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**The Man of the House – How the Use of Household Head Characteristics may lead to
Omitted Variable Bias**

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Abstract

Household heads are defined in many micro data sets and are usually male. This paper illustrates potential consequences of the common practice of using only the household head's characteristics in empirical research.

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1 Introduction

Many household surveys define a household head to ensure that households are not counted twice and to report the relationship with other members.² Because of the way the household head is defined, this person is usually male.³ Economists who use the characteristics of the household head to explain household decisions sometimes make this fact explicit (for example, Charles, Hurst, and Roussanov, 2009) but not always (such as Juster et al., 2005).⁴ In either case, the implications for the interpretation of the results are rarely addressed. Often, head characteristics are used without describing how the household head is assigned (e.g., Field 2007).

Using the characteristics of the household head to characterize a household implicitly assumes either that only the head's characteristics influence the household decision or that decision makers within the household have the same preferences, assumptions not compatible with common household decision models (Browning, Chiappori, and Lechene, 2006). If these assumptions are incorrect model estimates may be biased.

Consider, for example, the commonly used ordinary least squares regression (OLS). Here, the omission of relevant variables in an estimated equation leads to omitted variable bias in coefficients of variables that are correlated with the omitted variable. Since spousal variables are

² Some of the surveys use different terms for the same or a similar concept; I use the term headship to encompass all of these.

³ Indeed, in the literature the term female headship is used to denote households with a single mother (see, for example, Hoynes, 1997).

⁴ Economics is not alone in this. For an example from sociology, see Crowder and South (2005).

correlated, the omission of spousal characteristics results in omitted variable bias if spousal characteristics affect the outcome. In the simple case of a univariate estimation the sign of the bias is the sign of the correlation between the omitted and the included variable, and the bias is greater the more the spousal characteristics affect the outcome. It is not straightforward, however, to sign the bias or to assess its size in multivariate estimations since the bias depends on the correlations of the omitted and included variables. Omitted variables are even more problematic in nonlinear estimations, such as logit or probit, where omitted variables lead to inconsistent coefficients even if they are not correlated with other explanatory variables.

The goal of this paper is twofold: First, to document how household heads are defined in commonly used U. S. microdata sets and to demonstrate that household heads' characteristics are insufficient to fully characterize a household; and second, to illustrate the potential for omitted variable bias. To my knowledge, no study has addressed how the conditioning on household head characteristics might affect estimation results. This paper also relates to the small literature on the usefulness of the headship concept (see, Biddlecom and Kramarow, 1998; Varley, 1996).

There are two additional pitfalls of relying on head characteristics to describe households. First, the practice of selecting a working sample based on household head characteristics in surveys where married women may be designated household heads may lead to sample selection bias. Since in these surveys the share of married women being designated heads has steadily increased over the past years, sample selection changes over time. Households with married female heads are also systematically different from those with male heads – such female heads have more education and greater shares of the total household income (Biddlecom and Kramarow, 1998). In addition, head selection itself may be endogenous to the outcome studied,

for example, family composition (especially single parenthood) might change as a direct result of welfare reform.

Secondly, male household head characteristics are often derived from proxy responses by their female spouses since women tend to be more easily reached and willing to answer surveys (Carr and Hertvik, 1993). Proxy responses are noisier than self-reports and potentially biased (Roshwalb, 1982). Proxy responses can also lead to confusion about whose responses are collected. Consider for example the Survey of Consumer Finance (SCF), where race and attitude variables are collected only for the respondent. In a review of articles using the SCF, Lindamood et al. (2007) report that most authors did not clearly state whose characteristics were used and that sometimes characteristics of the head and the (different) respondent were used and interpreted as if they were of the same person.

2 The Definition of Household Heads in U.S. Surveys

Survey respondents are typically asked to name the family member who is the head of the household, the reference person, or the householder.⁵ In most datasets, a household head is defined as the male of a couple, and a reference person or householder as the person in whose name the residential unit in which the household lives is rented or owned. For six commonly

⁵ See Smith (1992) for a history of the meaning of family and household and Folbre and Abel (1989) for a discussion of the move from the use of household head to householder in the US Census.

used US household surveys, Table 1 shows which of these concepts is used, how it is defined, and the percentage of married men designated as such for the most recently available year.⁶

In the two surveys using the concept of head of household, the share of men in married couples who are designated heads is around 99%. Three of the surveys define a householder or reference person. In the 2010 US Census, the share of male household heads among married couples was 84.5%. The more frequently collected Current Population Survey (CPS) and Consumer Expenditure Survey (CEX) used to have similarly high shares, but these have steadily decreased over the last years. In the CEX in 2011, 53% of married householders were men, down from 85% in 1994. Similarly, in the CPS the share of married male householders fell from 88.6% in 1994 to 59.8% in 2012.

Contrary to market research data collection, there is only one possible reference person per household in these five surveys. For example, A. C. Nielsen allows its consumer panel participants to have more than one head per household.⁷ The only exception among the US household surveys is the Health and Retirement Study (HRS), which has no such designation.

Table 1 about here

⁶ The use of household heads is not restricted to the US . For example, in the Dutch DNB Household Survey the head is chosen by the household, with the indication that the person who owns or rents the home should be chosen. In 2011, the household head is male in 87% of couples. Thanks to Marcel Das for clarifying the definition.

⁷ Evidence based on personal experience as a previous member of the consumer panel.

3 Household heads' characteristics are insufficient to characterize households

Spouses are quite different even in basic characteristics. The greater the differences and the more important spousal characteristics are for household decisions the greater is the potential for omitted variable bias.

For example, in the 2010 wave of the HRS women are on average 3.3 years younger than their male partners, but this masks important differences: in 16% of couples the man is younger than the woman, and in 10% there is no age difference.⁸ 6.2% of spouses are of different race, a share that is smaller for this older age group and one that is likely to increase in the future.⁹ 21% of couples report a different religious affiliation. Less than half of the couples (44%) report the same education; 27% of women have more education than their male partners. This implies that despite many commonalities, spouses differ in characteristics often deemed important for economic decisions.

The household head as it is commonly defined is often not considered to be the main decision maker in a household.¹⁰ In 1992, the HRS asked respondents about who has the final say in major family decisions, such as where to live or how much money to spend on major purchases. Only 19% of couples agree that the man is the main decision maker. Even when ignoring disagreement between spouses, only 30% of men consider themselves as having the

⁸ I use the RAND HRS Data, Version L, and enhanced fat files.

⁹ The median age of men in the data is 71. The number of interracial marriages has increased dramatically over the past 30 years, though it remains a small percentage of all marriages (Rosenfeld, 2006).

¹⁰ See also Lundberg and Ward-Batts (2000) who find that both husbands' and wives' characteristics are determinants of net worth.

final say. Thus, in a majority of couples in the HRS the male spouse is not considered the final decision maker but would be defined as the household head in many surveys.

This is also supported by a survey conducted by the Pew Research Center (Morin and Cohn, 2008), which found that men are less likely than women to have the final say in choosing shared weekend activities and buying major things for the home.

4 An Example of Biased Results: Home Ownership

As an example of potential implications of not using characteristics of the household head's partner, I present the results of a simple OLS regression of homeownership.¹¹ The sample includes men with a mixed-sex spouse or partner from the 2010 HRS with non-missing information on own and spousal variables. The results of three specifications using the characteristics of the male, the female, and of both are shown in Table 2.

The differences in the coefficients across specifications are evident.¹² The biggest differences occur for the educational variables, where the differences between spouses are largest. Compared to using only male characteristics, using those of both spouses shows a stronger relationship between higher educational levels and home ownership, and the (female) spouses' coefficients are greater than the males', most importantly for College education.

¹¹ For ease of exposition, I estimated an OLS model to demonstrate the omitted variable bias since in a probit model the coefficients are also inconsistent.

¹² Comparisons of coefficients need to take into account the potential of high levels of multicollinearity if spouses are similar and sample sizes not sufficiently large. In this case, any interpretation of results needs to take into account the effect of multicollinearity on the variance of the estimates.

Predicted probabilities for homeownership thus differ as well. For example, for the regression including characteristics of both spouses, the probability of homeownership for men with a high school degree (the median level of education for both genders) are 92.7% if the spouse has a College degree and 84.6% if the spouse has not completed high school. This is a relevant comparison since 9% (5%) of the overall sample are couples where the male spouse has a high school degree and the spouse has a College (high school degree) degree.

Table 2 about here

5 Conclusions

Many surveys assign a head of household, sometimes also called householder or reference person. Because of the way this concept is defined, in the majority of cases the head is the man in a couple. Using only characteristics of the household head to explain household decisions may lead to biased results if the spouses' characteristics influence household decisions. Using data from the HRS, I show that spouses differ in demographic characteristics and that in the majority of couples, the man (who would be defined as the household head in most data sets) is not considered by both partners to have the final say in major decisions. A simple example of relating home ownership to characteristics of both spouses via an OLS regression shows the bias resulting from omitting the female spouses' characteristics. This illustrates the potential pitfalls of using only the characteristics of the household head to explain household decisions.

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Table 1: Household Head Selection in Selected US Surveys ¹

Survey	Term used	Choice of head		% of Men of Married Heads
		of mixed-sex couple	if more than one possible choice	
US Census	Householder	In whose name the house is owned, being bought, or rented. If none: any adult above age 14.	Respondents choose	84.5% (2010)
Consumer Expenditure Survey (CEX)	Reference person	The person who owns/rents the home	The person first mentioned by respondent	53% (2011)
Current Population Survey (CPS)	Reference person or Householder	The person who owns/rents the unit	Not further specified than could be either husband or wife	59.8% (December 2012)
Health and Retirement Study (HRS)	No such concept			
Panel Study of Income Dynamics (PSID)	Head	Male, unless incapacitated or unable to fulfill the functions of head (disabled), then female ²	The person with the most financial responsibility for the family	98.9% (2009)
Survey of Consumer Finances (SCF)	Head of household	Male	If same sex couple: the older one	99.1% (2010)

¹ Information taken from official websites. In no case is it possible to select more than one head.

² " There are also a few cases where the female half of a married couple insists on being the Head (...)." PSID website, FAQ #84, assessed November 5, 2012

<http://psidonline.isr.umich.edu/Guide/FAQ.aspx?Type=ALL>.

Table 2: OLS Estimates of Home Ownership

		(1)	(2)	(3)
Men's characteristics	Divorced in past	-0.025** (0.010)		-0.005 (0.012)
	Education: GED	0.045* (0.023)		0.032 (0.023)
	Education: high-school	0.060*** (0.014)		0.039*** (0.015)
	Education: some college	0.059*** (0.015)		0.035** (0.016)
	Education: college +	0.056*** (0.015)		0.024 (0.017)
	Women's Characteristics	Divorced in past		- 0.042*** (0.010)
	Education: GED		0.045* (0.024)	0.037 (0.024)
	Education: high-school		0.075*** (0.015)	0.063*** (0.015)
	Education: some college		0.076*** (0.016)	0.063*** (0.017)
	Education: college +		0.090*** (0.017)	0.081*** (0.018)
R-squared		0.043	0.050	0.053

*HRS 2010, couples only. Standard errors in parentheses, * $p < 0.15$, ** $p < 0.10$, *** $p < 0.05$.*

Variables included but not shown: Log of income, "No Children" and "One Child" as household characteristics, and age, race and ethnicity as individual characteristics, as well as a constant. $N=4,484$. Bold numbers show statistically significantly different coefficients at the 5% level compared to column (3).