decision to live outside the parental home. They estimate a static model of the living arrangements of a group of young people in their twenties in a single year (1987). We take an agnostic view and estimate reduced-form relationships in the empirical analysis presented below; this approach allows us to estimate a dynamic model of the transition to independence. We also can incorporate parental financial characteristics not available to Haurin et al. in their data, and our sample members span a larger age range.

DESCRIPTION OF DATA

Our sample is drawn from the 1988 cross-year file of the Panel Study of Income Dynamics (PSID). The original 5,000 families in the PSID consist of a low-income sample and a random probability sample. We use only the 2,930 families in the random probability sample for our analysis.⁵ The unit of observation in our study is a dependent child. We select children born from 1953 to 1973; 2,182 cases meet these criteria. Because siblings may share unobserved family-specific characteristics, we randomly select only one child from each family, thereby reducing the sample to 925 children. Next we eliminate cases in which the family dropped out of the

5. The random probability sample represents essentially a random cross-section of income levels and family characteristics (Beckett et al. 1988).

survey before the target child reached age 14. This criterion reduces the sample to 876 children. Finally, we eliminate two cases in which the family lived outside the United States. This leaves a sample of 874 children: 449 males and 425 females.⁶

The data are arranged in person-year format. The dependent variable is equal to 1 if the child became independent since the previous survey, and 0 otherwise. All time-dependent covariates are measured during the previous survey. A child is included in the sample beginning with the year in which he or she reaches age 15 and ending with the year when he or she first establishes both financial and residential independence (or 1988, the last year of our data).⁷ The data for the dependent variable span the 20 years from 1969 to 1988 and include a total of 5,325 person-years. Variable definitions and sample characteristics are presented in Table 1.

The PSID defines a departure as establishing a household independent from the parent (called a "split-off" or a "mover out").⁸ If the child is living in institutional housing, such as at college, that child is not considered to be independent unless he or she is determined (by the PSID staff) to be clearly self-supporting. We consider the child to be independent if he or she joins a sibling's household, resides in a group living arrangement or alone in a noninstitutional environment, joins the military, or leaves the home for marriage. Children who have an income but are still living in the parental home are not classified as independent. Our definition of homeleaving considers both financial and residential independence, and thus differs from the literature that considers only residency decisions (see, for example, DaVanzo and Goldscheider 1990; Haurin et al. 1993; Thornton et al. 1993).⁹

6. The PSID assigns values for missing income data, but this situation is infrequent. In 1988, for example, 95% of the cases required no assignment. We use assigned values and thus have no cases deleted because of missing income data. Given the construction of our variables, we did not find it necessary to delete any cases because of missing values other than those of nonresponse households.

7. We may miss some instances of first departures because the data do not allow us to identify departures of less than one year in duration. Using SIPP data, Avery et al. (1992) identify a number of cases in which a child left home and then returned within one year.

8. In most cases the PSID does not consider a child to be a split-off until age 18 or above. Exceptions to this rule are made when a child clearly is living independently and is self-supporting. We also could identify some departures that were not explicitly called split-offs (e.g., for military service), and included them in our sample. The PSID staff, however, is conservative in classifying individuals as split-offs (i.e., financially independent) before age 18; this limitation may bias the results for those who leave home at very young ages.

9. Two hundred and thirty-one of the young people (26% of the sample) reside outside the parental home for at least one interview period but are not financially independent. In 735 person-years (14% of the sample years) the

TABLE 1. SAMPLE CHARACTERISTICS FOR 5,325 PERSON-YEARS

Variable ^a	Variable Definition	Weighted Mean (Std. Deviation)
Parental Income	Log of (after-federal-tax income of parents in thousands/state wage index)	3.10 (1.10)
Parental Income × Age	Parental income × child's age	56.66 (22.06)
Child's Wage	Log of predicted wage of child	1.52 (0.28)
Tax Exemption	Log of (tax value of federal income tax exemption for dependent based on parent's tax rate/state wage index)	5.18 (1.95)
Average Exemption	(Tax value of average federal income tax exemption for sample/state wage index)	211.49 (63.47)
Difference from Average Exemption	((Tax value of federal income tax exemption for dependent based on parent's tax rate – average exemption)/state wage index)	132.34 (188.06)
AFDC	Log of (maximum state Aid to Families with Dependent Children guarantee for a family of two/state wage index)	5.73 (0.38)
AFDC × Age < 18 × Income ≤ 10,000	AFDC × (dummy variable = 1 if child is less than age 18) × (dummy variable if parents have real income < 10,000)	0.28 (1.23)
Rental Housing Cost	Log of (value of regional gross rental cost/state wage index)	5.72 (0.16)
State Unemployment Rate	State annual unemployment rate if age > 19; state annual youth unemployment rate if age 15–19	14.77 (6.28)
Deviation from National Unemployment Rate	State unemployment rate – national unemployment rate	–.001 (3.34)
Education of Head of Parental Household ^{b,c}	Number of years of schooling completed by head of parental household, measured when child is 14	11.56 (4.38)
Education Missing ^c	Dummy variable = 1 if measure of education is missing for head of household	0.09
Both Parents Present in Home at Age 14 ^c	Dummy variable = 1 if child lived in a family with two parents at age 14	0.79
Family Size	Number of family members residing in the home	3.97 (1.46)
White ^c	Dummy variable = 1 if head of child's household is white	0.91
Rural	Dummy variable = 1 if child lives in an area with population < 50,000	0.25
South	Dummy variable = 1 if child lives in southern U.S.	0.23
Northeast	Dummy variable = 1 if child lives in northeastern U.S.	0.29
North Central	Dummy variable = 1 if child lives in north central U.S.	0.33
West	Dummy variable = 1 if child lives in western U.S.	0.15
Birth Year ^c	Last two digits of the child's birth year	60.48 (4.41)

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Variable ^a	Variable Definition	Weighted Mean (Std. Deviation)
Age	Child's age	18.43 (2.93)
Male ^c	Dummy variable = 1 if individual is a male	0.55
State Wage Index	State median manufacturing wage/ national median manufacturing wage	1.01 (0.13)

^aAll dollar amounts are converted to 1983 (real) dollars.

^bIn cases of missing value, household head's education is set equal to the mean.

^cMean is for 874 sample members.

During the 20-year span, 626 children (72%) are identified as split-offs; 76% of the young women and 68% of the young men become independent. The median age of independence is 19 for the women and 21 for the men.¹⁰ Figure 1 shows the Kaplan-Meier estimates of the hazard rates for departure, for men and for women separately. The hazard rate generally rises for the women until age 22, falls briefly, and spikes again at age 26. For the men, the hazard rises until age 21, falls slightly at age 22, increases again until age 25, and then declines. Almost 50% of the women established independence in the year they married. Men are more likely than women to be observed living alone, in group quarters, or in the military.

We expect the probability that a child becomes independent to be affected by financial resources, by other factors influencing the value of opportunities outside the parental home, and by sociodemographic and family background characteristics. The set of financial variables includes after-tax parents' income (net of the child's income),¹¹ the child's expected wage rate, the value of the dependency exemption to the parents, the potential AFDC benefit, unemployment rates, and the regional rental cost (from the Current Housing Reports Annual Housing Survey).

We use two variables to capture unemployment effects: the state unemployment rate and the deviation of that rate

individual is residentially independent but is not classified as a split-off because he or she is still tied financially to the parents. In more than 92% of these years, the child is in an educational institution. The remainder reflect years in health, correctional, and religious institutions.

10. We calculate the median only for children born before 1969 because at least 50% of those birth cohorts had left home by 1988.

11. Parental income does not include income from the nonresident parent in cases where the parents are divorced. Taxes paid were calculated in the PSID for all but one year in our sample; for that year (1968) we assume that all taxpayers took the standard deduction.

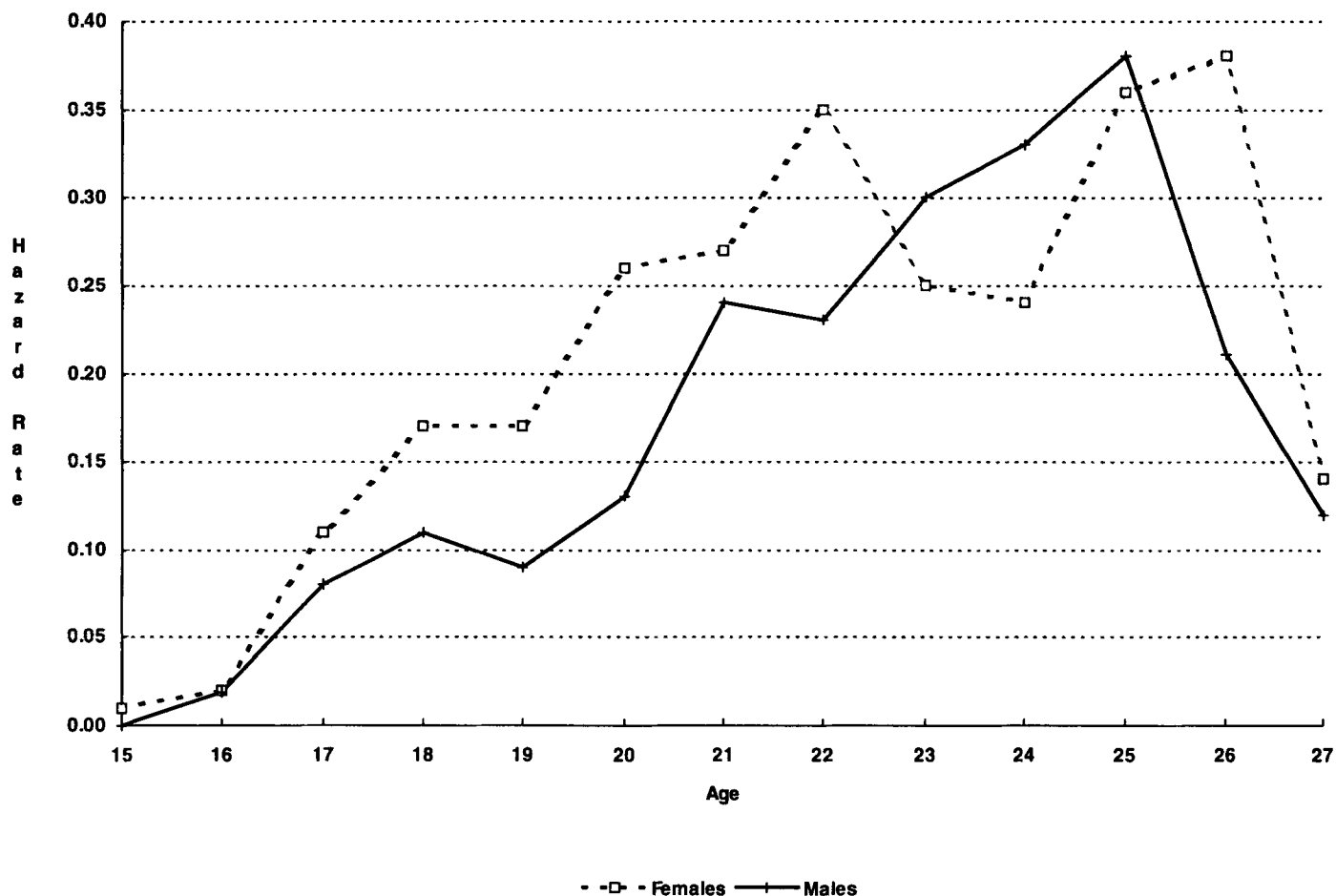
from the national rate. Our theoretical framework suggests that the regression should include the difference between the tax value of the exemption to parents and to children. Because of severe problems of multicollinearity, however, we include only the tax value for the parents' household.¹² We calculate this value by multiplying the level of the dependency exemption by the parents' marginal tax rate.¹³ We also decompose the tax exemption into an annual average value and the difference from the average for each observation. All financial variables are time-varying, and thus are measured in constant 1983 dollars. Incomes and rental costs vary across states, in part because of differences in the cost of living. Because no official state-specific annual cost-of-living index exists, we use the state manufacturing wage as a proxy to adjust for the cost-of-living differences.¹⁴

12. Because parents and children face the same tax code in any given year, the difference in the values of the exemption is correlated highly with the difference in their incomes. The results from regressions that included parental income, the child's predicted wage, the value of the exemption to parents, and the potential value of the exemption to the child (based on the child's predicted wage) were highly unstable; thus we chose to report the results from regressions that include only the value to the parents. This family-specific measure of the exemption benefit is potentially endogenous if tastes for independence are correlated with behavior that produces the value of the exemption benefit (namely parental income.)

13. The PSID data set includes generated marginal tax rates for years since 1975 (1976 interview year). We calculate a household's marginal tax rates for 1968–1974 under the same assumptions about deductions as used by the PSID staff (see Institute for Social Research 1988).

14. Although cross-state price indices are not available, the Bureau of Labor Statistics (BLS) calculates cost-of-living indices for some SMSAs. To assess the appropriateness of using the state manufacturing wage as a proxy for a cost-of-living index, we calculated the correlation coefficient between the BLS price index in selected SMSAs and the relevant state median wage for selected years in the 1970s and 1980s. We found a correlation of .81.

FIGURE 1. HAZARD RATE OF ESTABLISHING FINANCIAL AND RESIDENTIAL INDEPENDENCE, BY AGE



EMPIRICAL ANALYSIS

The results presented in Tables 2 and 3 are taken from logit regressions of the probability that a child has established residential and financial independence since the previous survey. When the data are arranged in person-year format, as described above, the logit regression can be interpreted as a discrete-hazard model (Allison 1984).

We predict the child's expected wage rate using the estimates from log wage regressions reported in Appendix Table A1. We estimate the regression separately for males and for females, using all person-year observations in which a wage is reported, including years before and after estab-

lishing independence. There are 2,845 male years with a wage and 2,228 female years. We regress wages on a standard set of family background variables and other socioeconomic characteristics.¹⁵ We include age, age squared, and age cubed in the regression to account for the nonlinear shape of age-earnings profiles. We interact age with the respondent's birth year and education to capture the cohort and education effects on age-earnings profiles that have

15. To adjust for cost-of-living differences in the predicted wage, we leave the state median manufacturing wage variable out of the regression. The predicted wage is thus evaluated at the average cost of living (i.e., manufacturing wage) for all states.

TABLE 2. FEMALES: SELECTED MAXIMUM-LIKELIHOOD ESTIMATES OF LOGIT MODELS PREDICTING THE PROBABILITY OF A CHILD'S ESTABLISHING INDEPENDENCE^a (CHI-SQUARE IN PARENTHESES)

Variable	Model ^b				
	1	2	3	4	5
Parental Income	-.252*** (23.02)	-.213*** (14.93)	-.235*** (15.82)	-.215*** (15.04)	-.301*** (18.87)
Income Squared	-.011** (4.60)	-.001* (3.49)	-.008 (2.60)	-.010 (2.31)	-.007 (1.30)
Income × Age	.015*** (32.34)	.013*** (21.54)	.013*** (22.13)	.013*** (21.45)	.016*** (24.76)
Child's Wage		.524*** (10.71)	.522*** (10.59)	.529*** (10.92)	.477*** (8.63)
Tax Exemption			.008 (1.08)		
Average Exemption				.0004 (2.58)	.0006** (3.93)
Difference from Average Exemption				3.5E-07 (0.00)	-1.8E-05 (0.03)
AFDC					-0.79*** (6.38)
AFDC × Age < 18 × Income ≤ 10,000					-.022** (4.70)
Rental Housing Cost	.039 (0.19)	.018 (0.04)	.017 (0.04)	-.035 (0.12)	-.050 (0.25)
State Unemployment Rate	.001 (0.03)	-.0002 (0.00)	-3.8E-05 (0.00)	.004 (0.59)	.004 (0.56)
Deviation from National Unemployment Rate	.003 (0.21)	.003 (0.33)	.003 (0.29)	-.001 (0.03)	-.003 (0.64)
Education of Head of Household	-.0006 (0.10)	-.002 (1.24)	-.002 (1.13)	-.002 (1.17)	-.003 (1.55)
Education Missing	-.056* (3.03)	.001 (0.00)	.0004 (0.00)	.002 (0.00)	.001 (0.00)
Both Parents at Home at Age 14	-.029 (1.92)	-.031 (2.20)	-.031 (2.15)	-.030 (2.02)	-.029 (1.82)
Family Size	.008 (2.30)	.008 (2.42)	.009* (2.91)	.008 (2.04)	.007 (1.66)
White	.091*** (9.60)	.024 (0.45)	.021 (0.33)	.022 (0.38)	.029 (0.64)

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Variable	Model ^b				
	1	2	3	4	5
Rural	.020 (0.90)	.110*** (10.15)	.109*** (10.03)	.106*** (9.31)	.103*** (8.61)
South	.017 (0.41)	.065** (4.44)	.067** (4.70)	.042 (1.50)	-.002 (0.00)
Northeast	-.057** (4.58)	-.062** (5.54)	-.061** (5.26)	-.070*** (6.69)	-.063** (5.44)
North Central	-.010 (0.09)	.022 (0.42)	.023 (0.45)	.015 (0.19)	-.009 (0.06)
Birth Year	.084 (1.48)	.070 (1.01)	.072 (1.07)	.079 (1.27)	.077 (1.18)
Birth Year Squared	-.0007 (1.60)	-.0006 (1.00)	-.0006 (1.06)	-.0006 (1.14)	-.0006 (1.11)
Intercept	-3.010 (1.84)	-3.212 (2.08)	-3.266 (2.15)	-3.495 (2.40)	-2.679 (1.38)
Chi-Square for Covariates (Degrees of Freedom)	294.20*** (37)	295.31*** (38)	296.76*** (39)	297.81*** (40)	300.17*** (42)
-2 Log Likelihood	1595.35	1584.10	1583.00	1581.50	1570.06

: * $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

^aTwenty additional variables are included in all versions of the models, but the coefficients are not presented. The variables not shown include 10 dummy variables for ages 18–26 and for age 27 and older, and 10 interaction terms of each age dummy variable with birth year.

^bCoefficients are presented as $\partial p / \partial x = \beta(\bar{P}(1-\bar{P}))$.

been documented in the labor economics literature. The inclusion of these interaction terms and of cubic and quadratic age terms in the age regression is a standard method of identifying the wage effect (Mroz 1987). As additional identifying instruments, the variables accounting for mother's employment status in the male regressions and for the state minimum wage in the female regressions are marginally significant in the wage regression and are excluded from the independence regression.

In our specification the exemption represents two competing effects because we use the parents' exemption, not the child's as discussed previously. The greater the exemption available to the parents, the stronger the incentive to keep the child as a dependent. The larger the potential exemption to the child, however, the greater the incentive for the child to be independent.

The tax exemption can be decomposed further into changes over time and differences across households. We isolate these two effects by dividing the exemption into two components: the average exemption of the sample in each year and the difference between that average and the parents' potential exemption based on their marginal tax rate. The first component measures exogenous increases in the value of the exemption due either to inflation or to statutory changes in the law.¹⁶ The second component reflects characteristics of the parents' household, such as income or house-

16. The average tax value of the exemption does not show a smooth trend over time. This value changes sharply for years containing a statutory change in tax laws (e.g., 1971, 1972, 1979), but the general trend has been downward as inflation has eroded its value. (See Whittington et al. 1990.)

TABLE 3. MALES: SELECTED MAXIMUM-LIKELIHOOD ESTIMATES OF LOGIT MODELS PREDICTING THE PROBABILITY OF A CHILD ESTABLISHING INDEPENDENCE^a (CHI-SQUARE IN PARENTHESES)

Variable	Model ^b				
	1	2	3	4	5
Parental Income	-.137*** (8.13)	-.109** (4.63)	-.117*** (4.51)	-.115** (5.07)	-.095 (2.55)
Income Squared	-.006 (1.51)	-.005 (0.91)	-.004 (0.77)	-.007 (1.19)	-.007 (1.29)
Income × Age	.007*** (11.48)	.006*** (6.48)	.006*** (6.60)	.006*** (7.03)	.005** (4.13)
Child's Wage		.746*** (20.08)	.741*** (19.72)	.742*** (19.67)	.756*** (20.17)
Tax Exemption			.003 (0.14)		
Average Exemption				.0005 (2.44)	.0005 (2.43)
Difference from Average Exemption				5.21E-05 (0.36)	5.36E-05 (0.38)
AFDC × Age < 18 × Income ≤ 10,000					.007 (0.44)
Rental Housing Cost	.068 (0.56)	.047 (0.26)	.049 (0.28)	-.008 (0.01)	-.009 (0.01)
State Unemployment Rate	-.006 (1.14)	-.006 (1.19)	-.006 (1.15)	-.0005 (0.01)	-.0005 (0.01)
Deviation from National Unemployment Rate	.007 (1.08)	.007 (1.38)	.007 (1.33)	.002 (0.08)	.002 (0.08)
Education of Head of Household	.0004 (0.03)	-.004 (2.30)	-.004 (2.36)	-.004 (2.54)	-.004 (2.69)
Education Missing	.004 (0.03)	.034 (1.70)	.034 (1.63)	.037 (1.94)	.037 (1.95)
Both Parents at Home at Age 14	.049** (3.69)	.035 (1.91)	.036 (1.99)	.037 (2.14)	.038 (2.18)
Family Size	.011** (4.57)	.013*** (6.17)	.014*** (6.27)	.014*** (6.01)	.014*** (6.16)
White	.092*** (9.16)	.011 (0.09)	.011 (0.09)	.013 (0.13)	.011 (0.10)
Rural	.018 (0.80)	.118*** (15.51)	.118*** (15.30)	.117*** (15.09)	.119*** (15.53)

(continued on next page)

(Table 3 continued from previous page)

Variable	Model ^b				
	1	2	3	4	5
South	.016 (0.34)	-.051' (2.66)	-.050 (2.59)	-.070" (4.16)	-.072" (4.34)
Northeast	-.032 (1.46)	-.085" (8.64)	-.085" (8.53)	-.090" (9.58)	-.092" (9.32)
North Central	-.003 (0.01)	-.049 (2.32)	-.048 (2.29)	-.057' (3.01)	-.058' (3.14)
Birth Year	.047 (0.42)	.061 (0.69)	.060 (0.69)	.070 (0.93)	.070 (0.97)
Birth Year Squared	-.0004 (0.50)	-.0004 (0.54)	-.0004 (0.54)	-.0005 (0.66)	-.0005 (0.69)
Intercept	-2.076 (0.79)	-3.604 (2.35)	-3.600 (2.34)	-3.890' (2.68)	-3.990' (2.82)
Chi-Square for Covariates (Degrees of Freedom)	295.35" (37)	317.07" (38)	317.27" (39)	321.22" (40)	321.41" (41)
-2 Log-Likelihood	1653.78	1630.80	1630.67	1627.89	1627.46

' $p \leq .10$; " $p \leq .05$ "; " $p \leq .01$

^aTwenty additional variables are included in all versions of the models, but the coefficients are not presented. The variables not shown include 10 dummy variables for ages 18–26 and for age 27 and older, and 10 interaction terms of each age dummy variable with birth year.

^bCoefficients are presented as $\partial p / \partial x = \beta(\bar{P}(1-\bar{P}))$.

hold composition, that would lead to a lower- or higher-than-average value of the tax exemption for that household.

The potential AFDC benefit also has competing effects on young women's behavior. The greater the potential benefit, measured in our data as the state's minimum guaranteed level for a family of two, the greater the incentive for a young woman to be independent of her parents. If the young woman is under age 18, however, a large AFDC benefit would encourage low-income parents to retain her as a dependent. As regressors in the female equations we include both the potential AFDC benefit (to capture the first effect) and an interaction between AFDC, a dummy variable for those age 17 or less, and a dummy variable for households with parental income of \$10,000 or less; this figure was the poverty level for a nonfarm family of four in 1983, our base year. Because male-headed households generally are not eligible for AFDC payments, we include only the interaction term in the male regressions.

Receipt of AFDC payments requires additional behavior on the part of the young woman: she must have a child. Therefore the AFDC effect may not be as straightforward as the effect of the exemption or the potential wage. Furthermore, some states allow a woman to continue to live with her parents and do not count the parents' assets in determining AFDC eligibility (Hutchens, Jakobson, and Schwartz 1989). This complication would further dilute the effect of AFDC on forming an independent household.

Table 2 gives selected results for five models for the female sample; Table 3 presents the results for the same five models for males. To economize on space and to focus our discussion on the economic variables, we do not show the jointly significant set of age dummy variables and the age-birth year interactions. (These are available from the authors.) All coefficients are transformed to measure the change in the probability of leaving home, given a one-unit change in the independent variable. The estimates reported

are $\partial P / \partial X = \beta (\bar{P} (1 - \bar{P}))$ from the logit $P = 1 / (1 + \exp(-X\beta))$, where \bar{P} is the sample mean probability of leaving home and β is the untransformed coefficient estimate.

First we consider parental income. As discussed previously, parental income may have offsetting effects on the child's decision to become independent. Aquilino (1990) points out that the results from previous studies are mixed. Our results, however, show a consistently negative effect of parental income for both sexes across all five models, although the effect for females is more than twice as large as for males. The negative sign of the coefficient on the income-squared variable indicates that the deterrent effect of parental income increases with income for females. This coefficient, however, is only marginally significant at best. For males, the coefficient on income squared is also negative but never approaches significance.

In the section on theoretical background we discussed the possibility that the effect of income is a function of the child's age. Parents of younger children might prefer that their children remain dependent, but parents of older children might either be neutral or prefer their children to be on their own. Parents with higher income have more power over their children and would be better able to elicit the desired behavior. To capture this effect, in our regressions we interact parents' income with the child's age. The interaction is consistently positive and clearly significant for all models in Tables 2 and 3. The results show that parental income has a negative effect on becoming independent until about age 18 for girls and about age 19 for boys. After that point, higher parental income increases the probability that the child will become independent. When we excluded the interaction term from the regressions, the coefficient on parental income was often insignificant. Lack of attention to this age-income interaction may explain the mixed results on income from other studies (see Aquilino 1990).

In Models 2–5 we add the child's predicted wage to our regressions. As expected, the child's own income potential has a large, statistically significant effect on the probability of becoming independent. One of the few other studies that explicitly included the child's wage (Haurin et al. 1993) produced similar results. We find that the wage coefficient is about 40% larger for young men, an indication that they are more responsive than young women to changing wage opportunities. It is quite clear, however, that both men and women are highly responsive to wage opportunities.

Because the wage rate is estimated as a function of race, age, head's education, region, and rural residence, including the predicted wage rate in the regressions alters the estimated effects of these other sociodemographic explanatory variables on independence. In Model 1, for example, race is significant. Before the wage is added, our results show that both

male and female whites become independent at earlier ages than do nonwhites. This is the finding, for instance, of Aquilino (1991) and Buck and Scott (1993), neither of whom use a measure of wage opportunities.¹⁷ Once we control for wage opportunities, however, the coefficient on the variable White becomes insignificant, and the independent effect of race evaporates. The explanation for this result is straightforward: whites receive higher wages than do nonwhites, and higher wages are associated with earlier ages of establishing independence. When wages are excluded from the regression, the race variable, in fact, is capturing the effect of wage opportunities.

Another interesting change that occurs when the wage is added to the regression relates to the effect of the household head's education on a child's independence. The level of the household head's education is likely to be a strong indicator of the child's demand for education. In agreement with the idea that these two life-cycle transitions (becoming independent and leaving school) are highly interrelated, we expect that children living in households with highly educated heads would be less likely to become financially independent at an early age.¹⁸ We also know, however, that a child's potential wage and the head's education are correlated positively. When the wage is excluded from the regression (Model 1), the coefficient on head's education is not significantly different from 0; this value reflects the offsetting effects of head's education on wage opportunities and on the demand for education. When the child's wage is included (Models 2–5), the effect of head's education on the child's demand for education is isolated, the coefficient on head's education becomes negative, and the chi-square increases substantially; for males the effect is significant at the 10% level in Model 5.

The addition of the wage causes the positive coefficient on the rural residence dummy variable to increase more than fivefold for both females and males, and to become statistically significant. This result is also due to the channels through which rural residence affects wages. Rural wages, on average, are lower than urban wages; we find this in the wage regression (see Appendix Table A1). Therefore rural residence negatively affects independence through the wage channel. Rural youths, however, marry at younger ages, thus increasing the probability of independence. Once we control for the wage, thus removing the dampening negative influence, rural residence has a large positive impact on the transition to independence for the youths in our sample.

17. Buck and Scott (1993) include hours worked and income earned, but these are likely endogenous to living arrangements.

18. Aquilino (1990) finds that parental education has a strong positive effect on the child's probability of residential independence, conditional on being unmarried.

The addition of the wage creates a significant increase in the coefficient on the dummy variable for the south in Models 2 and 3 in the female regressions, and a significant decrease in the male regressions. The explanation is the same for females as discussed in the preceding paragraph with respect to the measure of rural residence. Southern residence decreases wage rates for women; once the model takes this into account, the effect of southern residence becomes strongly positive. The impact of southern residence on wages differs for males and for females; therefore our results are not symmetrical across genders. Southern residence increases males wages in relation to the omitted category (West), so inclusion of the wage creates a significant negative effect on southern residents' probability of establishing independence.

Although the results are not shown in these tables of selected results, inclusion of the wage variable generally causes a decrease in the coefficients on the age variables and an increase in the coefficients on the age-birth year interactions. The coefficients indicate that the probability of independence generally decreases after age 19 for males. The age-cohort interactions are positive and significant for some male age groups over 23, an indication that the positive effects of age on the probability of residential and financial independence are stronger for more recent cohorts.

In Model 3 we add a third measure of financial resources, one that has not been considered in the previous literature on the topic: the dependency exemption of the U.S. federal income tax. As we discussed previously, the exemption has competing effects. When included as a single measure, as in Model 3, the tax exemption does not exert a significant influence on the independence decision.

As described earlier, Model 4 splits the exemption into two components. First, the average exemption is the same for all households in a given year, but differs across years. This change represents the exogenous changes in the exemption value over time due either to inflation or to statutory changes in the tax code. The second variable is the difference between the parents' value in a given year and the average for all households. This variable captures differences in the marginal tax rate across households which are due primarily to differences in labor supply, income, and household composition. As can be seen in Models 4 and 5, for both males and females the average exemption (the time-series component) has a small, positive effect on independence that is significant at the 11% and 5% level for females and at the 12% level for males. When the parents' relative benefit is held constant, the average tax exemption is effectively an addition to the child's resources; this positive effect clearly outweighs the negative influence that is channeled through the benefit to the parents. If we include interaction terms be-

tween the average exemption and child's age (not shown), we find that the exemption has a larger impact on children under age 21 than on those 21 and over. The size of the benefit to the parents, relative to the norm, however, has no measurable impact.

In Model 5 we add another set of public policy variables that offer potential financial assistance to the parent and the child. For females, we include two AFDC measures as explanatory variables. The first is the state-specific maximum guarantee for a two-person household. Although we would expect this to have a positive effect on independence, we find that AFDC has a significant negative effect. The second welfare measure is an interaction between the value of the AFDC benefit, a dummy variable equal to 1 for children age 17 or younger, and a dummy variable for low parental income. We include this term to capture the incentive to parents to keep eligible children dependent, so that the parents can continue receiving the welfare benefit. This second term is applicable to both males and females, but is significant only for females. Moffitt (1992) points out that the findings on the impact of AFDC benefits on household formation and structure have been mixed. Haurin et al. (1993) make the same point in explaining the insignificant effect of AFDC on coresidence in their models.

Overall our results with respect to the AFDC measures are puzzling, but likely are due to the complicated paths through which AFDC affects coresidence. As we mentioned earlier, for instance, AFDC often can be received even if the recipient is living in her parental home. Most important, AFDC receipt requires at least one birth. Young women with children and no spouse may be more likely to live at home, especially if the payment does not change with parental residence.

In all versions of the model we include three additional variables that capture financial aspects of the independence decision. The first is the cost of rental housing. This was a primary focus of the work by Haurin et al. (1993); they found that rental housing costs decrease the probability of a child's living outside the parental home. We find no significant effect for males or females. We use a regional measure of rental costs, however, rather than the much more fully disaggregated measure that Haurin et al. employ for the single year of data they analyze, because we do not have a comparable cross-year, cross-state measure of rental costs. We also find no evidence that either higher state unemployment rates or the state's deviation from the national unemployment rate significantly affect the probability of establishing independence.

We include two measures of family structure. The first is a dummy variable equal to 1 if the child lived with both of his or her biological or adoptive parents at age 14. With one

exception (males, Model 1), this variable is never significant.¹⁹ We also include a measure of family size, defined as the number of members currently residing with the family unit, we find that this has a strong effect on the probability of males' establishing independence, but generally is not a significant determinant of independence for females.

Because our data span 20 years, we explore the cohort trend in the transition to independence. Using the results from a simpler specification (available from the authors on request) that includes only main cohort effects and constrains the age-cohort interactions to be 0, we find that the probability of establishing independence begins to decline for female cohorts born after 1960 and for male cohorts born after 1959.

CONCLUSIONS

The age of establishing independence varies considerably. Previous studies concentrated largely on the impact of family structure and parent-child relationships on homeleaving or focused on the time or mode of departure from the parental home. Our paper explores a topic that has received much less attention: how economic variables affect the establishment of both financial and residential independence. Our results show that economic factors play an important role.

One critical economic variable is the child's potential earnings. Many of the estimated relationships between independence and the other variables change in magnitude or direction of influence when we include the child's wage opportunity. Our results are also consistent with those of Haurin et al. (1993), who find that potential wages are an important predictor of household formation. The coefficients on the wage are larger for males than for females, an indication that own financial resources are a stronger determinant of independence for men than for women. Average hourly real wages climbed in the late 1960s and early 1970s, but in 1974 they began a generally downward trend that persisted through the 1980s and into the current decade (Bureau of Labor Statistics 1994). Therefore, young people's decreasing wage opportunities may be one explanation for the recently noted increase in the age of homeleaving.

Parental resources also play an important role in the independence decision. Higher parental income reduces the probability that a child will become independent. As the child ages, however, the deterrent effect of parental income declines. After age 18–19, higher parental income increases the probability of independence. This result is consistent with

the idea that parents prefer younger children to remain dependent, and that parents with higher income can elicit the desired behavior. In contrast to own financial resources, the coefficients on parental resources and especially the deterrent effect of income at young ages are larger for females than for males.

A political push is under way to introduce a comprehensive family policy in the United States. This movement focuses primarily on bringing more income to families through increased dependency exemptions or credits, or direct child allowances. In this paper we provide some evidence that these subsidies may increase the resources available to the child and thus may encourage the establishment of independence.

APPENDIX TABLE A1. OLS ESTIMATES OF LOG OF CHILD'S WAGE, BY GENDER (ABSOLUTE VALUE OF T-STATISTIC IN PARENTHESES)

Variable	Males	Females
State Unemployment Rate	-.002 (0.83)	.001 (0.33)
Log of Minimum Wage	.094 (0.46)	.344 (1.61)
Age	.795*** (5.03)	.507*** (3.18)
Age Squared	-.027*** (3.85)	-.018*** (2.54)
Age Cubed	.0003*** (3.24)	.0002** (2.14)
Age × Birth Year	-.001*** (2.99)	5.8E-06 (0.02)
Head: 1–11 Years of School	-.060 (0.40)	.017 (0.10)
Head: High School Graduate	.053 (0.37)	-.209 (1.31)
Head: College	-.106 (0.57)	-.038 (0.18)
Head: Graduate School	-.029 (0.13)	-.652*** (2.97)
Head: Education Missing	.054 (1.12)	-.063 (1.20)
Age × 1–11 Years of School	.007 (1.03)	-.001 (0.07)
Age × High School	.003 (0.44)	.013* (1.72)

(continued on next page)

19. In other regressions (not shown) we included a time-varying indicator of parental marital disruption. This variable also had no significant effect on the probability of leaving home. For a more comprehensive study of the effect of family structure on homeleaving, see Aquilino (1991).

(Appendix Table A1 continued from previous page)

Age × College	.011 (1.34)	.007 (0.75)
Age × Graduate School	.011 (0.43)	.032*** (3.20)
White	.111*** (3.17)	.126*** (3.55)
Rural	-.134*** (6.42)	-.165*** (6.91)
South	.083*** (2.95)	-.091*** (3.16)
Northeast	.061** (2.17)	-.003 (0.09)
North Central	.047 (1.79)	-.082*** (2.84)
Mother Working at (Child's) Age 14	.032' (1.66)	-.010 (0.48)
Head Is an Immigrant	.055 (1.11)	.030 (0.54)
Intercept	-5.372*** (4.50)	-3.682*** (3.05)
R ²	.316	.246

* $p \leq .10$; ** $p \leq .05$; *** $p \leq .01$

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