How Economic Empowerment Reduces Women's Reproductive Health Vulnerability: Evidence from Northern Tanzania

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ABSTRACT. *This article uses data from Northern Tanzania to analyse how economic empowerment helps women reduce their reproductive health vulnerability. It analyses the effect of women's employment and economic contribution to their household on health care use at three phases in the reproductive cycle: before pregnancy, during pregnancy and at child birth. Economic empowerment shows a positive effect at health seeking behaviour during pregnancy and at child birth, which remains robust after controlling for bargaining power and selection bias. This indicates that any policy that increases women's economic empowerment can have a direct positive impact on women's reproductive health.*

I. Introduction

In most developing countries, women do not have complete control over their physical well-being, including their health, bodily integrity and security. This becomes clear when pregnancy-related decisions are made. When and how many children to have, and whether and where to seek pre-natal and delivery care, are crucial decisions that directly influence the health and survival prospects of women and their (unborn) child. However, as these decisions are made within the context of a household or family, they might be outside the control of women themselves (for example S. Becker, 1996; Urassa, Massawe, Lindmark, & Nyström, 1997).

Millennium Development Goal 5, according to which maternal mortality rates are to be reduced by 75 per cent between 1990 and 2015 and universal access to reproductive health is

achieved, is one of the goals on which least progress has been made, especially in East Africa (Simwaka, Theobald, Amekudzi, & Tolhurst, 2005). At the UN Conference on Population and Development (ICPD) in 1994, the role of women's economic empowerment to promote reproductive health and rights was emphasized, and although the general effect of empowerment on women's reproductive health is unlikely to be questioned, the size of this effect as well as the mechanisms through which it works, are less clear. For policy effectiveness this is of high importance. In this paper we focus on the potential effect of women's economic empowerment on reproductive health service use, as a way to reduce the risk of unintended pregnancy and complications during pregnancy and child birth, hence reducing reproductive health vulnerability.

The potential effects of women's economic empowerment depend on how households are actually organized. Different household models exist, leading to competing hypotheses. Whether household members act as autonomous agents, bargaining processes are taking place among household members who (partially) pool income, or households pool all resources and act upon a common set of preferences, matters for the hypothesised effect of women's economic empowerment on reproductive health service use (for a review of these models, see for example Agarwal, 1997; Haddad, Hoddinott, & Alderman, 1997; Lundberg & Pollak, 1996).

In this study, we test competing hypotheses by analysing the effect of women's employment and contribution to their household's income on their use of reproductive health care services in Tanzania. For this, we re-interviewed a subsample of women from the Tanzanian Demographic and Health Survey (TDHS) 2004, resulting in a two wave data set.[1] With these data, we study the impact of women's economic empowerment, as measured in 2004, on women's reproductive health care use between 2004 and 2010. We focus on three important phases in the reproductive cycle: 1) before pregnancy, 2) during pregnancy, and 3)

at childbirth. Decisions made at each of these three phases can have far-reaching consequences for women's well-being and their families, as non-use of reproductive health care services can substantially increase women's vulnerability to reproductive health risks.

First, before pregnancy, family planning can reduce important risks for maternal morbidity and mortality by controlling the number and spacing of children (Cleland et al., 2006). Second, during pregnancy, antenatal care helps women identify danger signs and symptoms of health problems, and it also provides important medical care, such as tetanus toxoid immunization and the provision of iron tablets, folate supplements and malaria pills (WHO, 2003). Third, at childbirth, a major risk for maternal health is caused by home delivery. In East Africa home deliveries are rarely attended by a trained professional, so that complications are often belatedly recognized. This combined with long travel times and the lack of adequate transport means, makes it often impossible to receive timely emergency obstetric care at a hospital (Urassa et al., 1997).

According to our results, women who are economically active and women who contribute to their household's income visit a health centre for antenatal care check-ups more frequently. Women who contribute to their household's income are also less likely to deliver at home. The results remain robust with additional control variables, including controls for bargaining power and different types of selection bias. This provides evidence in support of policies that help women obtain access to income-earning activities, as this will benefit them in terms of a lower exposure to reproductive health risks.

II. Conceptual section

In this section, we firstly describe existing literature on the relationship between women's economic empowerment and reproductive health. Next, we discuss some of the most commonly used household models in the literature, and present three competing hypotheses.

2.1 Related literature

Several scholars have studied the influence of women's economic position on reproductive health by focusing on their asset ownership, their contribution to household income or their employment. A study from Indonesia found a positive relationship between female asset ownership and the use of prenatal and delivery care (Beegle, Frankenberg, & Thomas, 2001). Schuler and colleagues (1997) combined both female asset ownership and the contribution to household income into one indicator and found it is positively related to contraceptive use in Bangladesh. A study in Zimbabwe (Hindin, 2000) discovered that employment has a positive effect on five out of six family planning indicators, including the number of children and contraceptive use. Contrary to these three studies, Furuta and Salway (2006) found in Nepal that employed women who have control over their own earnings do not have a higher likelihood of receiving antenatal care or to have a skilled birth attendant present during the delivery.

From these studies we can conclude that, where a statistically significant effect is found, it supports the hypothesis that economic engagement is positively related to reproductive health. It is tempting to conclude on the basis of this evidence that if women are economically active they are less likely to be exposed to reproductive health risks. However, the results of these studies might suffer from endogeneity bias due to the use of cross-sectional data.[2] Importantly, it is also unclear what conceptual models were used in these studies. In our study, we attempt to tackle these shortcomings, by solving potential endogeneity biases and relying on an identification strategy that allows us to test competing hypotheses generated by different household models. This is important for policymaking as it provides insights on the mechanisms through which economic empowerment may lower women's reproductive health vulnerability.

2.2 Conceptual models and hypotheses

Most decisions that have an impact on women's reproductive health are made within the context of a household. However, there is no consensus in the literature about how such households are best conceptualized and different competing models exist. For a long time it was assumed that households pooled all resources and acted upon a common set of preferences (see e.g. the altruist model (G. S. Becker, 1974)). Recent empirical evidence, however, has rejected both assumptions of these 'common preference models' by showing that the control women have on household income clearly determines the pattern of household expenditures. For example, a higher control by women tends to lead to better child health, nutrition and child survival probabilities (Haddad & Hoddinott, 1994; Thomas, 1990).

In response to the growing dissatisfaction with common preference models, cooperative bargaining models have been elaborated that recognize the possibility that men and women in the same household have different preferences. In these models household members bargain over the allocation of economic resources determining their individual utility, and in case of disagreement they obtain a pay-off at a 'threat point'. The latter determines their bargaining power, as a higher utility obtained at the threat point allows one to enforce a bargaining solution that generates higher individual utility. There are two types of bargaining models, which differ on the threat points used. In so called 'divorce-threat models' (e.g. McElroy & Horney, 1981) the threat point exists outside marriage, represented by the utility obtained after divorcing. In the 'separate spheres' model of Lundberg and Pollak (1996) the threat point is a non-cooperative equilibrium within the marriage. With such marital non-cooperation each spouse contributes to public goods consumed by the entire household taking into account what the other spouse does, so that public goods are typically undersupplied (Bergstrom, Blume, & Varian, 1986).

How we conceptualize households has important implications for the hypothesized influence of women's economic empowerment on reproductive health outcomes (see Figure 1 for a diagram with our hypotheses). With 'common preference models', it should not matter who controls the resources and we would expect that women's economic empowerment does not influence reproductive health outcomes (hypothesis 1).[3] If preferences differ, however, women's economic empowerment should matter for reproductive health outcomes, leading to two additional alternative hypotheses that differ on whether men and women actually bargain about the allocation of economic resources.

The two bargaining models discussed above suggest that women obtain higher utility within their household if they have higher bargaining power. Their bargaining power in turn may depend on the share of income they contribute to the household. This brings us to hypothesis 2 according to which women's economic empowerment increases reproductive health through its positive influence on women's bargaining power. This is true in the 'divorce threat model' if we assume that women keep the same income sources after divorce or in the 'separate spheres' model if both spouses come to an agreement.[4]

However, if both spouses disagree (and decide not to divorce) we are at the non-cooperative equilibrium in the separate spheres model and bargaining should not matter anymore. Of course, men and women can still independently decide how much to allocate to public (and private) goods, and given women's stronger preference to spend recourses on (reproductive) health we expect women's economic empowerment to exert a direct influence on reproductive health (hypothesis 3).

Insert Figure 1 here

Which hypothesis is confirmed has important consequences for policy makers. If the results are in line with hypotheses 2 or 3, strengthening women's economic position could be an intervention strategy to improve reproductive health care uptake. However, finding evidence for an indirect effect through increased bargaining power (hypothesis 2) complicates the intervention design, compared to the design needed if a direct effect is found (hypothesis 3).[5] To test these hypotheses we estimate the effect of economic empowerment on reproductive health decisions with and without controls for women's bargaining power. If no effect is observed in both models, hypothesis 1 is confirmed. If we find a positive effect in the model without controlling for bargaining power, which disappears after controlling for bargaining power, hypothesis 2 is confirmed. If the effect of economic empowerment is found without controlling for bargaining power and remains robust after controlling for it, hypothesis 3 is confirmed.

III. Data and methods

In this section, we start with a short description of the study area. Thereafter, we describe the data collection and present the dependent variables, explanatory variables and control variables.

3.1 Study area

To investigate the influence of economic empowerment on women's reproductive health vulnerability, we selected the Lake Zone region (consisting of three regions bordering Lake Victoria: Kagera, Mwanza, and Mara) in Northern Tanzania as study site, a rural dominated area. Among the key assets of rural families in Tanzania are land, livestock and labour. In most areas, women are usually excluded from ownership or inheritance rights over land, yet, they work on average more hours on the land compared to men, representing distinct gender

roles (Ellis & Mdoe, 2003; Holmboe-Ottesen & Wandel, 1991). In 2004, 86 per cent of the women in the region were employed, most of them in agriculture (NBS, 2005), however most work is unpaid. The economic crises in the 1970s and 1980s have forced women to increase their economic participation, though, lack of spousal support and competing domestic responsibilities still limit the economic possibilities of women (Bryceson, 1995; IFC/WB, 2007; Koda, 1995). The increased economic engagement by women has resulted in an additional burden, but sometimes also in greater autonomy within their households. In a recent study, Vyas and colleagues (2014) characterized some Tanzanian households as cooperative, where income is pooled, yet others as non-cooperative. In the cooperative household models, women's income had a positive effect on bargaining power, as husbands appeared to be appreciative of the increased contribution to the household. According to others (Holmboe-Ottesen & Wandel, 1991; Ellis & Mdoe, 2003) men usually have authority in decision-making concerning food production and sale of food crops. Yet, as men are dependent on women's willingness to contribute their labour to the farm business, women are able to influence these decisions, hence bargaining processes seem to take place.

We selected the Lake Zone Region for this research, because contraceptive use is among the lowest in the country, and fertility rates and the proportion of home deliveries among the highest, resulting in high reproductive health vulnerability. Child mortality has rapidly declined since 1999, and Tanzania has a high coverage of antenatal care, but maternal mortality is amongst the highest in the world, as home deliveries are still common practice. To increase the proportion of births delivered at health centres, the Tanzanian government has set up an exemption scheme to reduce access barriers to quality care. However, this exemption scheme is not always consistently applied, especially the costs for caesarean-sections remain high (Quijada & Comfort, 2002). Emergency obstetric complications such as eclampsia and ante partum haemorrhage are important risk factors for maternal death, yet

these conditions can only be treated in hospitals, which are often difficult to reach by the rural poor (MoH, 2008). Fertility rates remain high with significant differences across regions and particularly high rates in the Lake Zone: 7.3 in Kagera, 6.3 in Mwanza and 7.0 in Mara (NBS, 2005). Couples do not always agree on the ideal family size, with husbands tending to prefer more children than women (Bankole & Singh, 1998). Hence, the question is who decides or whose preference has a greater impact. According to Mosha and colleagues (2013) men generally show a lack of interest to be involved in family planning issues, reflected by a lack of communication between spouses on the topic, yet they are considered the most important decision-makers. Similarly, a study by Pembe et al (2008) shows that husbands and relatives (especially the mother-in-law) are the main decision-makers in maternal referrals. To the contrary, Danforth and colleagues (2009) describe that when spouses disagree on the location of delivery, the woman's opinion is more influential in the final decision.

3.2 Data collection

To analyse the impact of economic empowerment on women's reproductive health vulnerability we re-interviewed women of the Tanzanian Demographic Health Survey (TDHS) in the Lake Zone region. In 2004, 1,226 women (aged 15-49) from 1,126 households were interviewed in this region. In the summer of 2010, we were able to re-interview 807 women (from 765 households), 65.8 per cent of the original sample. The survey in 2004 and 2010 collected information on topics such as education, employment, asset ownership, marriage, fertility, contraceptive use, antenatal and delivery care.

3.3 Dependent variables: contraceptive use, antenatal care and place of delivery

In all models, we analyse the influence of women's employment and contribution to their household's income as measured in 2004 on the use of reproductive health services as

measured between 2004 and 2010 (or at the time of the interview in 2010 in case of contraceptive use). Hence, as empowerment levels are measured *before* reproductive health outcomes, we limit endogeneity issues due to inverse causality.

We estimate three different regression models, each corresponding to one phase in the reproductive cycle. First, we analyse the influence of employment and contributing to the household's income on the use of contraceptive methods. As dependent variable we use a binary variable equal to one if women were using a (modern or traditional) contraceptive method at the moment of the interview in 2010. Second, we study the influence of economic empowerment on the use of antenatal care, measured by the number of antenatal care visits during the last pregnancy (between 2004 and 2010). Third, we are interested in the impact of empowerment on the place of delivery. Home deliveries are rarely attended by a health professional. Health staff at dispensaries and health centres are able to assist a normal delivery, but emergency obstetric care is only provided at hospitals. Accordingly, we distinguish three categories for place of delivery: at home or on the way, at a local health facility (dispensary or health centre) and at a hospital.

3.4 Explanatory variables: economic empowerment and bargaining power

In all models, we use the same set of explanatory variables. We use two measurements of economic empowerment.[6] First, we distinguish three categories of employment: not working, working at home, and working away from home. Women who work away from home are more likely to have greater mobility, improving their accessibility to health facilities. Alternatively, working women might be hampered in accessing health facilities due to a time constraint. Second, we measure women's income contribution using the question: 'On average, how much of your household's expenditures do your earnings pay for?' Answer categories range from (almost) none to (almost) all. Due to low number of observations in the

middle categories, we recoded this variable into a dummy: women who do not contribute to the household income score a zero; contributing some to (almost) all is represented by a one.[7] Women who are not working, or are not paid are coded a zero.

As explained before, bargaining power might be an important intermediary variable. It is closely related to women's agency in the household. Hence, to proxy bargaining power, we use indicators that measure women's involvement in intra-household decision-making (NBS, 2005). We create the variables 'domestic decision-making' and 'control over money'. For the first variable, we asked who in the family has the final say on decisions in four daily situations (small household purchases, large household purchases, visits to family or relatives, and the food to be cooked each day). Answer categories are recoded into dummy variables reporting a zero if the respondent was not involved and a one if the respondent made the decision solely or jointly with her husband or someone else.[8] Next, we calculate a factor score (using maximum likelihood factor analysis, selecting the first factor) based on the four reported answers.[9] The survey included a fifth item: decisions regarding your own health care. As including this item would tend to result in a tautology, and as the item did not link as well with the other items (strongly reducing the Cronbach's alpha), we decided to eliminate this item. For the second variable, the question was posed 'Do you yourself control the money needed to buy the following (food, clothes, medicines, and toiletries)?' For this variable answer categories are limited to yes or no. A factor score is calculated to combine the four items.[10]

3.5 Control variables

To avoid omitted variable bias, we include control variables at the individual, household, and community level that we expect to correlate with women's economic empowerment and to exert an independent effect on the dependent variables. According to the literature, the

following variables possibly correlate with both women's economic empowerment and reproductive health: age, number of previous births and previous pregnancy loss (Bryceson, 1995), education and education of husband (see Abadian, 1996; Lindelow, 2008; Odutolu, Adedimeji, Odutolu, & Baruwa, 2003), religion (Kabeer, 1999), media exposure (Rogers et al., 1999), presence of the husband and nature of the marriage (Wong & Levine, 1992), wealth (WB, 2012), region, and remoteness of the community (Holvoet, 2005).[11]

IV. Results

We firstly present descriptive statistics of the most important variables used in our analyses. Thereafter, we present the estimated effects of women's economic empowerment at three different phases in the reproductive cycle. For each analysis, we estimate three models. Model 1 only includes women's employment. In Model 2, we add women's income contribution as explanatory variable, after which we add the two indicators of bargaining power in Model 3 and in Model 4 we add the control variables. Finally, we correct for possible selection bias by estimating Heckman models and applying inverse probability weighting.

4.1 Descriptive statistics

Table 1 presents descriptive statistics of the variables used. We observe that in 2010, just over 20 per cent of the women in our sample were using a contraceptive method, either modern (approximately 17 per cent) or traditional (approximately 4 per cent). As to antenatal care, about 90 per cent of the Tanzanian women in our sample received antenatal check-ups. The average number of visits per pregnancy was 3.5, with 49 per cent of the women receiving at least four check-ups, as recommended by the WHO, which is significantly lower than the

national percentage of 62 (WHO, 2011). We also observe that of the women in our sample who had at least one pregnancy between 2004 and 2010, slightly over 50 per cent delivered at home. Around 30 per cent delivered at a dispensary or health centre, and the remaining 20 per cent gave birth at a hospital. Over 50 per cent of the women who gave birth at home stated that it was not their intention to deliver there. For the women who gave birth at a hospital or a local health facility these figures are roughly 12 and 7 per cent, respectively. This is in line with the assumption that women have a preference for using reproductive health services, but apparently experience certain constraints in acting upon this preference. These constraints could be financial or geographical barriers or could point to the intra-household decision-making process.

Insert Table 1 here

Almost all women in the sample are economically active (97.46 per cent, mostly in agriculture, weighted sample). However, only approximately 15 per cent of the women contribute to the household income (which is similar to the national average), as most perform unpaid work. Roughly 44 per cent of the sample works at home, and 53 per cent away from home. Yet, women who contribute to the household income are more likely to work away from home, compared to the women who do not contribute.[12] Although the full sample is married or cohabitating, not all spouses live in the same household. Among the women who contribute financially to the household, slightly more husbands are living elsewhere: 13.9 versus 10.9 per cent. However, the proportion of female headed households is the same among both groups (both slightly under ten per cent). The women in the 15 per cent category are on average slightly wealthier (significant at 5 per cent level) compared to other women.

As hypothesis 2 assumes a relation between economic empowerment and bargaining power it is useful to have a closer look at the association between these two domains of empowerment. Almost all women who make a (substantial) contribution state that they have control (either joint or alone) over their own income. However, this does not necessarily lead to control over household expenses (for food, clothes, medicines, and toiletries), shown by the lack of a significant correlation.[13] Women who are not working or working at or close to home do have more control over expenses, compared to women who are working away from home. In contrast, women who contribute to the household income score significantly higher on the intra-household decision-making index, as expected. Yet, employment does not show any correlation to intra-household decision-making. All variables are measured in 2004, hence no causal chain can be determined.

In sum, women who contribute to the household income usually have some control over their own income, but it does not automatically lead to control over household expenditure. Employment even relates to a reduced control over money expenses. The economic contribution made by women is associated with increased bargaining power as measured by the intra-household decision-making index.[14]

4.2 The influence of women's income contribution on reproductive health

Table 2 presents the results of the regression models on the likelihood of contraceptive use. In addition to the variables presented above, we control for women's need of a family planning method (in 2010), by adding variables that indicate whether women were (still) fecund and whether they were pregnant or amenorrheic. Employment does not relate to contraceptive use, as shown by model 1. The results of model 2 show that women who contribute to their household income are 13 per cent more likely to use contraceptive methods, compared to women who contribute nothing, rejecting hypothesis 1. This direct effect remains present –

and becomes even stronger – after controlling for bargaining power (model 3), which rejects hypothesis 2 and supports hypothesis 3. Unexpectedly, we find that intra-household decision-making has a negative influence. The effect is rather small though. The coefficient for the standardized score is -0.031, indicating that an increase of one standard deviation on the index score results in a 3.1 per cent lower chance of using contraceptive methods. Finally, we observe that after adding control variables (model 4) the effect of economic empowerment disappears. Control over household expenditure becomes significant in model 4. It shows the expected positive effect.

In sum, based on model 4, employment and contributing to the household income does not exert a direct effect on contraceptive use. The effect of bargaining power is mixed: control over household expensed does increase the chance of using contraceptive methods, but intra-household decision making shows the opposite effect. For the estimated coefficients of the control variables see Table A1 in the online Appendix.

Here, we have taken the use of traditional and modern contraceptive methods together. Yet, it could be argued that there is an important difference between the two types of methods. Traditional methods (e.g. periodical abstinence, withdrawal) are less reliable and more importantly, access is not restrained by financial limitations, nor physical distance to a facility. On the other hand, traditional methods usually require cooperation from both spouses, while several modern contraceptives can be used covertly. When running the analysis with modern contraceptive use as dependent variable, the results remain the same. Running the analyses with traditional contraceptive methods as dependent variable results in minor differences: women working at or close to home are slightly less likely to use traditional methods compared to women who are not economically active, or those who are working away from home. Control over money has a small positive effect (tables available

upon request). However, caution should be made in making firm conclusions based on these results, as only four per cent of the women uses traditional contraceptives.

Insert Table 2 here

Table 3 reports the estimated influence of female empowerment on the number of ANC visits during the last pregnancy.[15] Similar to the analyses on contraceptive use, we find that women's contribution to the household's income has a positive effect on the use of antenatal care. Model 2 shows that women who pay for (some of) the household's expenses receive on average 0.789 more pregnancy check-ups, compared to women who do not contribute at all.[16] The direct effect of economic empowerment remains intact after adding the bargaining power indicators in model 3, which is in line with hypothesis 3. The effect is also robust to adding control variables (model 4). Employment does show a positive effect as well. Women who work at or close to home are more likely to receive antenatal care, compared to women who are not working at all. The effects remain robust throughout all models. In model 4, the indicator representing women who work away from home also shows a positive effect. Both indicators of bargaining power do not show any effect.

Insert Table 3 here

We also studied the relationship between economic empowerment and the place of delivery, presented by Table 4.[17] The first four models report the marginal probabilities of delivering at a health facility (hospital, dispensary or health centre) versus delivery at home. A comparison between hospital delivery and deliveries elsewhere (home delivery or delivery

at a dispensary or a health centre) is presented in the last four models. When comparing the models, we conclude that the effects differ slightly for the different types of delivery places.

Employment is not related to delivering a child at a health facility. Yet, model 2 indicates that, on average, women who contribute to the household's income have a 35 per cent higher chance to deliver at any health facility compared to women who do not contribute. As this effect remains robust in all models, and, in particular, is of similar size in models 3 and 4, hypothesis 3 is supported. Control over household expenses does show a robust positive effect as well, the coefficient of intra-household decision-making is not significant.

Insert Table 4 here

The likelihood of delivery at a hospital (versus at other health facilities or at home) is also influenced by women's contribution to household income, resulting in a 22.5 per cent higher probability to deliver at a hospital (Model 2). Again, the direct effect remains intact after adding the bargaining power indicators (model 3), confirming hypothesis 3. Employment does not show a similar strong effect. Only in the full model, employment is significant at the ten per cent level: women who are working away from home are more likely to deliver at a hospital, compared to unemployed women. Similar to the analysis on contraceptive methods, domestic decision-making exerts a negative influence on delivering at a hospital.

In sum, our results indicate that economic empowerment reduces women's vulnerability at two out of three stages in the reproductive cycle. Women who contribute to their household's income receive on average more antenatal care check-ups and are less likely to deliver at home, and women who work at or close to home are more likely to receive antenatal care. As the effects of the financial contribution made to the household is stronger

in most models (except for ANC), it can be concluded that the share of household resources is more important than labour itself in predicting health seeking behaviour.

4.3 Correcting selection bias

Estimates may be biased because of three potential sources of non-randomness in our sample that are correlated with women's economic empowerment. First, we managed to re-interview slightly over 65 per cent of the original sample. If women's economic empowerment is correlated with the likelihood to be selected in our sample (because more empowered women more likely migrated or were working elsewhere at the moment of our survey, for example) attrition bias might affect the estimation of the empowerment effects. Second, as empowerment is foremost a relational factor we limited the sample to women who were married in both 2004 and 2010. This selection could lead to an additional selection bias, if economic empowerment is correlated with divorce and/or marriage. Third, to analyse antenatal care and child delivery, having had a pregnancy since 2004 is a prerequisite, and consequently some women were not included. If the likelihood of being pregnant is correlated with empowerment (Bryceson, 1995), such selection may lead to an additional bias.

To obtain a first idea about possible non-random selection and hence possible biases, we perform three tests. Whereas the economic contribution made to the household does not seem to be correlated with selection, employment does. Furthermore, some other variables – including bargaining power – differ between attritors and non-attritors, and seem to explain same of the variation in (non-)selection. Based on the BGLW-test we can reject the null hypothesis that selection is random (Baulch & Quisumbing, 2011; Outes-Leon & Dercon, 2008). More information about the three tests can be found in the online Appendix.

Insert Table 5 here

To correct for possible selection bias, we apply and compare two methods: a Heckman model and Inverse Probability Weights. Both models use additional (exogenous) variables to estimate selection, yet the latter relaxes the assumption of exogeneity. For a more detailed description of the analyses, see the online Appendix.

Table 5 summarizes the results for the four dependent variables. Both the Heckman model as well as the IPW-model, do not change the lack of effect of the financial contribution made to the household on contraceptive use. However, in the IPW-model, employment has a negative effect on contraceptive use. Regarding ANC visits, the Rho-statistic from the Heckman model tells us that selection bias might be present. Yet, the effect of women's economic empowerment (both employment and income contribution) remains significant. In the IPW-model, the effect of one employment category disappeared. In explaining child delivery at any health facility, we find an insignificant Rho-statistic in the Heckman model, indicating a lack of selection bias, which is supported by the robust coefficients of economic empowerment in both models. In the final model – explaining delivery at a hospital – the effect of economic contribution to the household is not statistically significant anymore in the Heckman model, while working at home suddenly shows a strong negative effect. However, in the IPW-model, the results remain robust.

In sum, in five out of eight models the results remain unchanged after controlling for selection bias. In two models, the main effects change in the Heckman models, but remain robust when applying IPW, in one model a small difference is found when applying IPW (for the full models see Tables A4 to A6 in the online Appendix).

V. Discussion and conclusion

In this article, we studied the role of economic empowerment on women's exposure to reproductive health risks in Northern Tanzania. We explored the effect of women's employment and income contribution to their household on health care use at three important phases in the reproductive cycle: before pregnancy, during pregnancy and at child birth. In contrast to most evidence that is based on analyses of cross-sectional data, we made use of data from 2004 and 2010, which allows us to obtain estimates that are less prone to endogeneity biases. Moreover, we rely on an identification strategy that allows us to obtain insights into the mechanisms through which economic empowerment may lower women's reproductive health vulnerability.

We found that women who are economically active visit a health centre for antenatal care check-ups more frequently. Women who contribute to the household's income have on average a more frequent use of antenatal care and are less likely to deliver at home. Adding two indicators of bargaining power to the model did not alter the direct effect of making an economic contribution to the household. The significant effect of economic empowerment on contraceptive use disappeared after adding all control variables. We made use of Heckman models and inverse probability weights to control for possible selection and attrition bias. In most models the effect remained robust.

These results convincingly reject hypothesis 1, according to which economic empowerment would not have any influence on reproductive health outcomes. This hypothesis was inspired by common preference household models, which assume that households pool all resources and act upon a common set of preferences. The strong association between women's contribution to the household income and their reproductive health vulnerability that we observed goes against these views.

Our results are not in line with hypothesis 2 either. In most models, the effect of economic empowerment remains robust (and of similar size) after controlling for bargaining power. If economic empowerment worked through increased bargaining power, we would see a decline in the size of the effect of economic empowerment when adding controls for bargaining power. The results on health seeking behaviour during pregnancy and at delivery support the idea that economic empowerment has a direct effect on health care seeking behaviour, confirming hypothesis 3. Women are likely to spend their own income directly on their own health care without bargaining, which is in line with the non-cooperative model.

Although our results point to a non-cooperative household model, we have been unable to test the assumptions behind this model. We have limited information about women's preferences for health seeking behaviour and even less so for their husbands. As such, we are unable to compare the preferences of the spouses with the final decision made. In addition, we measure bargaining power indirectly by two proxies. These two indicators even show some mixed effects, indicating that the concept – and especially the process – of bargaining power is difficult to grasp. Yet, a closer analysis of the pathways and interrelationships between various sources or indicators of empowerment falls outside the scope of this paper. We also acknowledge that the measurement of economic empowerment in this paper is limited, as it only focuses on economic engagement and the contribution to the household income and as it does not allow a comparison between different scales of contribution. As this study was conducted in a predominantly rural area, where most women perform unpaid work in agriculture, it would be interesting to repeat this study in a more urban area with a higher diversity in income sources.

Despite some limitations, our results provide useful insights for policy makers. To lower women's reproductive health vulnerability, it is not necessary to work on women's bargaining position, as becoming economically more important as such can have direct

beneficial effects for women's vulnerability to reproductive health risks. Any policy that increases women's access to income generating activities has therefore the potential to effectively lower women's reproductive health vulnerability.

Notes

[1] A research permit from the Tanzanian Commission for Sciences and Technology (COSTECH) and an ethical clearance from the Muhimbili University for Health and Allied Sciences (MUHAS), as well as consent from regional and district officers were obtained. The Tanzanian National Bureau of Statistics provided the information required to revisit the women interviewed in 2004. The data collected in 2010 is authorized by MUHAS. Prior to the interview, regional officers of the NBS visited the enumeration areas to ask for permission and to track the women to be interviewed. The respondents were first informed by their local leaders and asked for consent. At the start of the interview, consent was asked again by the researchers.

[2] It is realistic to assume that reproductive health may also have an impact on women's contribution to the household income. Storeng et al. (2008), found in Burkina Faso that near-miss pregnancy complications put strain on intra-household relations. Women with near-miss complications often felt responsible for the depletion of income (due to high health costs) and were blamed for it. In response many women tried to minimise spending on their own needs and often tried to become self-sufficient by resuming income generating activities, domestic and agricultural work often before they felt physically ready for it.

[3] It should be noted that feminist scholars would probably come to a similar hypothesis, but they would not attribute it to a common set of preferences among household members, but rather point to a lack of control over the earnings and the resilience of gender ideologies (for example Kabeer, 1997).

[4] The assumption in the divorce-threat bargaining model that women keep the same income sources after divorce is also recognized by Lundberg and Pollak (1996: 146-147) who state: "If divorcing partners maintain ownership of income received separately within marriage, the demands emerging from marital bargaining will depend not on total family income but on the income received by the husband and income received by the wife".

[5] Although we analyse various types of household model, and power dynamics are likely to change if women increase their income share, we do not suggest policies to intervene with these dynamics as such.

[6] We acknowledge that working and earning an income are only two of the possible channels to establish empowerment.

[7] This decision leads to a loss in precision. However, the number of observations in the middle categories are too low. We have run analyses with different categories, and concluded that the current distinction is the best reflection.

[8] An alternative would have been to focus on sole decision making by the respondent. This correlates strongly with the indicator used in the analyses (.6671). Running the analyses with the alternative indicator does lead to minor differences in the results, but the main effect of economic empowerment remains intact. Results available upon request.

[9] Cronbach's alpha on these four items is .8593. The loading on the factor is between .6379 and .8518.

[10] Cronbach's alpha is .9200, with factor loadings between .7571 and .9302.

[11] Although we have tried to limit omitted variable bias as much as possible, it remains a potential concern as long as earning an income is not randomized. One possible omitted attribute might be related to personality characteristics of the women.

[12] Working away from home does not necessarily mean being formally employed. It also includes women who work on land located further away from the home. Among the 15 per cent who contributes to the household financially, the largest share (70 per cent) works in agriculture.

[13] We expected that women who earn an income are also more likely to control household expenses as it is (partly) their money to be spent, hence this result is rather unexpected. It might be explained by the indicators of employment: women who are not working or working at home have the highest control over money. Most likely, they are in charge of daily businesses at home.

[14] It is rather unexpected that women's economic contribution is significantly correlated with decision making but not with control over household expenses, despite that some household decisions have financial implications (small and large household purchases). However, the decision making index is broader than pure financial decisions (including the decision *what* to buy).

[15] Ordinary Least Square regression results are preferred over Poisson regression for interpretation purposes. Poisson regression leads to similar results.

[16] Based on a White test we conclude that there is no indication of heteroskedasticity in the analyses based on the year of pregnancy. See the online Appendix for more details.

[17] Likelihood-ratio test suggests that there is no heteroskedasticity based on the year of pregnancy (details can be found in the online Appendix).

References

Abadian, S. (1996). Women's Autonomy and Its Impact on Fertility. *World Development, 24*(12), 1796-1809.

Agarwal, B. (1997). "Bargaining" and Gender Relations: Within and Beyond the Household. *Feminist Economics, 3*(1), 1-51.

Bankole, A., & Singh, S. (1998). Couples' Fertility and Contraceptive Decision-Making in Developing Countries: Hearing the Man's Voice. *International Family Planning Perspectives, 24*(1), 15-24.

Baulch, B., & Quisumbing, A. (2011). *Testing and Adjusting for Attrition in Household Panel Data*. CPRC Toolkit Note. Chronic Poverty Research Centre.

Becker, G. S. (1974). A theory of Social Interactions. *Journal of Political Economy, 82*(6), 1063-1094.

Becker, S. (1996). Couples and Reproductive Health: A Review of Couple Studies. *Studies in Family Planning, 27*(6), 291-306.

Beegle, K., Frankenberg, E., & Thomas, D. (2001). Bargaining power Within Couples and Use of Prenatal and Delivery Care in Indonesia. *Studies in Family Planning, 32*(2), 130-146.

Bergstrom, T. C., Blume, L., & Varian, H. (1986). On the private provision of public goods. *Journal of Public Economics, 29*, 25-49.

Bryceson, D. F. (1995). Gender Relations in Rural Tanzania: Power Politics or Cultural Consensus? In C. Creighton & C. K. Omari (Eds.), *Gender, Family and Household in Tanzania* (pp. 37-69). Aldershot: Avebury.

Cleland, J., Bernstein, S., Ezeh, A., Faundes, A., Glasier, A., & Innis, J. (2006). Family Planning: The Unfinished Agenda. *The Lancet: Sexual and Reproductive Health*, 1-18. doi: 10.1016/S0140-6736(06)69480-4

Danforth, E. J., Kruk, M. E., Rockers, P. C., Mbaruku, G., & Galea, S. (2009). Household Decision-making about Delivery in Health facilities: Evidence from Tanzania. *Journal of Health, Population and Nutrition, 27*(5), 696-703.

Ellis, F., & Mdoe, N. (2003). Livelihoods and Rural Poverty Reduction in Tanzania. *World Development, 31*(8), 1367-1384.

Furuta, M., & Salway, S. (2006). Women's Position Within the Household as a Determinant of Maternal Health Care Use in Nepal. *International Family Planning, 32*(1), 17-27.

Haddad, L., & Hoddinott, J. (1994). Women's income and boy-girl anthropometric status in the Côte d'Ivoire. *World Development, 22*(4), 543-553.

Haddad, L., Hoddinott, J., & Alderman, H. (1997). Introduction: The Scope of Intrahousehold Resource Allocation Issues. In L. Haddad, J. Hoddinott, & H. Alderman (Eds.), *Intrahousehold Resource Allocation in Developing Countries. Models, Methods, and Policy* (pp. 1-16). Baltimore, Maryland: The Johns Hopkins University Press.

Hindin, M. J. (2000). Women's Autonomy, Women's Status and Fertility-Related Behaviour in Zimbabwe. *Population Research and policy Review, 19*, 255-282.

Holmboe-Ottesen, G., & Wandel, M. (1991). Men's contribution to the food and nutritional situation in the Tanzanian household. *Ecology of Food and Nutrition, 26*(1), 83-96.

Holvoet, N. (2005). The Impact of Microfinance on Decision-Making Agency: Evidence from South India. *Development and Change, 36*(1), 75-102.

IFC/WB. (2007). Tanzania Gender and Economic Growth Assessment: International Finance Corporation (IFC) / World Bank Group.

Kabeer, N. (1997). Women, Wages and Intra-Household Power Relations in Urban Bangladesh. *Development and Change, 28*, 261-302.

Kabeer, N. (1999). Resources, Agency, Achievements: Reflections on the Measurement of Women's Empowerment. *Development and Change, 30,* 435-464.

Koda, B. O. (1995). The Economic Organization of the Household in Contemporary Tanzania. In C. Creighton & C. K. Omari (Eds.), *Gender, Family and Household in Tanzania* (pp. 139-155). Aldershot: Avebury.

Lindelow, M. (2008). Health as a Family Matter: Do Intra-household Education Externalities Matter for Maternal and Child Health? *Journal of Development Studies, 44*(4), 562-585.

Lundberg, S., & Pollak, R. A. (1996). Bargaining and Distribution in Marriage. *The Journal of Economic Perspectives, 10*(4), 139-158.

McElroy, M. B., & Horney, M. J. (1981). Nash-bargained household decisions: toward a generalization of the theory of demand. *International economic review, 22*, 333-349.

MoH. (2008). *The National Road Map Strategic Plan To Accelerate Reduction of Maternal, Newborn and Child Deaths in Tanzania 2008-2015*.

Mosha, I., Ruben, R., & Kakoko, D. (2013). Family Planning Decisions, Perceptions, and Gender Dynamics among Couples in Mwanza, Tanzania: a Qualitative Study. *BMC Public Health, 13*. doi: 10.1186/1471-2458-13-523

NBS. (2005). Tanzania demographic and health survey 2004/2005. Dar Es Salaam: National Bureau of Statistics and ORC Macro.

Odutolu, O., Adedimeji, A., Odutolu, O., & Baruwa, O. (2003). Economic Empowerment and Reproductive Behaviour of Young Women in Osun State, Nigeria. *African Journal of Reproductive Health, 7*(3), 92-100.

Outes-Leon, I., & Dercon, S. (2008). Survey Attrition and Attrition Bias in Young Lives. Technical Note No. 5. Oxford: Young Lives.

Pembe, A. B., Urassa, D. P., Darj, E., Carlstedt, A., & Olssen, P. (2008). Qualitative study on maternal referrals in rural Tanzania: Decision making and acceptance of referral advice. *African Journal of Reproductive Health, 12*(2), 120-131.

Quijada, C., & Comfort, A. (2002) Maternal Health Financing Profile: Tanzania. *Working Paper No. 003*. Bethedsda MD: The Partners for Health Reformplus Project, Abt Associates Inc.

Rogers, E. M., Vaughan, P. W., Swalehe, R. M. A., Rao, N., VSvenkerud, P., & Soo, S. (1999). Effects of an Entertainment-Education Radio Soap Opera on Family Planning Behavior in Tanzania. *Studies in Family Planning, 30*(3), 193-211.

Schuler, S. R., Hashemi, S. M., & Riley, A. P. (1997). The Influence of Women's Changing Roles and Status in Bagladesh's Fertility Transition: Evidence from a Study of Credit Programs and Contraceptive use. *World Development, 25*(4), 563-575.

Simwaka, B. N., Theobald, S., Amekudzi, Y. P., & Tolhurst, R. (2005). Meeting Millennium Development Goals 3 and 5. Gender Equality Needs to be Put on the African Agenda. *BMJ, 331*, 708-709.

Storeng, K. T., Baggaley, R. F., Ganaba, R., Ouattara, F., Akoum, M. S., & Filippi, V. (2008). Paying the Price: The Cost and Consequences of Emergency Obstetric Care in Burkina Faso. *Social Science & Medicine, 66*, 545-557.

Thomas, D. (1990). Intra-household resource allocation: an inferential approach. *Journal of Human Resources, 25*(4), 635-664.

Urassa, E., Massawe, S., Lindmark, G., & Nyström, L. (1997). Operational Factors Affecting Maternal Mortality in Tanzania. *Health policy and planning, 12*(1), 50-57.

Vyas, S., Mbwambo, J. K. K., & Heise, L. (2014). Women's Paid Work and Intimate Partner Violence: Insights from Tanzania. *Feminist Economics*. doi: 10.1080/13545701.2014.935796

WB. (2012). World Development Report 2012: Gender Equality and Development. Washington DC: The World Bank.

WHO. (2003). Antenatal Care in Developing Countries: Promises, achievements and missed opportunities. An analysis of trends, levels and differentials, 1990-2001. Geneva: World Health Organization.

WHO. (2011). United Republic of Tanzania: Health Profile. Geneva: World Health Organization.

Wong, R., & Levine, R. E. (1992). The Effect of Household Structure on Women's Economic Activity and Fertility: Evidence from Recent Mothers in Urban Mexico. *Economic Development and Cultural Change, 41*(1), 89-102.

Tables and Figures

Figure 1. Hypotheses

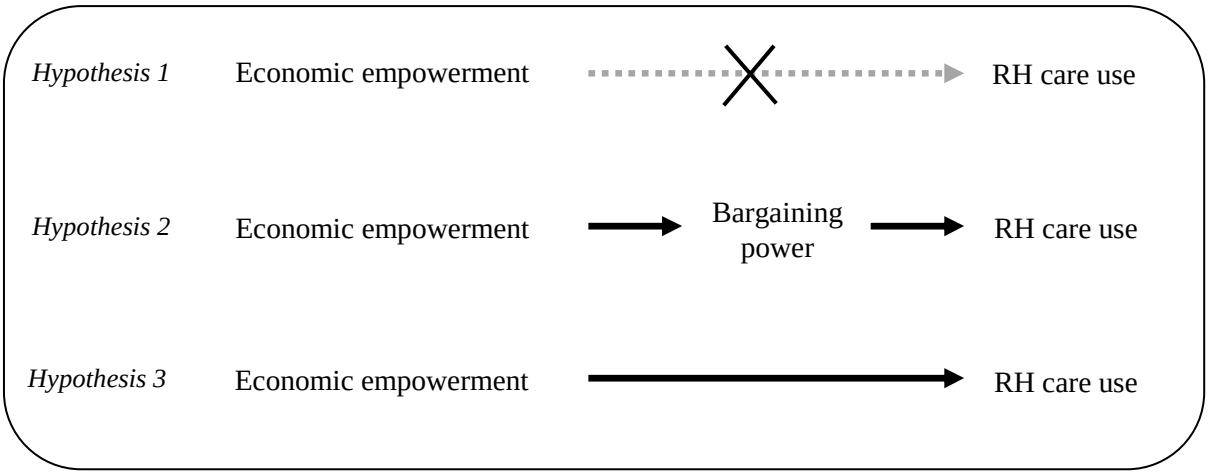

Table 1. Descriptive statistics

	Mean	St. Dev.	Min.	Max.
Dependent variables (2010)				
Current contraceptive use	.215	.411	0	1
Number of ANC received	3.492	1.844	0	12
Delivery at home	.501	.500	0	1
Delivery at dispensary or health centre	.299	.458	0	1
Delivery at hospital	.200	.400	0	1
Empowerment indicators (2004)				
Contribution to household income	.146	.353	0	1
Not working	.025	.158	0	1
Working at home	.444	.497	0	1
Working away from home	.531	.499	0	1
Domestic decision-making	-.081	.908	-.845	1.362
Control over money	-.060	.947	-1.050	1.059
Control variables (2004)				
Age	15.182	8.426	0	34
No education	.283	.451	0	1
Incomplete primary	.168	.374	0	1
Complete primary or higher	.544	.498	0	1
Moslem	.096	.295	0	1
Catholic	.450	.498	0	1
Protestant	.319	.466	0	1
Not religious	.135	.342	0	1
Media exposure	.650	.477	0	1
Number of births	4.110	2.756	0	13
Previous pregnancy loss	.200	.400	0	1
Husband does not live in same HH	.106	.308	0	1
No polygynous marriage	.722	.448	0	1
Polygynous marriage – ranked 1st wife	.124	.330	0	1
Polygynous marriage – ranked lower	.154	.361	0	1
Education husband (years)	5.653	3.039	0	18
Wealth	-.308	.664	-.851	3.773
Infecund (in 2010)	.267	.443	0	1
Pregnant or amenorrheic (in 2010)	.169	.375	0	1
Road passable throughout the year	.606	.489	0	1
Availability public transport	.571	.495	0	1
Region: Kagera	.355	.479	0	1
Region: Mwanza	.436	.496	0	1
Region: Mara	.209	.407	0	1

Notes. Weights applied to adjust for the original two-stage sampling design; sample limited to women married in both 2004 and 2010.

Table 2. The likelihood of current contraceptive use

	Model 1	Model 2	Model 3	Model 4
Contribution to household income		.130*** (.054)	.184*** (.059)	.014 (.028)
Not working	ref	ref	ref	ref
Working at/close to home	-.048 (.088)	-.063 (.086)	-.068 (.089)	-.003 (.060)
Working away from home	-.095 (.089)	-.118 (.090)	-.114 (.096)	-.021 (.063)
Domestic decision-making			-.068*** (.020)	-.035*** (.013)
Control over household expenses			.005 (.017)	.024** (.010)
Control variables	No	No	No	Yes
N	500	500	496	477
Wald chi2	1.98	8.89	18.46	669.32
Prob > chi2	.3715	.0307	.0024	.0000
Pseudo R2	.0037	.0147	.0340	.3910
Log pseudolikelihood	-258.97	-256.12	-249.80	-149.35

Notes. Probit regression (marginal probabilities reported) with robust standard errors (between brackets) to control for intra-village dependencies. Weights applied to adjust for the original two-stage sampling design. Model 3 controls for age, education, polygyny, presence of husband, religion, media exposure, number of births, previous pregnancy loss, wealth, fecundity, need for family planning (pregnancy and amenorrheic period), remoteness of the community, and region. Two-sided p-values * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table 3. Determinants of the number of antenatal care visits

	Model 1	Model 2	Model 3	Model 4
Contribution to household income		.789*** (.227)	.832*** (.263)	.552** (.249)
Not working	ref	ref	ref	ref
Working at/close to home	1.058** (.454)	.968** (.463)	.923** (.453)	1.236*** (.408)
Working away from home	.595 (.444)	.465 (.448)	.422 (.443)	.750** (.350)
Domestic decision-making			-.187 (.145)	-.076 (.148)
Control over household expenses			-.035 (.090)	.005 (.111)
Control variables	No	No	No	Yes
Constant	2.706*** (.402)	2.706*** (.403)	2.700*** (.391)	1.552** (.693)
N	368	368	365	351
F (Wald chi2)	3.35	7.48	4.19	2.65

Prob > F (Prob > chi2)	.0430	.0003	.0029	.0021
R-squared	.0197	.0414	.0466	.1278

Notes. OLS regression with robust standard errors (between brackets) to control for intra-village dependencies. Weights applied to adjust for the original two-stage sampling design. Model 3 controls for age, education, polygyny, presence of husband, religion, media exposure, number of births, previous pregnancy loss, wealth, remoteness of the community, and region. Two-sided p-values * p < 0.10; ** p < 0.05; *** p < 0.01.

Table 4. Determinants of the place of delivery

	Delivery at health facility versus home delivery				Delivery at hospital			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Contribution to household income		.349*** (.058)	.373*** (.062)	.310*** (.076)		.225*** (.074)	.281*** (.078)	.141** (.077)
Not working	ref	ref	ref	ref	ref	ref	ref	ref
Working at/close to home	-.290 (.192)	-.328 (.188)	-.313 (.189)	-.058 (.145)	-.147 (.104)	-.171 (.101)	-.159 (.100)	.035 (.070)
Working away from home	-.243 (.182)	-.296 (.179)	-.266 (.184)	-.031 (.145)	-.064 (.099)	-.100 (.103)	-.064 (.104)	.116* (.075)
Domestic decision-making			-.053 (.035)	-.044 (.039)			-.051* (.027)	-.073*** (.026)
Control over household expenses			.063** (.031)	.075** (.036)			.060** (.030)	.032 (.022)
Control variables	No	No	No	Yes	No	No	No	Yes
N	369	369	366	352	369	369	366	352
Wald chi2	2.13	28.20	30.36	121.99	3.14	18.33	25.02	222.72
Prob > chi2	.3451	.0000	.0000	.0000	.2075	.0004	.0001	.0000
Pseudo R2	.0062	.0504	.0643	.1932	.0134	.0462	.0817	.2385
Log pseudolikelihood	-254.19	-242.87	-237.35	-196.75	-181.98	-175.94	-168.08	-129.40

Notes. Probit regression (marginal probabilities reported) with robust standard errors (between brackets) to control for intra-village dependencies. Weights applied to adjust for the original two-stage sampling design. Model 3 controls for age, education, polygyny, presence of husband, religion, media exposure, number of births, previous pregnancy loss, wealth, remoteness of the community, and region. Two-sided p-values * p < 0.10; ** p < 0.05; *** p < 0.01.

Table 5. Heckman models versus inverse probability weights

	Contraceptive use		ANC		Delivery at health facility		Delivery at hospital	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Contribution to household income	.112 (.207)	.003 (.018)	.543** (.253)	.668*** (.234)	.759*** (.233)	.414*** (.060)	.354 (.224)	.115** (.070)
Not working	ref	ref	ref	ref	ref	ref	ref	ref
Working at/close to home	-.086 (.579)	-.048** (.025)	2.440*** (.657)	1.493** (.671)	-.446 (.401)	.082 (.205)	-.746** (.372)	.048 (.062)
Working away from home	-.217 (.582)	-.078*** (.036)	1.966*** (.612)	.824 (.592)	-.416 (.419)	-.013 (.208)	-.485 (.412)	.114* (.069)
Domestic decision-making	-.279*** (.087)	-.031*** (.012)	-.214 (.169)	.064 (.176)	-.062 (.107)	-.034 (.050)	-.121 (.142)	-.055** (.022)
Control over household expenses	.192** (.087)	.016 (.008)	-.055 (.107)	.004 (.134)	.192** (.082)	.082** (.040)	.141* (.084)	.015 (.017)

N	1107	477	1110	351	1111	352	1111	352
Wald chi2	735.98	759.39	55.92	8.67	142.01	129.15	180.03	138.43
Prob > chi2	.0000	.0000	.0001	.0000	.0000	.0000	.0000	.0000
Log pseudolikelihood	-1200.97	-121.61	-1885.10	-	-1162.14	-181.24	-1059.63	-104.05
Rho	-.019 (.434)	-	.726 (.174)	-	-.428 (.304)	-	-.902 (.167)	-
Wald test rho. Prob>chi2	.9644	-	.0123	-	.2193	-	.0978	-

Notes. Models 1 report results from Heckman analyses. Models 2 apply inverse probability weights. All control variables included. Two-sided p-values * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.