A Do-Over for the Tax Unit

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Margherita Borella, Mariacristina De Nardi, and Fang Yang, *Are Marriage-Related Taxes and Social Security Benefits Holding Back Female Labor Supply?*, NBER Working Paper No. 26097 (July 23, 2019), available at SSRN.

There has been a surge in empirical literature examining gendered patterns of behavior and outcomes across numerous economic contexts, especially choices within and across families. Relatively little of it has focused explicitly on how the basic structure of our tax laws interacts with and influences such choices. Encouragingly, a recent working paper by Margherita Borella, Mariacristina De Nardi, and Fang Yang does exactly that.

Borella, De Nardi, and Yang (BD&Y) study two key policies within the U.S. tax-transfer system: joint income tax filing for married couples and access to Social Security benefits for spouses. The joint income tax filing rule means that a married secondary earner will owe income tax at the marginal rate established by "stacking" her income on her spouse's income, which generally is a higher rate than would apply if the secondary earner was single. Social Security benefits also increase to account for an earner's spouse, but do not increase to account for an earner's unmarried partner.

Both of these policies are gender-neutral on face; however, the background conditions under which they operate are not. Lower average female wages, hours, participation rates, and overall weaker attachments to the formal labor force as compared to males imply that, for the average heterosexual married couple, secondary earners are female. Conceptually, joint tax filing's income-stacking effect penalizes married women in the same way that its income-splitting effect benefits married men. These same factors plus longer female lifespans set up Social Security's spousal benefit rules as additional potential deterrents to formal market work for women. In light of these patterns, BD&Y pose their research question: "to what extent does the fact that taxes and old age Social Security survivor benefits depend on one's marital status discourage female labor supply and affect welfare?" (P. 2.)

This is a terrific question that has been difficult to answer without a natural experiment or an elaborate decades-long field trial. BD&Y address it with an original modeling and computationally intensive empirical approach that proceeds from rich survey data (see the discussion below the line for a brief summary). Their model considers a series of factors that have not been part of prior models, such as the possibility of non-discrete changes to male labor force participation as a result of women's participation choices, the non-childcare costs of working for non-parents as well as parents, and the relationship between market wages and shadow non-market wages. Like all structural models of economic behavior, BD&Y's model begins from some strong assumptions. But the additional factors BD&Y take into account arguably aren't just bells and whistles: marriage-based rules are likely to affect, and interact with, many dimensions of behavior. Thus, BD&Y's model helps broaden researchers' scrutiny to new mechanisms that may be at play.

BD&Y rely on two sources of data to answer their question: the Panel Study of Income Dynamics (PSID) and the Health and Retirement Survey (HRS). Within this data, the authors focus on two distinct cohorts of individuals. They study the cohort born 1941-1945 because "their entire adult life is covered by the PSID…and then by the HRS…we have excellent data over their entire life cycle." (Pp. 3, 9.) They also study the cohort that was born ten years later (1951-55) because its data also spans a good part of their lifecycle and, importantly, the labor force participation patterns of the 1955 cohort are higher than the 1945 cohort and broadly similar to that of later cohorts. (Pp. 4, 57.) BD&Y use data on about 5000 individuals that were born in the relevant years. (P. 57.) They then use computational methods to "simulate a representative population of people as they age and die" (P. 24) and choose the parameters of their model so that nearly 450 different "fit" criteria (such as averages and other statistical measures) that the data generates looks like

those in the observed data. These parameters are crucial determinants of individuals' decisions about whether and how much to work, consume, and save over the full course of their working lives and into retirement. Then, they are able to change one of the "structural" features of their model—how married individuals file taxes—and observe how people would behave under this different scenario.

The result is pretty staggering. When BD&Y estimate their model for the 1945 cohort under the assumption that married persons file taxes as single individuals rather than jointly, they predict that the single-filing system would increase married women's labor participation by more than 20 percentage points from age 25 through age 35 as compared to the status quo.(P. 39.) From ages 35 to 60, married women's participation would be 10 percentage points higher. Single women's participation also would increase slightly until age 60. The mechanism here appears to be that many women expect to get married and, once joint tax filing is removed, they adjust their participation accordingly. (P. 39.) According to Figure 10 in the paper, the participation of single men holds steady; after age 60, married men's participation falls slightly. (P. 38.)

What is the effect of removing joint tax filing on workers' incomes from labor? The authors discuss only their estimates of the effects of eliminating both joint tax filing and Social Security's marriage-based rules. When both policies are changed, there are strong responses. BD&Y find that increased female labor market experience pushes up married women's wages by about 5% and that this, together with the drastic rise in participation and a moderate increase in hours worked for each woman working, drive significant female labor income effects for both the 1945 and 1955 cohorts. (P. 41.) For the 1955 cohort, Figure 13 charts labor income increases for married women as being about $5,000 to $6,000 higher annually (in 2016 dollars) for nearly all pre-retirement years. Average annual labor income for single women also increases significantly. Male labor income remains stable until about age 50, at which point it falls moderately (about $1,000 per year) until age 65. (P. 41.)

These results underscore the centrality of policies that narrow the gap between females' and males' labor supply choices, particularly earlier in their careers. For men and women alike, BD&Y's results echo other studies in finding that accumulated human capital from work experience has a greater influence on wages than other factors like education. (Pp. 25-26.) Robust female participation, particularly during lifecycle years when their children are likely to be small, lays the groundwork for greater wage and income equality later in the lifecycle. BD&Y's paper provides evidence that joint filing discourages this outcome.

In going to great lengths to estimate rigorously the impact of a core structural element of the U.S. income tax (joint filing), BD&Y have done valuable work. Their findings are not presented as a rallying cry for revisiting longstanding normative questions about gender (in)equality's role in the design of tax policy. But the larger context invites such a read. At bottom, this paper provides new empirical support for the premise that gender belongs at the center of tax policy debates about inequality.

Situating BD&Y's Model and Empirical Approach

The authors address their research question in four steps.

First, they model the structure of individuals' preferences about whether and how much to work, consume, and save each year across their adult lives. The model features three distinct lifecycle periods: working years, early retirement years, and retirement years. It posits a set of constraints that varies across each stage; each of these constraints takes into account gender, year, and marital status. The model includes wages (more on this), shocks to wages, fixed non-childcare costs of working such as commuting, costs of raising children, purchasing childcare, accumulated earnings, assets, Social Security benefits, Medicaid, SSI, medical expenses, and death, among other variables. The tax environment experienced by each individual varies by cohort, year, and marital status as reflected in the PSID data and the National Bureau of Economic Research's TAXSIM simulation program, which allows for negative tax rates including

the EITC. (Pp. 16, 73-75.)

Second, BD&Y use data for the cohorts born in 1945 and 1955 to simulate larger representative datasets for each cohort. Specifically, they "use the model to simulate a representative population of people as they age and die, and we find the parameter values that allow simulated life-cycle decision profiles to best match…the data profiles for that cohort." The mechanics of this involve matching 448 different "moments" (population averages) for each of the two cohorts. (P. 24.)

Third, they generate estimates of their structural model to learn how labor supply responds to taxes and Social Security for each cohort. The authors explain that "to have reliable solutions, we compute them brute force [using numerical methods] on a [discretized asset] grid." (Pp. 24, 76.) Buried in one of the many appendices is the statement that "[e]stimating the model for one cohort implies solving it thousands of times, which thus requires at least 3 or 4 weeks each time…to check for local minima, robustness, and so on." (P. 77.) Kudos to them for not giving up.

Last, BD&Y investigate the counterfactual of removing the marriage-based tax filing and Social Security policies. In particular, the revised model subjects married individuals to the tax and Social Security functions that would be applied in a given year to similarly situated unmarried individuals. Methodologically, this is the main payoff to using a model like BD&Y's: "[t]he basic gain from using the structural models is that they allow a better understanding of the mechanisms and analysis of counterfactuals." (Pp. 42, 44.) In addition, it allows BD&Y to say something about how policies affect welfare. Would eliminating the marriage-based policies result in an increase or decrease in overall "value" to different groups of individuals in each cohort? BD&Y use a series of value functions, which are akin to dollar-denominated translation of utilities (P. 17), for nine different groups. The groups correspond to the model's three lifecycle stages for each of three marriage/gender statuses (single male, single female, and married male-female couple from which individuals' value functions are derived). (Pp. 17-23.)

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