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Older Women: Pushed into Retirement by the Baby Boomers?

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ABSTRACT

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Older women's patterns of labor supply over the past forty years have differed markedly from those of younger women. Their labor force participation declined sharply during a period of rapid increase for younger women, and then increased significantly while younger women's plateaued and even declined. But there has been an apparent correspondence between the pattern of retirement among women aged 55-69, and the proportion of workers aged 25-34 working part-year and/or part-time. The latter was an effect of overcrowding among the baby boomers as they moved through the labor market. The former is hypothesized here to be a function of the increasing difficulty older women experienced in obtaining "bridge jobs" – part-year and/or part-time – between career and retirement. It has been demonstrated in earlier studies that older women – especially those in lower-wage jobs – often seek such bridge jobs before retirement. And in many cases these bridge jobs are not in the same industry or even occupation as the career job, leading one to suspect that in many cases there might be little transfer of skill or human capital. If this is the case, then the older workers would at least to some extent be in direct competition with younger workers for these jobs. Given difficulty in finding bridge jobs, a higher proportion of older workers might choose to enter retirement directly from career jobs, skipping the bridge jobs. A relative cohort size measure – the number of 25-34 year old women working part-year and/or part-time, relative to the number of older women, at the state level – has been shown here to be highly significant – both statistically and substantively – in explaining changes in older women's annual hours worked, labor force participation, and propensity to retire. In general terms, relative cohort size can be said to have generated between 15-30% of the observed changes in these variables, with the strongest effects being on the propensity to claim Social Security benefits. Somewhat stronger effects were found for older men, in a companion to this study.

JEL Classification: J14, J21, J22, J26

Keywords: retirement, women's labor supply, labor force participation, relative cohort size, relative wage, part-time employment, bridge jobs, baby boom

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The labor force participation of older women in the U.S. – like that of younger women – has changed dramatically over the past forty years, but the patterns in the two groups differ markedly. While the participation of younger (married) women increased dramatically in the 1970s and early 1980s, and then began to level off, the participation of older women actually declined marginally between 1970 and 1985, and only then began a marked and steady increase which has not yet abated. Their hours worked declined quite markedly between 1970 and 1985, before increasing steeply. The labor force participation patterns for three older age groups are shown in Figures 1-3. The average annual hours worked (including zeroes) for women aged 55-61 decreased from 889 in 1970 to 866 in 1985 and then increased to 1,243 in 2009, while that for the 62-64 age group declined from 640 in 1970 to 526 in 1985 and then increased to 796. For women aged 65-69 the pattern was 325, 198 and 419.

Also shown in Figures 1-3 are retirement patterns: the proportion reporting themselves as retired when questioned about why they hadn't worked in the previous year, and the proportion claiming Social Security benefits. The latter is nearly the inverse of hours worked, for the two older age groups – increasing dramatically in the early period and then declining, very markedly for those aged 62-64, after 1980-1985. The proportion reporting themselves as retired increased until the mid-1990s, and then began to decline.

The bottom left in each of Figures 1-3 presents the relative hourly wage of these older women. The relative wage for each age group is defined here as the average wage of part-year part-time workers relative to the average full-time wage of the previous five year age group. That is, the assumption is that a worker, in deciding whether to take a bridge job at, say, age 55-59, will compare the wage that she could earn in that bridge job, relative to the wage she has been earning in a full-time career job, at age 50-54. In all three cases we see a sharp decline in this measure prior to 1980, with some increase – dramatic in the case of the middle age group – in the period after 1980.

The purpose of this paper is to examine these trends from 1968-2009, attempting to find some explanation for the distinctive patterns displayed in Figures 1-3. A companion paper does the same for older men (Macunovich, 2009).

Despite a voluminous literature on older men's patterns of labor force participation and retirement, there appear to be only a few that look specifically at older women, and a few more that look at both men and women. A frequent topic addressed in this literature is the effect of Social Security earnings tests on labor force participation (Gruber and Orszag, 2003; Reimers and Honig, 1996; Honig, 1998; Rubb, 2002).

Workers have historically had their Social Security benefits reduced by current earnings. Although they are later compensated for this reduction, it is usually viewed by workers as a tax on earnings, and therefore hypothesized to affect labor force participation among those aged 65 and above. The threshold above which earnings result in a reduction in Social Security benefits was removed in 2000 for those aged 65-69. In addition, legislation passed in 1983 caused the delayed retirement credit to increase between 1990 and 2008, allowing benefits to increase up to age 70 for every additional year benefits are delayed.

The evidence on women's response to these economic incentives varies. Reimers and Honig (1996) found men highly responsive to the earnings test, but not women, and predicted that older women's labor force participation would have been increased by the delayed retirement credit, but not reduced by the earnings test. Rubb, as well, found little effect of the earnings test on women' labor supply. Gruber and Orszag, however, found opposite results, with little or no significant effect of the earnings test among men, but some evidence of an effect for women. And Honig (1998), looking specifically at married women, found them responsive to their own pension wealth, and to a lesser extent, to Social Security benefits. Responsiveness to the Social Security delayed retirement credit, taken together with the increased and then eliminated earnings test threshold might, to some extent, be expected to have contributed to the patterns observed in Figure 1 for women aged 65-69, but the same cannot necessarily be said for women under 65, whose patterns so closely echo those of the older age group.

Another topic, which has been addressed in the literature primarily with respect to older men, is the focus of this study: the increasing prevalence of "bridge" employment among older workers. That is, the tendency to exit career full time jobs not directly into retirement, but rather into various forms of part-time work. Although the bulk of the literature looks at this issue in terms of men's retirement patterns, Peracchi and Welch (1994) looked at transitions for both men and women, and found an increasing trend toward moves from full time to part-time work, for women as well as men. And, looking at Canadian women, Schellenberg, Turcotte and Ram (2005) found that one-half of women who had retired from full time jobs later returned to part-time jobs. Similarly, Honig(1985) – following on work in Hanoch and Honig (1985) for men – found that "partial retirement" in the form of bridge jobs constitutes a significant factor in women's employment patterns. And Hill (2002) found the tendency toward part time work increases with age among older women. Thus the concept of bridge jobs, and re-entry into part-time jobs, might be hypothesized to apply to women as well as men. As a result, the following is a brief review of the findings in the literature on male labor force transitions.

Ruhm (1990) was perhaps the first to identify (and name) this phenomenon. He found that fewer than 40% of household heads retire directly from career jobs, and over half partially retire at some point in their lives. He also stressed that this post-career work is frequently in jobs outside the industry and occupation of the career position. This may have changed, to some extent, in more recent years, however: Giandrea, Cahill and Quinn (2008a) suggest that transition within occupations may be more frequent – in particular in moving to self employment. And the same authors (2008b) found that younger cohorts seem to be following the same patterns as older cohorts. Peracchi and Welch (1994) found that the prevalence of reduced participation was greatest among low-wage workers, and that the patterns of decreased participation among older workers paralleled those among younger workers during the 1970s and 1980s.

This suggests some common underlying factor or factors affecting both older and younger workers – at least among those in low-wage jobs.

Ruhm, in a later study (1995), used data from the Retirement History Survey to study men in 1969, and from the HARRIS survey (commissioned by the Commonwealth Fund) to study men in 1989. In the earlier cohort he found that 62% who had left career jobs at age 54 or 55 were employed again at the later survey date – but in the later cohort this figure dropped to 41%. He found that early departures from career jobs – at ages 58 to 63 – correlate with high re-employment probabilities. Quinn (1998, 1999) and a more recent study – Cahill, Giandrea and Quinn (2008) – referred to this phenomenon as a "do-it-yourself" form of retirement. Using the Health and Retirement Study Cahill et al. found that two-thirds of younger retirees transition to part-time work from career jobs.

Approach

As in the companion to this paper, for older men (Macunovich 2009), the approach in the current study builds on this concept of "bridge jobs", especially the findings that

- the majority of these bridge jobs are not in the same industry or occupation as the career job (Ruhm 1990), leading one to surmise that there is little transfer of skill or human capital from the career job to bridge job;
- the characteristics most highly correlated with the transition to bridge jobs are those associated with low-wage workers (Welch and Peracchi 1994), which again suggests lower levels of skill or human capital;
- the proportion of workers transitioning to bridge jobs declined significantly between 1969 and 1989 – a period when retirement rates were rising and labor force participation rates were falling, suggesting that access to bridge jobs may have declined during this period;
- the patterns of transitions among older workers paralleled that among younger workers in the 1970s and 1980s (Welch and Peracchi 1994).

These findings lead to the hypothesis that there may be a high level of competition and substitutability between older and younger workers for the types of part-time jobs typical of "bridge jobs", and that some common factor affected both older and younger workers in an increasing pattern during the 1970s and 1980s, which then attenuated in the 1990s and 2000s.

The "culprit" identified in this study – the common factor affecting both younger and older workers – is the post WWII baby boom. Their large relative cohort size – typified in a lagged Total Fertility Rate (TFR) – affected relative wages, unemployment, and the proportion of younger workers in part-time and/or part-year jobs, due to overcrowding in the cohort (demonstrated for young men by Macunovich 1999, 2002). The relative cohort size measure used here for older women is consequently the ratio of 25-34 year old women working part-time and/or part-year, to the number of women aged 55-69, and it is instrumented (given the possibility of endogeneity in the contemporaneous relative cohort size variable) using a 30-year lag of the Total Fertility Rate.

The rationale behind these measures is that older women are using part-time and part-year jobs as "bridge jobs" prior to retirement, and because there is little transfer of human capital from career jobs they are at least to some extent competing with younger women for these jobs. To the extent that they find it difficult to find such jobs, they will be more likely to skip the "bridge jobs" and move directly into full retirement – or, alternatively, they will be less likely to re-enter the labor force after retirement.

The lower right graph in Figures 1-3 illustrates the pattern of this relative cohort size variable for older women, with its sharp rise prior to 1980, and equally sharp decline after 1995. Superimposed on this pattern is a 30-year lag of the Total Fertility Rate: the earlier pattern of births which produced the large cohort with its overcrowding and high proportions working part-year and/or part-time.

Data and Methodology

The data used in these analyses has been drawn exclusively from the March Current Population Survey (CPS) 1968-2009, as prepared in uniform files in *CPS Utilities* by Unicon. Data covered all women aged 25-34, and those aged 55-69, with the 25-34 age group used for the numerator of a relative cohort size variable, and all women aged 55-69 for the remainder of the analyses[1].

The methodology employed is that of a typical labor supply model, but with relative cohort size variables added. The relative cohort size variable used was calculated as the number of 25-34 year old women working part-year and/or part-time, relative to the number of women aged 65-69 in each year and state[2]. Age-specific unemployment rates were calculated for each of the three age groups – 55-61, 62-64 and 65-69 – calculated at the Metropolitan Statistical Area (MSA) level[3], and regressions were run using individual-level micro data with these state- and MSA-level variables attached to each record. In addition, each age-group's model was also tested with a 30-year lag of the Total Fertility Rate, as an instrument for the relative cohort size measure. Summary statistics describing the data are presented in Appendix Tables A1-A3.

Four models were estimated, for four labor supply indicators, separately for each of the three age groups:

$$H = \beta_0 + \beta_1 \ln W + \beta_2 I_e + \beta_3 I_o + \beta_4 RCS_{State} + \beta_5 U_{MSA} + \beta_6 M + \mathrm{B}'X + u \qquad (1)$$

$$OLF = \gamma_0 + \gamma_1 \ln W + \gamma_2 I_e + \gamma_3 I_o + \gamma_4 RCS_{State} + \gamma_5 U_{MSA} + \gamma_6 M + \Gamma' X + u \qquad (2)$$

$$R = \alpha_0 + \alpha_1 \ln W + \alpha_2 I_e + \alpha_3 I_o + \alpha_4 RCS_{State} + \alpha_5 U_{MSA} + \alpha_6 M + \mathrm{A}' X + u \qquad (3)$$

$$R_{SS} = \delta_0 + \delta_1 \ln W + \delta_2 I_e + \delta_3 I_o + \delta_4 RCS_{State} + \delta_5 U_{MSA} + \delta_6 M + \Delta' X + u \qquad (4)$$

Where

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[1] Those in the military were excluded from the analysis, however.

[2] There were 51 separate states (and DC) identified from 1977-2009, 22 from 1973-1976, and 30 from 1968-1972.

[3] MSA was not available prior to 1977, so state-level variables were used, specific to each age group, for those years. After 2004, BLS changed from MSAs to Consolidated Statistical Areas (CSA). The resulting number of levels used in each year was 1969-76: 21, 1977-85:45, 1986-2004:248, 2005:281 and 2006-09:265. For those not living in an MSA, the state-level variable was used.

H represents annual hours worked in the previous year (including those with zeroes);

OLF represents a binary variable set to one for those out of the labor force;

R represents a binary variable set to one for those identifying themselves as retired;

R_{SS} represents a binary variable set to one for those receiving Social Security benefits;

W represents the woman's own (instrumented) hourly wage, in constant 2008 dollars;

I_e represents the earnings of others in the family, defined as total family earnings minus own earnings, again in constant 2008 dollars;

I_o represents other income, which comprises interest, dividends, and rent, in 2008 dollars;

RCS_{State} represents the age- and state-specific relative cohort size;

U_{MSA} represents the age- and MSA-specific unemployment rate, in the year prior to the survey;

M represents a binary variable set to one for those who are married with spouse present; and

X is a vector of control variables.

The control variables included single year age dummies, four education dummies (with 16 years as reference group), three race dummies (with non-Hispanic white as reference group), twenty state dummies[4], a time trend, and three indicators of MSA status (principal city, balance of MSA, and non-MSA).

In addition, each of models (1)-(4) was estimated for each age group substituting a 30-year lag of the Total Fertility Rate for the relative cohort size variable. And finally, the models for those aged 65-69 were tested with controls for the major changes in Social Security which occurred during the study period: a dummy for the years after 1990, the period in which the delayed retirement credit was

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[4] Twenty-one state groupings were consistently available over all forty-two years.

increased, and another for the period after 2000, when the Senior Citizens' Freedom to Work Act was passed.

The methodology comprised three steps. In the first, hourly wages were calculated – in 2008 dollars using the Consumer Price Index – as total annual wages and salary in the previous year divided by annual hours worked, with the latter calculated as weeks worked times the usual number of hours worked per week in the previous year[5]. The annual wages and salary were first multiplied by a factor if 1.45 if topcoded, as in Blau and Kahn (2007). The hourly wage was imputed for those with no reported wage, the self-employed, and those whose calculated wage fell outside the range $2.50 – $250 in 2008 dollars. The imputation process was based on separate logwage regressions for those with less than 20 weeks worked and those with 20 or more weeks worked, separately for each age group. That is, it was assumed, as in, for example, Blau and Kahn (2007), that wages should be imputed based on the reported wage of those in groups with similar numbers of weeks worked.

The imputation regressions were run separately in each of 14 three-year groupings. Three-year groupings were used to achieve larger sample sizes for the imputation process, and March Supplement weights were normalized to sum to one in each year, so that each year carried equal weight in the regressions. The regressions each included four age dummies, two year dummies, four education dummies, three race dummies, twenty state dummies, and three indicators of MSA status.

In the second step, treating own wages as endogenous, wages were instrumented – again separately for each age group and time period – by regressing logwage on four age dummies, four education dummies, three race dummies, twenty state dummies, and three indicators of MSA status. In addition, following on

[5] Since the variable "hours worked per week in the previous year" was not available prior to 1976, and weeks worked in the previous year was available only in groupings, an imputation algorithm developed by Finis Welch (1979) was used to allocate hours and weeks worked for these years. Details available on request from the author.

Blau and Kahn (2007), a series of dummy variables representing wage deciles was included, which served as excluded instruments in the final hours, participation, and retirement equations. As indicated in Blau and Kahn, use of the deciles "corrects to some degree for measurement error in the wage" (p. 406).

The third step involved estimating each of the equations in (1) - (4), separately for each age group, over the entire 42-year period. Equation (1) was treated as a weighted IV linear model, while (2), (3) and (4) were weighted IV binary probit models.

Results

The results of this procedure are presented in Tables 1 – 4, for each of the three age groups, 55-61, 62-64 and 65-69. The top half of each table presents results using the lagged Total Fertility Rate (TFR), and the bottom half presents results using the state-level relative cohort size variable (RCS). Table 1 presents results for annual hours worked, Table 2 for the propensity to be out of the labor force, and Table 4 for the propensity to claim Social Security benefits. Table 3 presents results of the probit regressions for the binary variable "retired". This is a self-reported variable, and is derivative in the CPS. That is, the CPS is not designed specifically to elicit statistics on retirement; rather, retirement is a reason that can be given for not having worked in the previous year.

In all cases, the coefficients on the relative cohort size and Total Fertility Rate variables display the expected signs and all are highly significant. The variables have a strong negative effect on hours worked, and positive effects on the proportions out of the labor force, retired, and claiming Social Security benefits. This is consistent with the hypothesis that overcrowding in the market for part-year and part-time jobs induces older women to reduce their labor force participation: the competition for part-year and/or part-time jobs leads women to skip bridge jobs and move directly out of the labor force from career jobs.

The strength of the estimated effects varies across age groups and across the four variables. The estimated elasticities are strongest for the likelihood of reporting oneself as retired: .9-1.0 for TFR and .3-.4 for RCS. This is similar to the case for men, in the companion paper. Next strongest, for the 65-69 age group, is the effect on hours worked, with elasticities of -.4(RCS) and -.6(TFR) before Social Security controls, and -.2 and -.5 after. For men, this was an even stronger area, with elasticities of .4-.7. For women aged 62-64, the next strongest area is in the likelihood of claiming Social Security benefits, with elasticities of .2 to .4. The weakest estimated elasticities for women generally were for labor force participation.

Adding controls for the changes in Social Security in the 65-69 age group reduces the estimated effect of the relative cohort size variable, but the coefficients remain highly statistically significant. As with men, in the case of claiming Social Security benefits, the estimated effect of the Total Fertility Rate is actually increased when these controls are added.

When combined with the Total Fertility Rate, the estimated effect of the delayed retirement benefit on the 65-69 age group is only statistically significant in the case of the two retirement variables, and even then the results are mixed, with a positive estimated effect on the propensity to call oneself retired. When combined with the relative cohort size variable, however, it is significant, with the expected signs – positive on hours worked, and negative on the other three variables – but except for the propensity to claim Social Security benefits, its statistical significance is small. The estimated negative effect on the propensity to claim Social Security benefits is very strong, however. This accords with the findings of Reimer and Honig (1996). For men, too, in the companion paper, the delayed retirement benefit was not significant when combined with the Total Fertility Rate, but was significant with the expected signs when combined with the relative cohort size variable.

The Freedom to Work Act has a more mixed effect. As for men, it has a significant positive effect on hours worked, and a negative effect on being out of the labor force or thinking of oneself as retired (although when combined with the Total Fertility Rate its effect was not statistically significant for "out of the labor force"). But again as for men its effect in terms of claiming Social Security benefits is mixed: barely significant and positive when combined with the TFR, but significant and negative in combination with the RCS.

In terms of own-wage elaticities, the results in Tables 1-4 show a marked difference across age groups, similar to the differences estimated for older women. For proportions out of the labor force, and proportions reporting themselves retired, the coefficient on the logwage is either not statistically significant for the 62-64 age group, or just barely significant. But the coefficient on the logwage differs in sign between the other two age groups. For hours worked, the effect is positive for those aged 55-61, but negative for those aged 65-69: the income effect dominates in the older age group. Correspondingly, for being out of the labor force or retired, the effect is negative for those aged 55-61 and positive for those aged 65-69. In terms of claiming Social Security benefits, however, the effect of the logwage is strongly negative for both of the older age groups, as for men.

The estimated effect of marriage on older women is almost the opposite of that estimated for men in the companion paper: negative on hours worked, and positive on being out of the labor force or thinking of oneself as retired. But as with older men, in terms of claiming Social Security benefits, the estimated effect of marriage is negative for both of the older age groups. In terms of "others' earnings", however, (presumably in most cases the husband's), the estimated effects on women are the same as for men – positive on hours worked and negative on the other three variables – except for women aged 55-61, where the effect of others' earnings is negative on hours worked and positive on the likelihood of being out of the labor force.

Other income – interest, rent, and dividends – has a significant negative effect for women on hours worked, and a significant negative effect on the other three variables. The signs of these effects are the same as for older men, but for them, in the 65-69 age group the effects are only significant for the two retirement variables.

The effect of the time trend is negative on hours worked only for women aged 62-64, and negative for all three age groups in terms of being out of the labor force – but positive in terms of the two retirement variables. For older men the trend was negative on hours worked, and positive on the other three variables, in all cases.

Table 5 is an attempt to estimate the significance of the relative cohort size variables in terms of the percentage of observed change that might be attributed to them. The table provides estimates of the maximum change which might be generated in the dependent variable, given the estimated elasticity and the maximum observed percentage change in the independent variable, from its mean. In each case, that estimated change is then calculated as a percentage of the maximum change from the mean that was observed in the dependent variable. On this basis, in general terms it can be said that the lagged Total Fertility Rate would have generated an average of about 30%, and the Relative Cohort Size generated about 15%, of the observed change in the dependent variables: hours worked, and the probability of being out of the labor force, retired, and/or claiming Social Security benefits. These effects are somewhat smaller than for older men. For women aged 62-64, however – comparable to men of that age – the effects are much stronger in terms of the propensity to claim Social Security benefits: 80% and 45%.

Summary

The post WWII baby boom began entering the labor market in the late 1960s, and their numbers swelled through the 1970s and into the 1980s. Their large size, relative to the size of the cohort of prime-aged workers, forced a whole host of dislocations for them: high unemployment, low relative wages, and increasing proportions forced into part-time and part-year work (Macunovich 1999, 2002). The peak of the baby boom had entered the labor force by 1985, but the dislocations did not end there, since the bottleneck created by those in the peak continued to block those following. Members of the baby boom did not escape the effects of their cohort's large size even in their thirties, as a result, and even members of the relatively smaller cohorts following the peak of the boom continued to find themselves pushed into part-time and part-year work. However, as relative cohort size eased in the 1990s, many of these effects began to ease, as well. In particular, the proportion of women aged 20-29 working part-year and/or part-time fell from 0.44 in 1980 to 0.34 in 2008 – comparable to its level before the entry of the baby boom into the job market. For women aged 30-39, that ratio fell from its high of 0.36 in 1982 to 0.26 in 2008 – lower than its level before the baby boom entered the market.

At the same time that this was happening, the retirement rate rose fairly dramatically in the 1970s and 1980s among women aged 55 and above, and their labor force participation rates fell accordingly. The proportions claiming Social Security benefits rose from 1968 levels of 0.40 and 0.65 for those aged 62-64 and 65-69, respectively, to highs of 0.60 and 0.90 in the late 1980s, but then declined to 0.43 and 0.78, respectively, in 2009.

Evidence suggests that the correspondence between these two phenomena – with strong increases in the period before 1985 and declines after 1995 – is not coincidental. It has been demonstrated in a number of studies that to a great extent older workerss do not retire directly from their career jobs. Instead, they tend to move through part-time and/or part-year "bridge jobs" before retiring – especially those in lower wage jobs. And very often these bridge jobs do not occur in the same industry or even the same occupation as the career job, suggesting a fairly low level of transference of skills and human capital. Thus to some extent, at least, these older workers may have been competing for the same part-time, part-year jobs that the baby boomers were crowded into. Older women's relative wages in these jobs – defined as the wage they could earn in a part-time and/or part-year job relative to the wage they were earning in a full-time full-year job – fell from about 1.30 in the mid-1960s to only about 0.95 in the mid-1980s. For those age 62-69 it then rose to over 1.20 in this past decade, as baby boomers moved on and the job market for part-year part-time jobs eased (shown in Figures 1- 3).

As a result, this study has made use of a measure of relative cohort size – the number of 25-34 year old women working part-year and/or part-time, relative to the number of women aged 55-69. The measure was calculated, using March Current Population Survey (CPS) data, for each woman at the level of her state for purposes of analysis. This relative cohort size measure might be thought of as a direct function of a 30-year lag of the Total Fertility Rate, a measure often used to illustrate the effects of the post WWII baby boom, as shown in the bottom right of Figures 1-3.

More importantly this measure has been shown here to be a highly significant factor – both statistically and substantively – affecting older women's annual hours worked, labor force participation and propensity to retire and claim Social Security benefits.

However, a significant portion of the sharp decline in annual hours worked, for women aged 62-69, and increases in retirement, in the 1970s remains unexplained, indicating the considerable role played by the other factors which have been identified as important in affecting older women's decision to retire: access to health insurance, and changes in Social Security and pensions.

We have begun to experience the entry of the "echo boom" into the labor market, and one might initially expect that this would once again tend to motivate older workers to retire at higher rates, as the echo boom moves into its twenties and thirties. However, the ratio of these young workers, to older workers, will remain low since the older workers will themselves be members of the large baby boom cohort – so it remains to be seen whether it is the absolute or the relative size of the younger cohort which is significant in affecting patterns in the older cohort – or whether the large size of the retiring cohort itself may affect its labor force participation patterns. Any attempt to tease out the effects will have to differentiate them from the effects of the recent recession and diminution of 401Ks.

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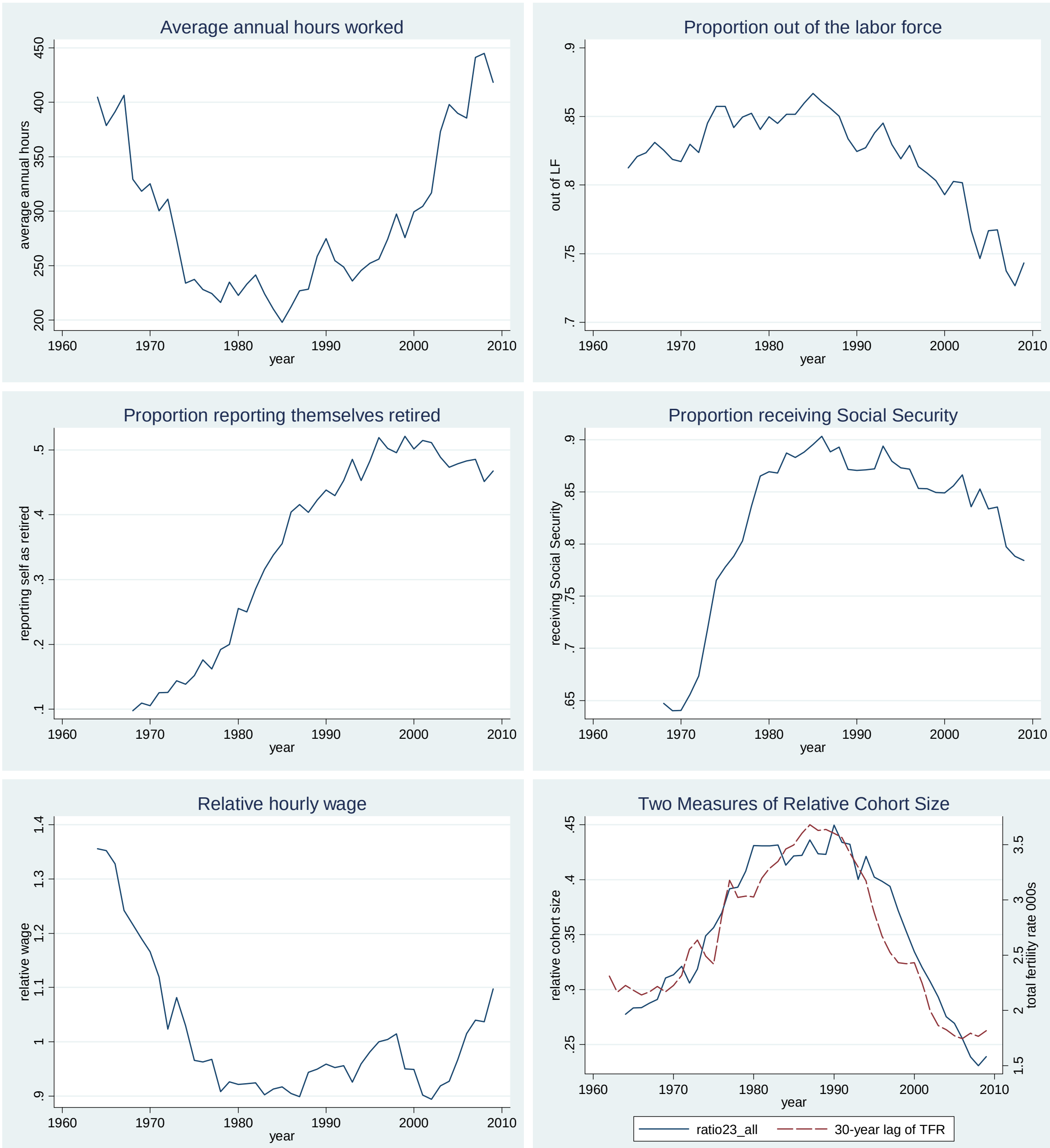
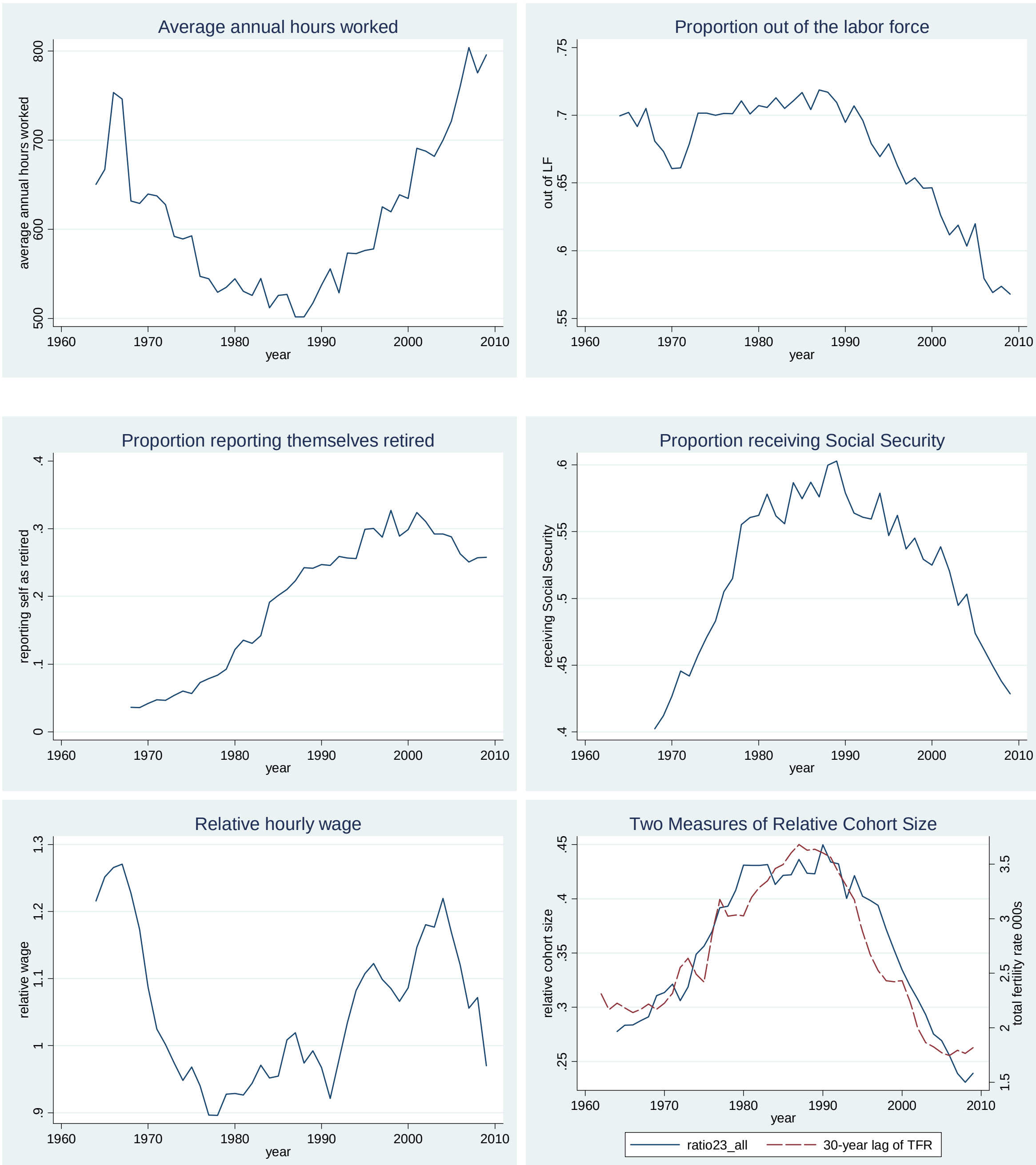
Figure 1: Labor Force and Retirement Characteristics of Women Aged 65-69



The relative wage is defined here as the average wage of part-year part-time workers relative to the average full-time wage of the previous five year age group. That is, the assumption is that a worker, in deciding whether to take a bridge job at age 65-69, will compare the wage that she could earn in that bridge job, relative to the wage she has been earning in a full-time career job, at age 60-64.

Relative cohort size is defined as the number of women aged 25-34 working part-year and/or part-time, relative to the number of women aged 55-69.

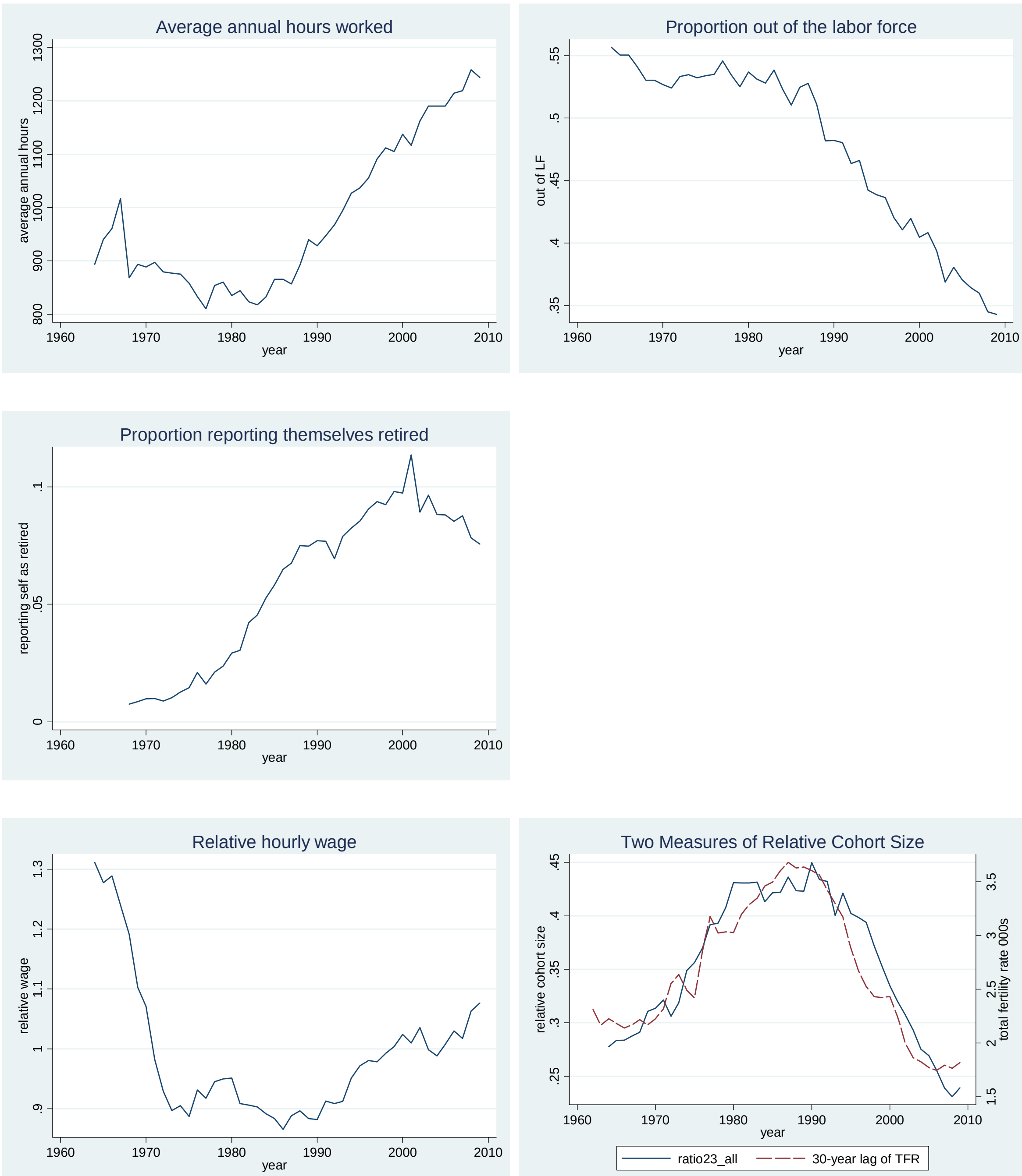
Figure 2: Labor Force and Retirement Characteristics of Women Aged 62-64



The relative wage is defined here as the average wage of part-year part-time workers relative to the average full-time wage of the previous five year age group. That is, the assumption is that a worker, in deciding whether to take a bridge job at age 60-64, will compare the wage that she could earn in that bridge job, relative to the wage she has been earning in a full-time career job, at age 55-59.

Relative cohort size is defined as the number of women aged 25-34 working part-year and/or part-time, relative to the number of women aged 55-69.

Figure 3: Labor Force and Retirement Characteristics of Women Aged 55-61



The relative wage is defined here as the average wage of part-year part-time workers relative to the average full-time wage of the previous five year age group. That is, the assumption is that a worker, in deciding whether to take a bridge job at age 55-59, will compare the wage that she could earn in that bridge job, relative to the wage she has been earning in a full-time career job, at age 50-54.

Relative cohort size is defined as the number of women aged 25-34 working part-year and/or part-time, relative to the number of women aged 55-69.

Table 1: IV Regression Results for Annual Hours Worked (including zeroes)

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Lagged Total Fertility Rate (000s)	**-66.2**	**-74.6**	**-65.0**	**-52.8**
	(-17.4)	**(-13.5)**	**(-19.3)**	**(-9.1)**
Logwage[1]	341.4	65.9	-58.5	-59.0
	(59.6)	(9.0)	(-14.4)	(-14.5)
Others' earnings[2] (000s)	-0.4	1.0	1.4	1.4
	(-7.3)	(11.3)	(17.2)	(17.2)
Other income[3] (000s)	-3.1	-2.1	-1.1	-1.1
	(-20.2)	(-10.8)	(-10.3)	(-10.3)
Married?	-310.5	-283.6	-165.1	-165.1
	(-59.5)	(-39.3)	(-40.6)	(-40.7)
Time Trend	0.7	-1.5	0.4	0.1
	(3.3)	(-4.6)	(2.1)	(0.2)
Delayed Retire. Benefit?				-11.4
				(-1.2)
Freedom to Work Act?				40.6
				(3.4)
Adjusted R-square	0.1144	0.0751	0.0604	0.0607
TFR elasticity	**-.185**	**-.339**	**-.636**	**-.516**

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Relative cohort size (state-year-specific)	**-262.1**	**-319.4**	**-325.8**	**-161.5**
	(-10.9)	**(-9.0)**	**(-14.7)**	**(-6.3)**
Logwage[1]	341.3	64.7	-53.7	-58.0
	(59.5)	(8.9)	(-13.4)	(-14.3)
Others' earnings[2] (000s)	-0.3	1.0	1.4	1.4
	(-7.0)	(11.6)	(17.5)	(17.3)
Other income[3] (000s)	-3.2	-2.4	-1.3	-1.2
	(-21.1)	(-11.5)	(-11.6)	(-10.6)
Married?	-311.9	-284.5	-165.6	-165.3
	(-59.7)	(-39.3)	(-40.7)	(-40.7)
Time Trend	1.5	-0.7	1.3	-1.8
	(7.0)	(-2.1)	(6.5)	(-4.5)
Delayed Retire. Benefit?				27.4
				(3.7)
Freedom to Work Act?				95.6
				(11.2)
Adjusted R-square	0.1136	0.0737	0.0589	0.0602
Number of Observations	227,907	85,173	130,084	130,084
RCS elasticity	**-.095**	**-.189**	**-.414**	**-.215**

* Reporting hours worked for years 1967-2008.
t-statistics in parentheses.
All regressions included 20 dummies for state groupings, age dummies, 4 education dummies, 3 race dummies, an MSA-specific unemployment rate, and 3 indicators of MSA residency status.
[1]Logwage is imputed for those reporting no wage, and instrumented for all.
[2]Defined as total family earnings minus own earnings
[3]Comprising interest, dividends and rent

Table 2: IV Binary Probit Results for "Out of the Labor Force"

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Lagged Total Fertility Rate (000s)	**.024** **(11.4)**	**.033** **(10.7)**	**.029** **(14.6)**	**.027** **(7.7)**
Logwage[1]	-.143 (-45.9)	-.003 (-0.8)	.042 (17.4)	.042 (17.5)
Others' earnings (000s)[2]	.0001 (4.1)	-.0006 (-13.7)	-.0007 (-19.7)	.-0007 (-19.8)
Other income (000s)[3]	.001 (16.8)	.001 (8.8)	.0006 (7.3)	.0006 (7.3)
Married?	.145 (52.2)	.148 (37.8)	.097 (40.2)	.097 (40.2)
Time Trend	-.001 (-8.5)	-.001 (-2.1)	-.001 (-8.2)	-.001 (-3.0)
Delayed Retire. Benefit?				.003 (0.5)
Freedom to Work Act?				-.007 (-1.0)
Pseudo R-square	0.0712	0.0507	0.0540	0.0540
TFR elasticity	**.139**	**.134**	**.096**	**.090**

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Relative cohort size (state-year-specific)	**.084** **(6.5)**	**.109** **(5.5)**	**.140** **(10.4)**	**.073** **(4.7)**
Logwage[1]	-.143 (-45.9)	-.003 (-0.8)	.040 (16.7)	.042 (17.2)
Others' earnings (000s)[2]	.0001 (3.9)	-.0006 (-13.9)	-.0007 (-20.0)	-.0007 (-19.9)
Other income (000s)[3]	.002 (17.3)	.001 (9.3)	.0006 (8.1)	.0006 (7.5)
Married?	.145 (52.4)	.149 (37.9)	.097 (40.2)	.097 (40.2)
Time Trend	-.001 (-11.3)	-.001 (-5.0)	-.001 (-12.4)	.0001 (0.4)
Delayed Retire. Benefit?				-.018 (-3.8)
Freedom to Work Act?				-.037 (-7.3)
Pseudo R-square	0.0709	0.0497	0.0529	0.0535
Number of Observations	227,907	85,173	130,084	130,084
RCS elasticity	**.063**	**.058**	**.060**	**.031**

* Reporting labor force status in years 1968-2009.
t-statistics in parentheses.
All regressions included 20 dummies for state groupings, age dummies, 4 education dummies, 3 race dummies, an MSA-specific unemployment rate, and 3 indicators of MSA residency status.
[1]Logwage is imputed for those reporting no wage, and instrumented for all.
[2]Defined as total family earnings minus own earnings
[3]Comprising interest, dividends and rent.

Table 3: IV Binary Probit Results for "Proportion Retired"(as self-reported)

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Lagged Total Fertility Rate (000s)	**.025** **(22.2)**	**.083** **(24.4)**	**.117** **(30.9)**	**.100** **(14.7)**
Logwage[1]	-.018 (-17.2)	-.004 (-1.2)	.017 (5.3)	.018 (5.4)
Others' earnings (000s)[2]	-.0004 (-19.5)	-.001 (-18.5)	-.002 (-20.9)	-.002 (-21.0)
Other income (000s)[3]	.0005 (22.1)	.0009 (11.0)	.0008 (8.5)	.0008 (8.5)
Married?	.018 (15.8)	.031 (9.3)	-.021 (-6.3)	-.021 (-6.3)
Time Trend	.003 (31.9)	.008 (30.1)	.012 (43.6)	.013 (24.2)
Delayed Retire. Benefit?				.022 (3.0)
Freedom to Work Act?				-.030 (-2.9)
Pseudo R-square	0.1248	0.1222	0.1345	0.1347
TFR elasticity	**.975**	**1.030**	**.819**	**.700**

	Women aged 55-61	Women aged 62-64	Women aged 65-69	
Relative cohort size (state-year-specific)	**.079** **(15.8)**	**.252** **(14.8)**	**.341** **(17.1)**	**.104** **(4.7)**
Logwage[1]	-.019 (-18.0)	-.001 (-0.4)	.012 (3.5)	.018 (5.5)
Others' earnings (000s)[2]	-.0004 (-19.7)	-.001 (-19.0)	-.002 (-21.3)	-.002 (-21.1)
Other income (000s)[3]	.0005 (23.2)	.001 (12.0)	.001 (10.5)	.001 (9.1)
Married?	.018 (16.1)	.033 (9.6)	-.019 (-5.9)	-.020 (-6.2)
Time Trend	.003 (35.1)	.009 (36.5)	.014 (53.1)	.018 (50.8)
Delayed Retire. Benefit?				-.013 (-1.9)
Freedom to Work Act?				-.136 (-21.7)
Pseudo R-square	0.1214	0.1174	0.1294	0.1332
Number of Observations	227,907	85,173	130,084	130,084
RCS elasticity	**.401**	**.407**	**.310**	**.095**

*Retirement given as the reason for not working in years 1967-2008.
t-statistics in parentheses.
All regressions included 20 dummies for state groupings, age dummies, 4 education dummies, 3 race dummies, an MSA-specific unemployment rate, and 3 indicators of MSA residency status.
[1]Logwage is imputed for those reporting no wage, and instrumented for all.
[2]Defined as total family earnings minus own earnings
[3]Comprising interest, dividends and rent.

Table 4: IV Binary Probit Results for "Receiving Social Security"

	Women aged 62-64	Women aged 65-69	
Lagged Total Fertility Rate (000s)	**.081**	**.080**	**.082**
	(24.1)	**(39.7)**	**(22.7)**
Logwage[1]	-.072	-.027	-.027
	(-16.0)	(-11.8)	(-11.8)
Others' earnings (000s)[2]	-.002	-.001	-.001
	(-26.0)	(-27.5)	(-27.5)
Other income (000s)[3]	.0009	.0009	.0009
	(7.2)	(8.9)	(8.8)
Married?	-.042	-.035	-.035
	(-9.8)	(-15.2)	(-15.3)
Time Trend	.005	.005	.006
	(23.2)	(49.7)	(18.5)
Delayed Retire. Benefit?			-.015
			(-2.4)
Freedom to Work Act?			.013
			(1.9)
Pseudo R-square	0.0852	0.0878	0.0880
TFR elasticity	**.425**	**.265**	**.271**

	Women aged 62-64	Women aged 65-69	
Relative cohort size (state-year-specific)	**.340**	**.392**	**.221**
	(15.8)	**(27.7)**	**(13.4)**
Logwage[1]	-.070	-.034	-.029
	(-15.6)	(-14.3)	(-12.3)
Others' earnings (000s)[2]	-.002	-.001	-.001
	(-26.5)	(-28.3)	(-28.1)
Other income (000s)[3]	.001	.001	.001
	(8.5)	(10.3)	(9.3)
Married?	-.041	-.035	-.035
	(-9.6)	(-15.1)	(-15.1)
Time Trend	.004	.005	.009
	(19.0)	(41.5)	(36.6)
Delayed Retire. Benefit?			-.082
			(-16.5)
Freedom to Work Act?			-.084
			(-15.0)
Pseudo R-square	0.0818	0.0801	0.0844
Number of Observations	85,173	130,084	130.084
RCS elasticity	**.232**	**.169**	**.095**

t-statistics in parentheses.
All regressions included 20 dummies for state groupings, age dummies, 4 education dummies, 3 race dummies, an MSA-specific unemployment rate, and 3 indicators of MSA residency status.
[1]Logwage is imputed for those reporting no wage, and instrumented for all.
[2]Defined as total family earnings minus own earnings
[3]Comprising interest, dividends and rent.

Table 5: Potential Explanatory Power of Relative Cohort Size Variables

	Women aged 55-61	Women aged 62-64	Women aged 65-69
	Average Annual Hours Worked		
Maximum % change from mean	26.1	30.1	51.8
Max. % explained by change in RCS	3.3 (12.7%)	6.6 (22.0%)	7.5(14.5%)
Max. % explained by change in TFR	6.6(25.3%)	11.7(38.7%)	17.8(34.3%)
	Proportion Out of the Labor Force		
Maximum % change from mean	25.4	14.4	10.0
Max. % explained by change in RCS	2.2(8.9%)	2.0(14.1%)	1.1(11.0%)
Max. % explained by change in TFR	4.8(18.8%)	4.6(32.0%)	3.1(31.0%)
	Proportion Reporting Themselves as Retired		
Maximum % change from mean	87.1	80.9	70.8
Max. % explained by change in RCS	14.0(16.1%)	14.2(17.6%)	3.3(4.7%)
Max. % explained by change in TFR	33.5(38.5%)	35.4(44.0%)	24.1(34.0%)
	Proportion Claiming Social Security Benefits		
Maximum % change from mean		17.9	21.8
Max. % explained by change in RCS		8.1(45.4%)	3.3(15.3%)
Max. % explained by change in TFR		14.6(81.7%)	9.3(42.8%)

Table A1: Summary Statistics for Women Aged 55-61

	1969-71	1974-76	1979-81	1984-86	1989-91	1994-96	1999-01	2007-09	1968-2009
Average annual hours worked[6]	893.2	855.6	846.7	854.6	935.1	1037.4	1114.0	1232.8	977.3
Proportion out of labor force[7]	.527	.534	.531	.519	.484	.442	.414	.353	.473
Proportion retired[8]	.009	.016	.028	.059	.077	.116	.134	.111	.070
Relative cohort size[9]	.315	.358	.423	.419	.436	.407	.336	.236	.355
Lagged Total Fertility Rate (000s)	2.236	2.588	3.085	3.519	3.600	2.906	2.366	1.791	2.731
Unemployment rate	.029	.050	.036	.046	.033	.037	.029	.040	.036
Logwage	2.332	2.404	2.502	2.524	2.524	2.579	2.639	2.826	2.560
Other's earnings[10]	34,286	34,887	36,853	35,361	34,516	33,394	39,818	41,346	36,927
Other income[11]	na	na	4,862	6,864	6,630	5,529	6,242	5,288	4,658
Proportion married[12]	.695	.700	.703	.700	.679	.674	.648	.644	.680
<12 years of school	.519	.440	.346	.314	.272	.195	.151	.093	.284
12 years of school	.326	.393	.445	.457	.444	.426	.394	.331	.398
13-15 yrs of school	.084	.095	.124	.124	.147	.219	.246	.282	.171
16 years of school	.048	.047	.052	.064	.079	.101	.124	.178	.090
>16 years of school	.023	.025	.033	.041	.058	.059	.085	.116	.057
Black	.029	.086	.091	.099	.107	.108	.104	.088	.092
Hispanic	.007	.030	.033	.053	.062	.074	.082	.075	.054
Other	.002	.009	.015	.025	.028	.035	.040	.042	.028

[6] Includes those with zero hours. Hours imputed for years before 1976, using algorithm from Finis Welch (1979).
[7] Defined as zero weeks worked in previous year.
[8] As self-reported: reason given for not working.
[9] Number of women aged 25-34 working part time and/or part year, divided by number of women aged 55-69.
[10] Total family earnings minus own earnings.
[11] Interest, dividends and rent. Not available in first two periods.
[12] Proportion married with spouse present

Table A2: Summary Statistics for Women Aged 62-64

	1969-71	1974-76	1979-81	1984-86	1989-91	1994-96	1999-01	2007-09	1968-2009
Average annual hours worked[13]	635.3	576.3	536.6	521.6	534.6	567.9	641.8	780.9	600.1
Proportion out of labor force[14]	.665	.701	.705	.711	.704	.674	.644	.575	.672
Proportion retired[15]	.042	.063	.117	.201	.246	.352	.373	.323	.220
Prop. claiming Social Security benefits	.428	.486	.567	.583	.582	.563	.533	.441	.521
Relative cohort size[16]	.315	.358	.423	.419	.436	.407	.336	.236	.355
Lagged TFR (000s)	2.236	2.588	3.085	3.519	3.600	2.906	2.366	1.791	2.731
Unemployment rate	.024	.039	.034	.040	.030	.044	.023	.033.351	.034
Logwage	2.339	2.394	2.452	2.560	2.493	2.534	2.754	2.734	2.542
Others' earnings[17]	23,966	22,085	21,679	20,800	22,385	21,040	25,453	30,658	23,654
Other income[18]	na	na	5,961	8,106	8,215	5,823	7,555	6,294	5,429
Proportion married[19]	.605	.633	.637	.635	.643	.644	.630	.616	.629
<12 years of school	.575	.501	.423	.350	.309	.248	.195	.115	.333
12 years of school	.255	.333	.395	.442	.446	.423	.421	.351	.387
13-15 yrs of school	.090	.090	.100	.114	.137	.195	.210	.266	.153
16 years of school	.053	.047	.049	.055	.060	.084	.108	.159	.078
>16 years of school	.027	.029	.033	.039	.048	.050	.066	.109	.049
Black	.026	.088	.088	.092	.098	.102	.109	.102	.089
Hispanic	.007	.026	.030	.041	.056	.072	.077	.080	.049
Other	.002	.007	.011	.017	.026	.029	.036	.054	.024

[13] Includes those with zero hours. Hours imputed for years before 1976, using algorithm from Finis Welch (1979).
[14] Defined as zero weeks worked in previous year.
[15] As self-reported: reason given for not working.
[16] Number of women aged 25-34 working part time and/or part year, divided by number of women aged 55-69
[17] Total family earnings minus own earnings.
[18] Interest, dividends and rent. Not available in first two periods.
[19] Proportion married with spouse present

Table A3: Summary Statistics for Women Aged 65-69

	1969-71	1974-76	1979-81	1984-86	1989-91	1994-96	1999-01	2007-09	1968-2009
Average annual hours worked[20]	314.7	233.4	230.5	206.9	260.0	249.6	284.5	423.7	279.2
Proportion out of labor force[21]	.822	.852	.845	.862	.829	.827	.805	.741	.823
Proportion retired[22]	.114	.155	.235	.366	.431	.581	.612	.568	.390
Prop. receiving Social Security benefits	.645	.777	.867	.896	.871	.874	.852	.791	.825
Relative cohort size[23]	.315	.358	.423	.419	.436	.407	.336	.236	.355
Lagged TFR (000s)	2.236	2.588	3.085	3.519	3.600	2.906	2.366	1.791	2.731
Unemployment rate	.034	.055	.053	.046	.035	.034	.040	.029	.037
Logwage	2.370	2.299	2.483	2.401	2.387	2.550	2.788	2.860	2.509
Other's earnings[24]	13,393	11,656	10,594	10,726	12,606	12,194	15,298	17,511	12,807
Other income[25]	na	na	6,254	9,138	9,241	6,909	8,521	6,469	5,904
Proportion married[26]	.497	.516	.526	.541	.570	.559	.572	.557	.545
<12 years of school	.646	.566	.508	.425	.338	.280	.235	.159	.388
12 years of school	.215	.269	.324	.388	.435	.423	.431	.401	.366
13-15 yrs of school	.076	.089	.087	.104	.126	.183	.189	.238	.139
16 years of school	.043	.049	.050	.054	.058	.077	.092	.122	.068
>16 years of school	.020	.027	.031	.029	.043	.037	.053	.080	.039
Black	.024	.092	.096	.090	.095	.096	.098	.098	.087
Hispanic	.007	/.023	.025	.033	.043	.057	.073	.086	.044
Other	.002	.008	.010	.016	.024	.024	.040	.056	.023

[20] Includes those with zero hours. Hours imputed for years before 1976, using algorithm from Finis Welch (1979).
[21] Defined as zero weeks worked in previous year.
[22] As self-reported: reason given for not working.
[23] Number of women aged 25-34 working part time and/or part year, divided by number of women aged 55-69 .
[24] Total family earnings minus own earnings
[25] Interest, dividends and rent. Not available in first two periods
[26] Proportion married with spouse present