A Model of Demand for Health and Caregiving Incorporating Marriage Markets

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It is now more than fifty years since Michael Grossman first published models of demand for health (Grossman 1972a, 1972b), thereby pioneering analyses of various health-related behaviors by households such as parental investments in children's human capital, the schooling-health relationship, unhealthy behaviors, formal and informal home care, and the opportunity cost of time in health-related investments. The model, still in use after more than 50 years, accounts for substitution between producing health at home and purchasing commercial goods and services that contribute to individual health. Like the models of household production of his professors at Columbia in the late 1960s, Gary Becker (1965) and Jacob Mincer (1963), Grossman's model of health consumption is 'unitary': it assumes that multi-agent households, such as

couples, make decisions regarding household production as if they were a single unit, overlooking possible conflicts of interest between members of a couple and the factors that may influence the well-being of one individual member of a couple but not the other.[1]

In the early seventies Becker published his first marriage models (Becker 1973), with individuals deciding choice of match and their individual consumption. However, he continued to assume that households decide about household production. In terms of who makes decisions—individuals or multi-person households—these and subsequent marriage models by Becker (e.g. in Becker 1981) are hybrid models. His student at the University of Chicago during the 1970s, Amyra (Shoshana) Grossbard, went further: she developed marriage models in which individuals—not households—make all decisions, including those regarding production at home (starting with Grossbard 1976). She models production

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[1] Earlier work by home economists such as Margaret Reid (1934) recognized and measured household production but did not integrate it into analytical models of consumption or labor supply assuming utility maximization.

as resulting from matches between workers and employers, with all agents being individual utility maximizers.

The choices available to a health consumer (or investor) differ, depending on whether one adopts the assumptions of Becker-Mincer-Grossman or those of Grossbard, as highlighted in Figure 1. The 'household' according to Becker-Mincer-Grossman has a two-way choice between producing a good in the household and purchasing it. Grossbard's individual has a three-way choice between purchasing a good, producing it at home by oneself, or getting a spouse or partner to produce it at home. This three-way choice applies not only to individuals living in couple but also to singles who plan to employ the household production work of spouses/partners in the future or who plan to work in household production benefiting a spouse.

By dividing the population into workers and employers, Grossbard's WIHO (work-in-household) model facilitates the application of standard labor models to household economics. Productive units coordinate the activities of workers and employers, with prices contributing to such coordination. In the case of labor relations, these prices are wages. In the case of households, prices for work in household production benefiting a spouse are not observable. However, how marriage market conditions may affect health-related consumption (and others individual consumption) can be predicted due to the presumed effect of these conditions on prices and therefore on quantities consumed. Here we present a summary of the WIHO model and some health-related testable implications regarding the role of sex ratios and heterogeneity among marriage market participants. More health-related implications from this approach based on Grossbard-Shechtman (1984) can be found in Grossbard and Hakak (2022).

I. Summary of the modeling approach

WiHo is defined as Work in Household Production for the benefit of a spouse (Grossbard-Shechtman 1984). This includes caring for a spouse, a spouse's children (possibly joint children) or other people a spouse cares about such as an older parent. Variation in the price of WiHo is expected to have the following effects.

A. Demand for WiHo by employers of WiHo is expected to be a negative function of the price of WiHo. The more expensive WiHo the more WiHo employers are likely to rely on substitutes for WiHo, such as commercial or government health services, hired help at home, or own time. Higher WiHo prices may

also affect the tasks employers want WiHo workers to do.

B.   Supply of WiHo by workers is expected to be a positive function of the price of WiHo, i.e. their supply is likely to be upward-sloping. Supply of some tasks may be more sensitive to the price of WiHo than others.

C. Many participate in markets for such work, on the demand side and the supply side. Prices for WiHo are established where demand and supply intersect. The larger the supply of WiHo workers relative to the demand, the lower the equilibrium price of a WiHo worker implying that the worker will have less access to consumption goods. Conversely, lower prices of WiHo are likely to raise the well-being of WiHo employers.

Many observable factors could possibly affect the price of WiHo, and consequently lead to testable implications for health behaviors. One such factor is the sex ratio, i.e. the ratio of men to women, as discussed in the next section. How prices of WiHo may vary across separate markets for WIHO defined by heterogeneous traits of individual WIHO market participants, with implications for observable health behaviors, is the subject of Section III.

II. Testable implications regarding health behaviors and sex ratios

The predicted effect of sex ratios on health outcomes is clearer if one assumes heterosexuality and traditional gender roles: women are WiHo workers and men employ WiHo. Then higher sex ratios imply that there is relatively more demand by men and/or less supply in markets for women's WiHo, which in turn implies a (unobservable) higher price of women's WiHo (see Grossbard-Shechtman 1984). The net expected effect of higher WiHo prices on amount of WiHo depends on size of shifts in demand and supply and may differ depending on whether individuals are already in couple or not, exogenous social norms regarding gender roles, and proportion of heterosexual couples.

The net amount of WiHo work supplied by women may increase to the extent that a shift in demand dominates. At higher prices of WiHo men may learn to rely less on women's WiHo and women may require higher compensation per task of WiHo performed, possibly performing fewer unpleasant tasks such as cleaning floors (norms regarding gender norms may to some degree be endogenously related to conditions in markets for WIHO).

An example of testable prediction is that at higher sex ratios and higher price of WiHo it is more likely that women are the caregivers of needy parents-in-law. However, when and where sex ratios are higher married women may perform fewer difficult tasks, such as taking a handicapped mother-in-law to the toilet.

As for possible effects on demand for commercial alternatives to WiHo, it is predicted that under the same assumption of a traditional society, where sex ratios are higher it is more likely that older parents will be cared for in institutions substituting for at-home care or by paid caregivers not related to the family.

The more traditional the society, the less it is likely that variation in WiHo prices will lead to changes in existing social norms regarding demand and supply of WIHO. Instead, higher WIHO prices may feed the demand for health services supplied by third parties outside the couple. Hence, within highly unequal societies, wealthier families may avoid changing norms as a result of changes in WiHo prices to the extent that upper-class women's WIHO work may cheaply be substituted with paid work by low-income women.[2]

III. Testable implications regarding health behaviors and heterogeneity in marriage

Individuals vary in traits such as race, education, youth, body weight, and religion.[3] Traits of self and (potential) partner are likely to be associated with health behaviors, as was recognized by Grossman (1972b). However, Grossman has not modeled demand for health services or propensity to care for others as a function of the combination of individual traits of two members of a couple. The Grossbard perspective takes into consideration the presumed effect of individual traits on the price that WiHo workers may earn and that WiHo employers may pay in each WiHo market defined by a particular combination of traits of workers and employers. Taking account of this heterogeneity leads to novel predictions regarding demand for health and amount of caregiving. To simplify the exposition, we focus on the case of markets for traditional women willing to do WiHo work for the benefit of traditional men. We consider one trait of each partner at a time, leaving the other traits constant.

Consider Couple A, where the man ranks lower than the woman on a particular trait, and Couple B where both members have the same

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[2] According to Costa et. al. (2016), in Brazil, a country with high income inequality, 92% of paid domestic workers are women.

[3] We focus on observable individual traits; data on individual income and wealth is often hard to get.

rank. It is expected that relative to the woman in Couple B the woman in Couple A will obtain a higher price for her WiHo. In turn, a higher price of WiHo implies that ceteris paribus (including controls for the partners' individual income and education) she is likely to do fewer of the unpleasant tasks involved in WiHo such as care for a needy parent-in-law. She may also have more leisure and the couple may spend more time in joint leisure. Now consider another couple, Couple C where the woman ranks lower than the man on that same trait. It is predicted that the woman in Couple C will obtain a lower price for her WiHo than the woman in the other two couples, and therefore that the woman in Couple C will engage in more unpleasant aspects of caring.

How valuable is an individual trait on marriage markets? Prior research about marriage rates or other outcomes related to marriage market conditions could be useful here. For example, the value of darker skin in marriage markets could be inferred from data on likelihood of being married. Goldsmith et al. (2007) found that in the USA women with darker skin are less likely to be married, which may be another indication of racism in the USA. Assuming traditional gender roles, a prediction that follows from that is that white women in couple with black men will do fewer unpleasant caregiving tasks than women in all-white couples.

Another individual trait that appears to be valuable on marriage markets is relative youth (Grossbard-Shechtman and Neuman 1988). People who are substantially younger than their partner may obtain higher prices for their WiHo than those closer to their partner's age. It follows that in a traditional society much younger women may perform fewer unpleasant caregiving tasks than women close to their partner's age.

Our perspective may also throw light on how demand for health goods and services is likely to vary with individual traits of men and women. For example, it is predicted that, assuming traditional gender roles and controlling for income and all other relevant traits, in couples composed of black men and white women there will be more use of paid caregiving services than in all-white couples.

IV. Conclusions

In this paper we present the determinants of household demand for paid caregiving and other health services by modeling these services as substitutes for own caregiving and caregiving by a spouse or partner. We summarize Grossbard's WiHo model, which recognizes that those who do caregiving within families often expect to be compensated

financially by other household members who benefit from their work, a point ignored by earlier economic models about household production and its alternatives.

The model leads to the testable implication that sex ratios may affect demand for health and propensity to care for relatives. It is also predicted that demand for health and propensity for in-family caregiving may be a function of individual traits of both men and women who form couples. These new insights are valuable in aging societies where increases in life expectancy are likely to lead to rising needs for elder care.

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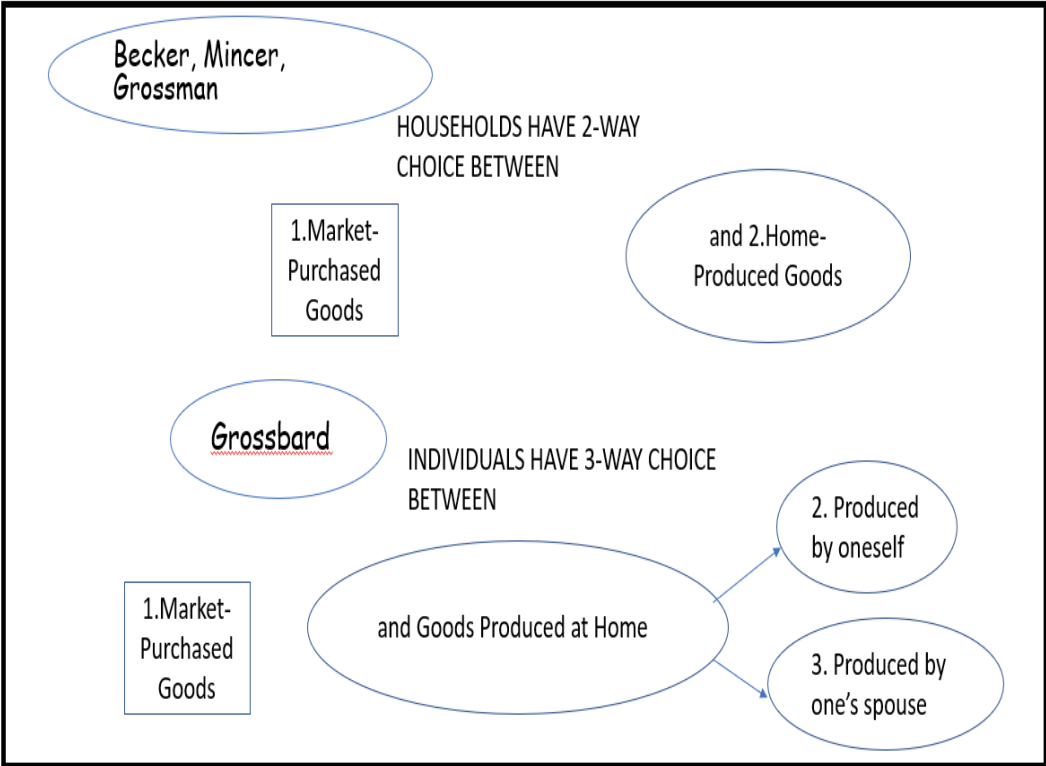Reid, M. 1934. The Economics of Household Production. New York: John Riley.

[Insert Figure 1 Here]

FIGURE 1. ADDING GROSSBARD TO GROSSMAN