Has the Increased Attachment of Women to the Labor Market Changed a Family's Ability to Smooth Income Shocks?

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Does an increase in a married woman's attachment to the labor market affect her family's ability to smooth unexpected income shocks? The unsurprising answer to this complex question is yes, but the extent to which a wife's labor income served as insurance against shocks to the primary earner's income has changed significantly. Between 1970 and 1990, the sharp increase in labor market attachment provided an increasingly important channel through which families were able to smooth income shocks. As the female labor force participation rate stabilized, this contribution to smoothing flattened out. In the Great Recession, however, both spouses were hit by significant negative income shocks greatly weakening (if not eliminating) this insurance mechanism. Throughout the period, families' reliance on (public and private) transfers and other taxable income (such as asset income) to smooth their consumption also changed in important ways.

The literature documenting the volatility of male earnings and family income is substantial (see DeBacker et al. 2013 for a review). Most studies found that both earnings and family income volatility increased from the 1970's to the 1990's, and then evened out for male earnings but continued to rise for family income (although at a much slower pace) since 1995. Despite its obvious importance as a component of family income, the volatility of female labor earnings is a much less studied phenomenon.[1]

Using PSID data for 1968-2011, I find that earnings volatility increased for married men and decreased for married women. The volatility of family income increased over the period, but, interestingly, was flat during the Great Recession. The correlation of spousal income shocks was practically zero throughout the 1970 to 2004 period but increased substantially between 2004 and 2010. Access to transfer income was the main reason family income volatility remained stable over the last recession.

[1] Two recent exceptions are Dynan et al. (2012) and Blundell et al. (forthcoming).

I find that the volatility of total consumption follows similar trends as the volatility of family income (although much smoother), but with a significantly smaller magnitude. This indicates that households were able to smooth some shocks to income, but that the transmission of shocks was not zero.

I. Methodology and Data

I use a nationally representative random (SRC) sub-sample of the PSID data from 1968 to 2011, keeping continuously married[2] households whose heads are not students, retired, or self-employed; and who are at least 25 but less than 65 years old; and excluding Latino, immigrant and the low income SEO subsamples.[3] The resulting sample is about 1,100 continuously married households per year. Because the PSID became biennial in 1997, I compute all growth rates at the biennial level.

Unlike other studies of income volatility, I do not eliminate income observations for those with incomes below some preset minimum or those with very large swings in income due to job loss or reentrance into the

labor market, events that will have large and significant implications to family's welfare. Moreover, since the focus of this project is to study evolution of volatility of earnings for men and women, such exits and entrances are essential. Thus, to compute the volatility of income (for total family income and all its components), I follow Dynan et al. (2012), and compute arc percent change of income.[4] This procedure has several advantages: it is symmetric regarding income increases and decreases, it is bounded between -2 and 2, and, most importantly, it keeps growth rate outliers due to labor market exit and entrance. Because growth rates between two years of zero income are not defined, this formula ignores individuals who do not participate in the labor market in both t and $t-2$ periods. One important implication is that the volatility measure will be biased upward in the early half of the sample relative to the later-half due to the trends in women's labor force participation. Thus, I substitute biennial growth rates with zeros if the individual was not working in both periods.

To compute volatility of income, for each year of the biennial sample, I first run regressions of arc percent change in income as

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[2] Couples must be continuously married during the entire sample period.

[3] Family weights correct for issues related to the unequal probability of selection and attrition. To minimize the impact of outliers, I winsorize income variables at the top and bottom 1 percent. Labor and family incomes are set to missing for those who report positive work hours but zero labor income, or implausibly small hourly wages (below half of the federal minimum).

[4] Arc percent change of income is computed as follows: $\frac{Y_t - Y_{t-2}}{\bar{Y}}$, where $\bar{Y} = \frac{Y_t + Y_{t-2}}{2}$.

a function of demographics[5] and state dummies. Income volatility is then an absolute value of the residuals, with a dummy indicating the direction of the change. Standard deviations (absolute value of the shock) are more natural than variances (squared residuals) since the former is comparable to growth rate changes. Thus, my measure of volatility of income can be thought of as family (or individual) specific time varying changes in income that cannot be predicted by age, cohort, race, gender, education, size and change of the household composition, and location. I compute the volatility of total family income, wife's and husband's earnings separately, other taxable income, and the sum of the public and private transfers received.

I follow the methodology in Attanasio and Pistaferri (2014) to predict total consumption. I impute the logarithm of total non-durable consumption as a function of the third degree polynomial of food consumption (which is the sum of food stamps, food at and away from home), demographics, and socioeconomic variables,[6] consumer price indices, and state fixed effects.[7]

To compute total consumption volatility, I compute arc percent change in total predicted consumption. I remove predictable variation by regressing consumption growth on demographics and state dummies (as for income regressions). The volatility of consumption is the absolute value of the residuals.

II. Results

A. *Volatility of Income*

[FIGURE 1 AROUND HERE]

Figure 1 illustrates the evolution of income volatility for continuously married couples. Between 1970 and 1990, the volatility of wives' taxable earnings decreased, then remained flat until 2004, when it dropped significantly, and then increased sharply post 2006. Overall, between 1970 and 2010, the volatility of wives' earnings fell by 14 percentage points or 23 percent. Around 78 percent of the evolution of the volatility of

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[5] I include year of birth, age, gender, race, education, the number of kids and adults in the household dummies, and change in the number of kids and adult dummies, and a dummy for limiting work disability.

[6] These include head's work hours, and dummies for self-employment, home ownership, and disabilities that limit work.

[7] Formally, this prediction is necessary since the only consistent consumption data in the PSID starting in 1968 is expenditures on food, rent and mortgage payments. Starting in 1999, the PSID included other consumption categories covering about 70 percent of non-durable consumption spending: health and education expenditures, utilities, gasoline, car maintenance, transportation, and child care. In 2005, additional categories were added, but I do not use these for my calculations in order to increase the length of the imputation sample.

wives' earnings can be attributed to the volatility of their hours, as can be seen from the figure.[8] This is a striking result. Husbands' earnings do not demonstrate a similar pattern.

Volatility of husbands' earnings increased between 1970 and 1990 (the two spousal income volatility series almost converged), becoming much more cyclical starting in the 1990s, falling during booms and rising during recessions. Overall, the volatility of husbands' income rose 14 percentage points or 54 percent from 1970 to 2010. Only 45 percent of the variation in the volatility of husbands' earnings can be explained by the volatility of his hours, a much weaker relationship than for the wives. This relationship was weakest from the mid-1990s to the Great Recession, when it strengthened significantly.

Volatility of total family income, which is the sum of taxable earnings and transfer income of husband, wife, and others in the family unit, was relatively flat over the entire time period. It rose only 3 percentage points or 1.5 percent between 1970 and 2010. Continuously married households experience significantly smaller levels and trends of family income volatility than other types of households, which had been the focus of the literature thus far.[9] This finding points to the important role intra-household smoothing plays in reducing the welfare costs of individual earnings volatility.

One way to explore how intra-household smoothing evolved is to examine the change in the shares of each income category. In the 1970s, wives' earned income was only about 13 percent of total family income, rising steadily during the next 40 years, and reaching 27 percent by 2010. The contribution of husbands' income, on the other hand, fell from 73 to 57 percent by 1990, and remained stable over the next 14 years, falling further to 54 percent over the last recession. Thus, in the 1970s combined spousal income contributed 86 percent of total family income but its contribution fell to 81 percent by 2010. The remainder was due to other taxable income and transfers. Transfer income contributions increased from 5 percent in 1970 to 10 percent in 1990, returned to its 1970 level by 2000 and began climbing during the last recession.[10]

[FIGURE 2 AROUND HERE]

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[8] The volatility of hours is computed in a similar way as volatility of income after regressing arc percent change in hours on demographics and state dummies.

[9] See Gorbachev (2011), DeBacker et al. (2013), and Dogra and Gorbachev (forthcoming) who examine family income volatility for all marital statuses and find that it increased by at least 10 percent between 1980 and 2009. Removing only the marital status restriction, I find levels of volatility of income for other types of household (singles, divorced, separated, widowed and/or remarried) in line with previous findings.

[10] The changes in the contribution of other taxable income are the residual of the already discussed changes.

In Figure 2, I examine correlations of shocks.[11] I find that the correlation of spousal labor income shocks was negative but very small, hovering around zero for the entire pre-2002 period. Thus, I find some evidence of an added worker effect during the 1970 to 2002 period. Interestingly, this correlation became positive and rose significantly during the last recession, reaching 8 percent by 2010. Since volatility of both spouse's earned incomes increased substantially during the last recession, but the volatility of total family income remained flat, families used other sources of income, and in particular, transfer income, to smooth shocks to labor earnings. In fact, shocks to husbands' income were always negatively correlated with transfer income shocks. This correlation was negative and large (around -30 percent) until about 1994; it became much less negative over the next 10 years (reaching -10 percent in 2000), but fell again to -18 percent by 2010. The correlation of shocks between wives' labor earnings and transfer income was negative but very small until 1998, when it began to fall, reaching -8 percent by 2010.

[FIGURE 3 AROUND HERE]

One way to isolate the importance of joint labor supply decisions is to shut down the wife's response to family income shocks, keeping all else unchanged. To that end, I build a hypothetical family via random matching. For each year, I conditionally match each man with 100 randomly chosen women.[12] I then compute hypothetical family income for each match, keeping everything except the wife's income unchanged.[13] The results are illustrated in Figure 3. I find that wives' responses played a significant insurance role between 1970 and 1990, but that role was dampened in the second half of the period. The results in the 1970-1990 period demonstrate the importance of smoothing via the wife's earnings: if wives' incomes were unresponsive to spousal and other income shocks, family income volatility would have been significantly larger and would have grown much faster. On the other hand, between 1992 and 2006, the two series have very similar trends, indicating that joint labor decisions had at best a limited role to play in smoothing income shocks. Alternatively, there was a limited need for that role as the volatility of earnings was flat during that period for both men and women.

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[11] These correlations are computed as cross-sectional weighted averages of family specific 6-year moving correlations of shocks.

[12] The match is conditional on the age of the actual spouse, plus or minus 3 years to maintain a sample size large enough for matching.

[13] Because the sample is highly unbalanced, this exercise does not allow me to also eliminate the channel of volatility coming from changes to marital status (since the husband is assigned a new wife every year). Preliminary examination indicates that assigning a new wife every year, increases the level of family income volatility but does not change the trends in significant ways.

In the Great Recession, however, hypothetical family income volatility increased, but the volatility of actual family income was flat. This result indicates that (at least) during the Great Recession, families were no longer able to rely on wives' income for smoothing shocks and thus other insurance mechanisms became more important. This counterfactual exercise does not allow me to separate whether the sources of smoothing have changed due to the change in the responsiveness of wives' earnings to family income shocks, or due to the depth of the Great Recession; this is left to future research.

B. *Volatility of Consumption*

[FIGURE 4 AROUND HERE]

I find that, in line with previous research, the volatility of total consumption exhibited similar trends to the volatility of family income throughout the period but had a significantly lower magnitude (Figure 4).[14] This finding is not due to the strategy used to impute total consumption: volatility of total consumption, computed on the actual (rather than imputed) data, shows trends very similar to the trends in family income. Moreover, the imputation does a very good job in

reproducing these trends. This indicates that families were able to smooth shocks to family income, but that the transmission of shocks was far from zero. Moreover, this ability to smooth did not change much during the entire 40 year period. Previous research by Dogra and Gorbachev (forthcoming) indicates that liquidity constraints played a crucial role in propagating volatility.

III. Conclusions

The increase in women's labor force participation played an important role in allowing families to smooth income shocks, but its relative importance has changed over time. In the 1970 to 1990 period, wives' income substantially counteracted the increasing volatility of husbands' earnings. In the 1990 to 2004 period, this role was greatly reduced. Finally, during the Great Recession transfer income played an important role in allowing families to smooth increasingly correlated negative shocks to spousal earnings. I find that consumption volatility grew at a similar rate as the volatility of family income, although the level of consumption volatility was significantly lower. Families' ability to smooth income shocks did not change much during the 1970 to 2010 period even though the source of the insurance changed.

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[14] See Gorbachev (2011) and Dogra and Gorbachev (forthcoming) who find similar results using volatility of food consumption to infer the volatility of total consumption.

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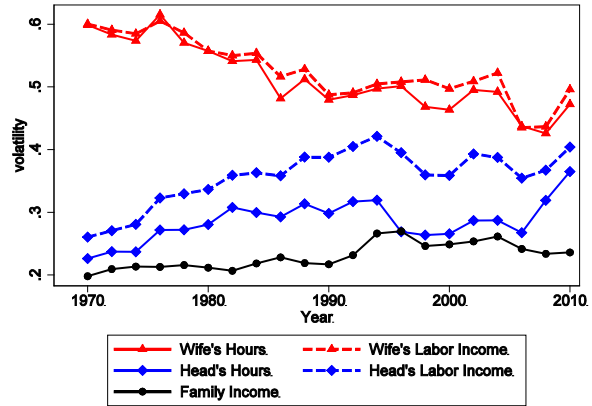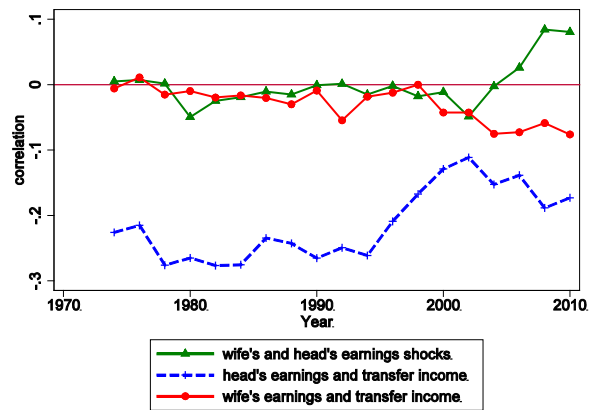
FIGURE 1. VOLATILITY OF INCOME AND HOURS

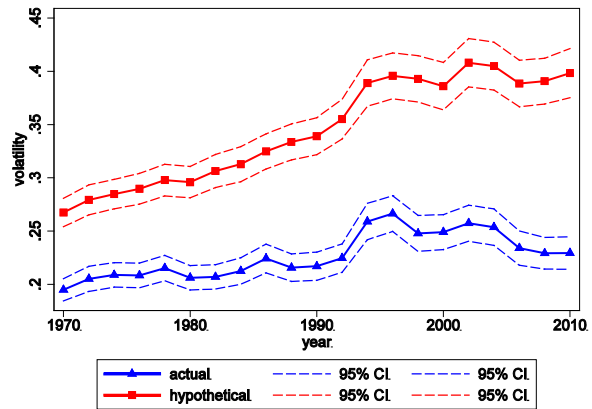FIGURE 2. CORRELATION OF SHOCKS TO FAMILY INCOME
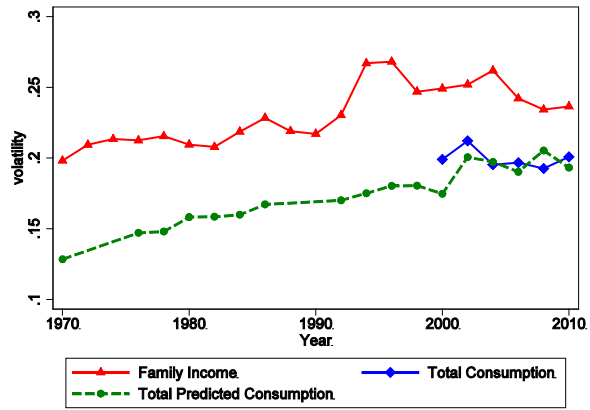

FIGURE 3. VOLATILITY OF FAMILY INCOME: ACTUAL VS. HYPOTHETICAL

FIGURE 4. VOLATILITY OF CONSUMPTION VS. FAMILY INCOME