Endowments or Discrimination? Determinants of Household Poverty in Egypt

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By

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Abstract

This paper investigates whether there is feminization of poverty in Egypt and examines the determinants of poverty by household type. Furthermore, it decomposes the poverty differential between the various household types into a component due to endowments and another due to the return to these endowments. The paper uses data from five Household Income, Expenditure and Consumption Surveys, that span a period of far reaching economic, social and political changes, from 1999 to 2013. Results suggest that female headed households are indeed poorer than male headed households over the period. They are however, less poor than married couple households. Initially endowments were more important in explaining the poverty differentials between the various family types, however in more recent years the returns to these endowments, or the treatment effect, became the dominant factor. This suggests the need for policies to ensure more equitable returns to endowments for the poor.

Keywords: Feminization of poverty, discrimination, poverty decomposition, Egypt

JEL Classifications: I3, O1, J7

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1. Introduction

The measurement and analysis of poverty in Egypt has long been approached at the household level, without particular attention to the prevalence and change over time in gender poverty. Feminization of poverty is said to exist when: (1) female headed households are over-represented among the poor and (2) there is a trend whereby the composition of the poor is changing to include more female-headed, or more generally, female-maintained, households over time. The term "feminization of poverty" was first coined by Sociologist Diana Pearce (1978) when she studied poverty in the United States in the post war period and made the then startling discovery that the incidence of poverty among female maintained households had doubled, rising from less than a quarter of the poor to more than half in a relatively short period of time. Pearce (2011) has argued that this phenomenon, which has now been confirmed for a large number of countries, and time periods, is more than just a "demographic shift". The stronger implication is that gender-being female- can now be considered a prime *cause* of poverty.

According to official statistics, poverty in Egypt has been rising steadily over the last 15 years, from 16.7% in 1999/2000 to 26.2% in 2012/2013 (CAPMAS 2013). Does this increasing poverty also have a gender dimension? How did female headed households fare during this period of deteriorating social welfare? If female-head households (FHH) are poorer, what are the underlying reasons behind their poverty? If they are poor because of less favorable endowments: income generating assets such as land, credit, physical, human capital, or technology, then policy interventions can focus on trying to provide them with more equal access to these assets, or more widespread opportunities to acquire them. If however, their poverty is due to discrimination, or even if female headed households are not poorer but still face less favorable "treatment" in society or the labor market that make the returns to their existing assets lower than their male-headed (MHH) or

married-couple (MCH) counterparts, then policy should focus on achieving more equitable returns to assets for all groups in society.

This paper contributes to the literature by investigating whether there is feminization of poverty in Egypt. Furthermore, I develop and estimate a model of the determinants of poverty for different household types, and then decompose the poverty differential into a portion that is due to differences in endowments, and another that is due to differences in the return to these endowments, in the spirit of the Oaxaca (1973) and Blinder (1973) decomposition that is common in the labor literature. To preview the main results of the paper, I find that FHH are poorer than MHH, but less poor than MCH over the period 1999 to 2013. Family characteristics, education level of the head and the head's sector of employment, are all important determinants of poverty, and their importance varies by household type. The poverty decompositions indicate that female headed households would have been less poor if they had the same endowments of MHH or MCH, and that the portion of the poverty differential that is due to discrimination is rising over time.

2. Related Literature

There is little disagreement that women often have less access to income generating assets such as land, credit, physical and human capital, and technology. At the same time women typically face greater time constraints since they have to fulfill multiple roles within the household both in home production activities as well as domestic roles such as child care and housekeeping (Gammage 1998). They face a wide, and sometimes increasing earnings gap with respect to men, sometimes due to 'pure' discrimination in pay and in access to higher paying jobs[1] , but often also due to their lower education levels, restricted access to land and to credit (Buvinic and Gupta 1997). The widespread

[1] See AlAzzawi (2014) for a survey of the literature on wage discrimination and an in depth analysis for Egypt.

support for the existence of gender inequalities in asset ownership and labor market rewards and the existence of these multiple challenges for women has often made it "deceptively easy" to assert that female headed households also form a greater proportion of those below an acceptable benchmark standard of living (Gammage 1998).

There is less consensus on the *existence* of "feminization of poverty", however. Out of 65 studies covering Africa, Asia and Latin America and the Caribbean, Buvinic and Gupta (1997) found that in 38 of these studies FHH were overrepresented among the poor, while 15 others found that their poverty was associated with certain characteristics of the female heads, or for some, but not all poverty indicators.

Other authors have challenged this notion and argued that the evidence in favor is at best week. Chant (2003) surveys results from studies for Latin America, Asia and Africa that failed to find a consistently higher rate of FHH in poverty(for example Menjívar and Trejos, 1992 on Central America; Fuwa, 2000 on Panama; Gafar, 1998 on Guyana; GOG, 2000 on The Gambia; Kusakabe, 2002 on Cambodia; Wartenburg, 1999 on Colombia).

Chant argues that the nature of the "female headedness", i.e. the particular route into this status (whether by widowhood, divorce or migration of the male spouse for example), combined with the specific cultural, social and demographic contexts within any one country can have a big impact on the position of these women along the socio-economic ladder and hence closely affect their prospects for being poor. The age of the female head, the number of other income earners in the household compared to the non-earner dependents, the marital status and whether the household receives "remittances" from non-resident family members will all matter for the poverty designation and the change in that designation over time.

A few studies have investigated the gender dimension of poverty in Egypt in the 1990s (Nassar 1997, Datt et al. 1998, El-Laithy 2001).The most recent of these El-Laithy (2001) used data from the 1999/2000 Household Income, Expenditure and Consumption Survey, and primarily focused on the relative poverty of females compared to males (not female-headed households). She found that there was a slightly higher incidence of poverty rate for females: being female raised the probability of being poor by 2.3 percent in urban areas and by 4.8 percent in rural areas, while female headed households actually fared slightly better than those headed by males. She found that non-income indicators such as education, labor force participation and sector of employment differ more widely between males and females, and argued that these are the most important determinants of poverty.

There is a growing body of recent literature that documents the deteriorating status of women in Egypt in recent years. AlAzzawi (2010) and AlAzzawi and Said (2012), using panel data for 1998 and 2006 to analyze the degree of income and non-income mobility, found that females tend to be "stuck" in the lower end of the distribution more often than males, both by income and by job quality measures. Several labor market studies have also documented an increase in the gender pay gap (AlAzzawi 2014; El-Hamidi 2008; Kandil 2009), especially in manufacturing, as well as widespread occupational segregation (El-Hamidi and Said 2008). This is combined with a continuous decline in female labour force participation, both in the formal and informal sectors (Assaad 2002) over the last two decades. The 2014 Global Gender Gap Report published by the World Economic Forum ranked Egypt at 131 out of 142 countries surveyed in economic participation, and 129 overall[2] (Hausmann et al. 2014).

[2] The survey ranks countries' gender gap performance in the areas of economic participation and opportunity, educational attainment, health and survival, and political empowerment.

A small number of studies have investigated the importance of endowments vs discrimination in the poverty context. Rodgers (1994) performed this analysis for the USA for 1980, and found that discrimination was more important. Bibi and Chatti (2010) decomposed poverty in Tunisia by household type using data for 1990 and 2000. They found that endowments were initially more important in explaining the poverty differential, but by 2000 discrimination was more important.

3. Data and Limitations

This paper relies on data from five rounds of the Household Income, Expenditure and Consumption Surveys (HIECS). Surveys are available for 1999/2000, 2004/2005, 2008/2009 2010/2011 and most recently 2012/2013. These surveys provide a rich source of information on household expenditure, and income, as well as various household and individual characteristics for the different household types. In analyzing poverty, each type of welfare measure has its advantages and disadvantages. Incomes are in some cases more accurately reported than expenditures since they are easier to recall. Consumption on the other hand may be a better indicator of permanent income when households exercise consumption smoothing, which is common among the poor (Deaton 1997). Consumption measures can however be subject to gender biases that results in more accurate reporting for FHH since females are both the main income earner as well as the one responsible for household purchases. Wives in larger, MHH might report expenditures less accurately due to the larger household size, and incomplete information about income and expenditures of all members, especially the male's expenditures. This would incorrectly imply higher expenditures in the FHH, while underreporting in those maintained by males and could result in artificially lower rates of poverty of FHH. In this paper I will use expenditure data to determine poverty rates, and to understand the determinants of this poverty and how it has changed over time. Estimates based on

income data are very similar and are not shown to save on space. These are available from the author upon request.

Complications: Female-Headed versus Maintained Households, and Remittances

An important issue in this line of analysis rests on the definition of a female headed household. This may not be as straight forward as the survey designation of 'head' (referred to as the "de jure" head). The term "head" carries strong connotations about decision making power within the household that has traditionally been given to the oldest male member whether or not they are the main breadwinners of the household. This is certainly problematic in the case of Egypt especially, where the traditional patriarchal system may preclude the designation of the female as head in the presence of a disabled adult male or a son (regardless of age) for example, even if the woman is the main income earner in the household. Gammage (1998) found that using the maintenance designation resulted in markedly higher percentage of Female maintained households (FMHs) in the sample, as well as higher incidence of poverty for them in El Salvador and Costa Rica.

Household type, whether single headed or a married couple, can be used to refine our definition of FHH vs MHH in the data, in the absence of better information. One would expect that households with married couples, whether MHH or FHH, face different challenges and constraints from single head families, regardless of the gender of the head. For example, a household with a married couple will be able to find work outside the house more easily, since one of the two spouses can take care of the children or elderly in the working spouse's absence. Ideally, I would have preferred to further split those Married Couple Households (MCHs) into those that are female maintained, and those that are male maintained. I handle this issue in a companion paper, currently

in progress, that uses labor market in addition to the HIECS data to determine poverty based on the maintenance criteria.

Another complication arises from the presence of large numbers of households where one spouse might be working overseas and sending home remittances that are the main source of income for the household, which is quite common in Egypt. If the overseas spouse is the male, it is not clear how the household head question might be answered: the remaining spouse might designate herself as the household head in the absence of the husband, but in other cases she might not. This can underestimate poverty among "true" female headed households, i.e. where the female head does not rely on others for support, but is the main breadwinner of the family. In the surveys, remittances are the major source of income for 40% to 50% of FHH for all years.

However, the survey lumps together those who receive remittances from domestic and overseas sources. This complicates matters as such remittances might be alimony or payments to support an elderly mother who is living on her own. Unfortunately, the data does not allow any further breakdown of the income source category. Questions about the type of work of both the head and the spouse are asked in the survey, and working overseas is one of the possible answers in the survey responses. One solution to handle this issue would have been to eliminate FHH that responded that their spouse worked overseas, since arguably these are not female maintained households. However, none of the cases in the survey report this as the type of work, neither for the head nor the spouse. The data also does not provide any other information from which one can infer the amount of remittances from abroad and hence make an attempt to take this into consideration.

4. Empirical Methodology:

Developing the Poverty Benchmark: Updating the Poverty Lines

The first step in any poverty study is to determine the poverty line(s) that will be used to identify the poor. I use poverty lines from World Bank (2007) for 2004/2005 deflated or inflated to the prices of each survey year (deflated to 1999/2000, or inflated to 2008/2009, 2010/2011, 2012/2013)[3]. The CPI for food and non-food items is used for rural and urban regions, separately, to make the poverty line updates. These poverty lines are calculated based on the cost-of-basic-needs methodology, and account for differences in consumption patterns and prices across regions. The cost of the actual diet consumed by Egyptians of different ages and classes, not a hypothetical one based on caloric requirements, is used to calculate these poverty lines. The Food Poverty Line (FPL) reflects the cost of the food bundle using the relative quantities observed in the diet of the poor (as proxied by the second quintile), and the prices they actually faced. Individuals and households whose consumption was below the FPL will be referred to as "extreme poor" (World Bank 2007). The Poverty Line (PL) was constructed by allowing for expenditure on essential non-food items in addition to the FPL. Specifically, the share of non-food expenditure was set to equal that of households whose *total* expenditure is at the food poverty line. This is designed to capture the extent of "non-food essentials" since households would have to *give up* some of their basic food needs to afford these non-food items. The Upper Poverty Line (UPL) was calculated by setting the non-food share to equal that of households whose *food* expenditure is equal to the food poverty line[4]. I will use the lower poverty line, PL, to make all poverty measurements and regression

[3] The World Bank published an updated version of the poverty assessment for Egypt in 2011, however the report does not provide details of the poverty lines calculated by region, only for all Egypt. The method followed here is very similar to their chosen method of updating the 2004/2005 poverty lines. When similar methodology is applied on the stated all Egypt 2008/2009 poverty line (in 2008/2009 prices) to update it to the respective survey year prices, the obtained poverty lines are almost identical to the poverty lines calculated for all Egypt using the methodology followed in this paper.

[4] There is an important discussion in the World Bank (2011) most recent poverty assessment update for Egypt about the complexity and representativeness of this system of poverty lines and the methodology used to update it. The authors

estimates in this paper, but results using the FPL and UPL are very similar and were omitted to save on space.

Table 1 lists the values for the all items CPI and the Food and Beverages subcomponent for the years of interest. Inflation was relatively low in Egypt between 1999/2000 and 2004/2005, with the CPI for all items rising by about 32.5 % over the 5 year period, on average for urban and rural areas. This amounts to an average annual rate of about 6.5%. The change in the Food CPI was also very similar, and prices rose less in rural areas.

By contrast, between 2004/2005 and 2008/2009 the CPI for all items rose 52.5 % (urban and rural average) over the 4 year period. This amounts to an average annual rate of about 13.5%. Food prices rose much faster over this period, and have continued to rise until the most recent year 2012/2013 at a faster rate than the all items CPI. Food prices had become very volatile during the 2007-2008 period. World food prices were rising dramatically due to sharp declines in supply after a series of droughts around the world, and the simultaneous rising demand from biofuels in the face of rising oil prices. World food prices fell in 2009 and 2010 but rose again in 2011 to even higher levels than 2007/2008 (FAO 2014). Between 2004/2005 and 2012/2013, the CPI index for all items more than doubled with prices rising slightly faster in rural areas, while that for Food and Beverages almost tripled over this period.

Given these changes in price levels, it was important to update the poverty lines provided in the World Bank's Poverty Assessment Update (2007) after carefully accounting for these price

argue that the PL represents "the minimal defensible threshold of total consumption" since the FPL is just too low to sustain a person given that it does not allow for any non-food requirements. They also argue that the UPL is a much more consistent concept of basic needs since it reflects a subsistence minimum level of both food and non-food items, taking a more realistic view of human needs. The UPL is also barely at the $2 a day measure which is more justifiable for a country like Egypt. In this study I will rely mainly on the PL as benchmarks, results based on the FPL and the UPL are available from the author upon request.

differentials both between urban and rural, and especially between food and non-food items given that the poor spend most of their income on food. I have updated the poverty lines by using the Food CPI for the FPL, and using the non-food CPI for the non-food components of the other two poverty lines (as measured by the difference between the PL and FPL and that between the UPL and FPL). This gave more justifiable poverty lines than would have resulted by simply using the all items CPI for all poverty lines. I chose to update the poverty lines rather than the income/ expenditure variables, but either method should give equivalent results. Table 2 summarizes the poverty lines by region, reflecting the differences in prices and consumption patterns across regions and over time.

Identifying the State and Structure of Female Poverty

I will use the Foster-Greer-Thorbecke (FGT), or the P_a class of poverty measures, to calculate poverty for the population as a whole as well as for FHH, MHH and MCH, separately.

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{H}\left(\frac{Y_p - Y_i}{Y_p}\right)^\alpha \quad (1)$$

where N is the population, H, is the number of poor, Y_p is the poverty line, Y_i is the individual income of those who are poor, and $\alpha \geq 0$ is a parameter. If $\alpha=0$, the index simplifies to the headcount index, if $\alpha=1$, it simplifies to the normalized poverty gap, if $\alpha=2$ it gives the severity of poverty measure. Each of these measures provides an important dimension into poverty's state and structure, and calculating the difference between these measures for FHH and MHHs (MCHs) over time will provide insight into the determinants of poverty in Egypt, and whether this is changing over time.

In particular, the difference in poverty between FHH and MHH (or MCH) is given by

$$\Delta P_\alpha(Y_i, Y_p) = P_\alpha^{FHH}(Y_p) - P_\alpha^{MHH}(Y_p) \qquad (2)$$

and feminization of poverty is said to exist if this is increasing over time:

$$P_{\alpha,t}^{FHH}(Y_p) - P_{\alpha,t}^{MHH}(Y_p) > P_{\alpha,t-1}^{FHH}(Y_p) - P_{\alpha,t-1}^{MHH}(Y_p) \qquad (3)$$

Table 3 presents results of the FGT poverty levels by household type and year for rural and urban households separately. Clearly rural poverty is higher than urban poverty for all categories. FHH are poorer than MHH, while MCH have the highest incidence of poverty for all years. Poverty increased considerably in 2008-2009, but has since fallen slightly, although still not to pre-2008 levels.

The determinants of gender poverty in Egypt: Endowments or Discrimination?

Female headed households might not be poorer than married couples, however this finding might be misleading to policy makers. Different household types face distinct endowments, constraints and returns to assets. This might lead FHH to make choices that maximize their current welfare, and hence appear non-poor. The descriptive statistics show that even though FHH are generally smaller in size than MCH, they have roughly the same number of earners. If women face discrimination in the labor market, i.e. lower return to endowments, or lower endowments to start with, they might for example, decide to take an older child out of school at an early age to help augment family income. This will falsely lead to the impressions that this FHH is non-poor when in fact the discrimination, combined with their lower endowments, make them much worse off than other household types. This type of decision can reinforce poverty, not only for the present, but for the children over the long run.

In this section, I estimate the determinants of poverty for different household types. Furthermore, I decompose the observed differences in the probability of being poor into a portion that is due to differences in the endowments of these households, such as education, experience,

sector of employment; and that due to their facing unequal returns to these endowments in the labor market, i.e. discrimination. This approach is similar to that of Oaxaca (1973) and Blinder (1973) that is common in the gender discrimination labor market literature.

The first step is to estimate separate welfare functions for each household type. One would expect poverty to be affected by family characteristics, such as household size, number of children, and number of earners, as well as characteristics of the household head such as education, age, employment status, occupation, and employment sector, which will ultimately determine their income-earning ability. I estimate a reduced form probit model in which the independent variables are those described below, and the dependent variable is a binary variable that takes the value of 1 if the household is poor by the Poverty Line (PL) for that year. The probit model is as follows:

$$\Pr(Y_{ij} = 1) = \Phi(\beta_j' X_{ij}) \quad (4)$$

where:

$Y_{ij} = 1$ if the ith household of type j is poor;

$Y_{ij} = 0$ if the ith household of type j is not poor;

X_{ij} is a vector of exogenous variables for the ith household of type j;

β_j is a vector of parameters for all households of type j;

Φ is the cumulative normal distribution

If poverty is independent of household type, then the β_j in equation (4) will be identical for FHH, MHH and MCH. Otherwise, at least one element of β_j will be different and hence the differences in the levels of the exogenous variables are not enough to explain poverty for the different household types. In this case, family type itself is a determinant of poverty.

The exogenous variables that are likely to affect the probability of being poor can be divided into two groups. The first group of variables focus on the households' earning ability, and the

second on the households' demographic composition that will ultimately determine its needs. We expect earning ability to depend on several factors, including the age of the household head and its square, the household head's education level, occupation, work status and sector of employment. Education is measured by six categories: Illiterate, Read & Write, Primary and Lower Secondary, General Secondary, Vocational Secondary, Post-Secondary, and University & Above. Occupation is classified as either white collar (which includes Legislators, Senior Officials and Managers, Professionals, Technicians and Associate Professionals, Clerks and Service workers) or blue collar (which includes Skilled Agricultural and Fishery workers, Craft and related trades workers, Plant and Machine Operators, and Assemblers, Elementary occupations and all others). Work status is classified as employed, unemployed or out of the labor force. Sector of employment is classified as agriculture and mining, manufacturing or services.

The household's demographic characteristics are captured by the number of children under 15, the number of adults over 65, and the household size. It is important to control for these variables as they affect both the household's consumption needs relative to its income, and also affect the decision /ability to participate in the workforce, thereby affecting family earning potential. The region of residence is also controlled for in the regression. Different regions within Egypt face different labor market conditions. Region of residence also affects lifestyle and accordingly households' needs. In the regressions the omitted variables are university& above, white collar, employed, agriculture and mining, and the metropolitan region.

5. Poverty and Household Type: Results of the Estimated Model

Means and standard deviations of the exogenous variables in the model, by family type and year are presented in Table 4. The household head tends to be older in FHH, than both MHH and MCH. In terms of household composition, MCH have the highest number of children 14 and

younger, followed by FHH, and MHH have the smallest number. This pattern is reversed for adults 65 and older: MHH have the most, followed by FHH, while MCH have the lowest. Dependency ratio (measured as the sum of the number of children under 15 and the number of adults over 65, divided by the number of working age adults in the household) is also highest for MCH, followed very closely by FHH, then MHH has the lowest ratio. In 2010-2011 FHH had the highest dependency ratio.

While the educational level of household heads has been increasing over time, female heads are still overrepresented among the illiterate and underrepresented at all other education levels, compared to the average for the population as a whole. The majority of female heads are out of the labor force, a category that includes homemakers, students and pensioners. More detailed disaggregation (not shown to save on space) shows that in fact the majority of female heads are in the pensioners' category, followed by homemakers as the second most important category. By contrast, the majority of heads in MHH and MCH are employed in all years.

The majority of heads of FHH are blue collar workers (most of whom are skilled agricultural and fishery workers in more detailed disaggregation), and this share has fallen slightly over time. For MHH and MCH, the share of blue collar is also higher than white collar workers, but lower than for FHH. The majority of female heads work in agriculture, while the majority of heads of both MHH and MCH are in the services sectors. The share of female heads in services has been rising over time, however.

The proportion of FHH also differs vastly by region. In most years lower rural Egypt was where the majority of FHH resided. However, the share of FHH in Upper Rural Egypt increased over time. Interestingly, rural areas had more FHH than Metropolitan and other urban regions in most years. MCH are also concentrated in rural areas (by design the HIECS surveys have slightly more rural than urban households sampled), but MHH are concentered in the Metropolitan cities.

Table 5 presents the results of the probit regressions for the three household types by year. The results are fairly typical with all coefficients having the expected results in all years. Households with older heads are less likely to be poor, those with more children and larger households in general are more likely to be poor. The number of adults 65 and older was not significant in most cases, except for male headed households in 2010, where it has a negative effect on poverty.

Education variables have the expected effect. The omitted category is university and above, and hence these coefficients show the effect of education attainment on poverty relative to those with a university degree or above. The less educated the household head is, the more likely the household is poor. For example, heads that are illiterate raise the probability of being poor the most compared to those with a university degree and above.

For the main activity status of the household head, being employed is the omitted category. Results indicate that being unemployed raises the probability of being poor (it has a positive coefficient whenever it enters significantly), relative to being employed. For female headed and married couple households being out of the labor force (i.e. a student, homemaker or pensioner) is also associated with a higher probability of being poor, relative to being employed. For male headed households however, being out of the labor force has a negative sign whenever it is significant. A plausible explanation for this is that male heads who are pensioners are more likely to have enough income to stay out of the labor force, especially that they have fewer dependents as shown by the descriptive statistics.

The occupation of the household head was divided into two groups, blue collar and white collar as explained above. White collar is the omitted category in the regressions. The coefficient on blue collar is significant in only a few cases. Results imply that relative to white collar workers, blue

collar married couple heads are more likely to be poor, while in 2012 female headed blue collar working heads were less likely to be poor. In all other years it was insignificantly different from zero. The coefficient on blue collar head is negative and significant in 1999 for male headed households indicating that these were less likely to be poor in that year than white collar workers. In all other years it was insignificantly different from zero.

Working in agriculture and mining is the omitted sector of employment. Working in manufacturing is associated with a lower probability of being poor compared to the reference category, whenever the coefficient is significant. Working in services is associated with a higher probability of poverty for FHH, while it is associated with a lower probability of poverty for married couples, compared to the agriculture and mining category. It is insignificantly different from zero for male headed households in all years.

The omitted region is the metropolitan cities (Cairo, Alexandria, Port Said and Suez). Poverty is higher in rural Upper Egypt than in the metropolitan cities for all types of households except male headed in 2010. Poverty is lower in both rural and urban Lower Egypt than in the metropolitan cities for all types of households. The probability of being poor in urban Upper Egypt, compared to metropolitan cities, depends on household type: male headed households in urban Upper Egypt are significantly less likely to be poor than their counterparts in metropolitan cities, while both female headed and married couple households are more likely to be poor.

Expected poverty rates, when the exogenous variables equal their mean values for each household type, are provided in the third line from the bottom in Table 5. In 2008, for example, a female headed household with the mean characteristics (values for the exogenous variables) had a 10.1% probability of being poor, a male headed household had a 9.87% probability while a married couple household had a 20.6% probability of being poor. To put this in perspective, the actual

proportion of poor was 16.6%, 12.8% and 24.5%, respectively. The difference between actual proportion poor and predicted probability given the mean characteristics is almost always largest for female headed households. The last row of the table gives the percent of correct predictions that the model makes[5].The percent of correct predictions is very high for all family types and years, ranging from a high of 95.7% to a low of 80.17%. It appears that each of the three equations fits the data quite well. For example, in 2004, the equation for female headed households correctly predicts about 90% of the cases, that for male headed households, 94%, and that for married couples 85%, of the cases.

6. Poverty Rate Differentials: Endowments or Discrimination?

In the previous section we saw that the exogenous variables explain the probability of being poor quite well. There were significant differences in coefficient magnitudes, and in some cases signs, among the three family types, however. Recall that the means of the exogenous variables also varied among the three family types (see Table 4). Ideally, we would like to understand the degree to which poverty of a given family depends on its characteristics (the endowment effect), and the degree to which it depends on treatment of the household head in a different way due to gender (the treatment or discrimination effect). In this sense I am using a methodology that is common in the labor literature to determine whether women's wages are lower than men's due to mean characteristics or due to labor market discrimination. In the poverty context, I will decompose the poverty rate differential between female-headed(f) and either male-headed or married-couple (m)

[5] Following convention, an observation is classified as having a predicted positive outcome if its predicted probability is > 0.5.

households, computed at mean levels of the exogenous variables (see Table 5) into a portion that is due to differences in endowments, and another that is due to differences in treatment.:

$$\Phi(\hat{\beta}_f{}'\bar{X}_f) - \Phi(\hat{\beta}_m{}'\bar{X}_m) = \underbrace{[\Phi(\hat{\beta}_f{}'\bar{X}_f) - \Phi(\hat{\beta}_f{}'\bar{X}_m)]}_{E1} + \underbrace{[\Phi(\hat{\beta}_f{}'\bar{X}_m) - \Phi(\hat{\beta}_m{}'\bar{X}_m)]}_{D1} \quad (5)$$

or

$$\Phi(\hat{\beta}_f{}'\bar{X}_f) - \Phi(\hat{\beta}_m{}'\bar{X}_m) = \underbrace{[\Phi(\hat{\beta}_m{}'\bar{X}_f) - \Phi(\hat{\beta}_m{}'\bar{X}_m)]}_{E2} + \underbrace{[\Phi(\hat{\beta}_f{}'\bar{X}_f) - \Phi(\hat{\beta}_m{}'\bar{X}_f)]}_{D2} \quad (6)$$

Where $\hat{\beta}$ is a vector of coefficient estimates, $\bar{X}$ is the mean value of the exogenous variables for a household of type (f): female headed, or (m) male headed or married couple. E1 and E2 measure the portion of the poverty rate differential that is due to differences in the average levels of the exogenous variables. D1 and D2 measure the portion that is due to differences in the return to endowments (the coefficients on the exogenous variables). In equation (5) the reference group (assumed to face nondiscriminatory treatment in the Oaxaca (1973) and Blinder (1973) decomposition terminology) is the female headed household, while in equation (6) it is the male headed or the married couple household.

Table 6 presents the decomposition into endowment and discrimination effects from equations (6) and (7) for the poverty differential between female headed and male-headed households by year. Table 7 presents the same for the poverty differential between female headed and married couple households by year. Recall that poverty rates were higher for FHH than MHH households in the data for all years. Thus the positive poverty differential is the difference of the rate by which the model predicts poverty given mean characteristics for FHH, and that for MHH. In

most years, decomposition using equation (5) implies a larger role for endowments, while that using equation (6) implies a rising, and, after 1999, larger role for coefficients in explaining the poverty differential. Turning to FHH vs MCH in Table 7, recall that poverty was lower for FHH than MCH in the data for all years. This table thus decomposes the lower FHH poverty into a component due to more favorable endowments, and another due to more favorable coefficients for FHH. For most years, both equations imply that FHH faced lower poverty due to more favorable coefficients.

E1 predicts the rate by which the poverty rate for female headed households would have been higher than male-headed (married-couple) households if male-headed (married couples) were treated the same as female-headed households (i.e. had coefficients equal to those of female-headed households), and each household had their own mean level of the exogenous variables. For example, in 1999 the poverty rate for female headed households would have been 3.39 (2.31) percentage points higher than that of male headed (married couple) households, rather than the 0.74 (-4.97) poverty rate differential predicted by the model. In other words, female headed households would have been poorer if they had the same endowments as MHH(MCH).

D1 predicts the rate by which the poverty rate for female headed households would have been higher than male-headed (married-couple) households if female headed households had the mean endowments of male-headed (married-couple), and each household had its own coefficients. For 1999 for example, female headed households would have had a poverty rate of 2.65 (7.28) percentage points *less* than male-headed (married-couple) households, rather than 0.74 higher for male-headed households (and 4.97 percentage points less than married couples). This means that female headed households would have been a lot less poor if they were treated the same as male-headed (married-couple) households.

E2 predicts the rate by which the poverty rate for female headed households would have been higher than male-headed (married-couple) households if female-headed households had the same coefficients as male-headed (married couples) (i.e. were treated the same as them), and each household had their own mean level of the exogenous variables. For 1999 for example, female headed households would have had a poverty rate that was 2.24 (-1) percentage points higher than that of male headed (married couple) households, rather than the 0.74 (-4.97) poverty rate differential observed in the data. In other words, female headed households would have been poorer if they had the same endowments as male headed or married couple households.

D2 predicts the rate by which the poverty rate for female headed households would have been higher than male-headed (married-couple) households if male-headed (married-couple) had the mean endowments of female-headed households, and each household had its own coefficients. In 1999, female headed households would have had a poverty rate that was *lower* than male-headed (married-couple) by 1.5 (3.97) percentage points, rather than 0.74 percentage points higher (4.97 percentage points lower) for male-headed (married-couple).

For the years 1999-2000 to 2010-2011, the decomposition given by equation (5) implies that most of the poverty differential between female-headed and male-headed households is due to more favorable endowments of male-headed households rather than more favorable coefficients for them. In 2012-2013 however, the D1 component is positive and is very close in magnitude to the E1 component, indicating that the 8.49 percentage point poverty differential between female-headed and male-headed households is equally attributable to more favorable endowments and to more favorable coefficients for male headed households. The decomposition given by equation (6) points to a different interpretation, with the discrimination component being larger in all years after 1999-2000, than the endowment component. This indicates that if female headed households had been

treated the same as male-headed their poverty rates would have been substantially less than observed. This is especially evident in 2012-2013 when the discrimination component is more than 90% of the poverty differential. In general, the trend is for rising importance of the discrimination component as an explanation for FHH relative to MHH poverty over time. When comparing FHH and MCH poverty over time the trend also suggests a higher importance for more favorable coefficients that FHH face compared to MCH.

7. Conclusion and Policy Recommendations

This study has investigated whether there is feminization of poverty in Egypt, and furthermore, estimated a model to determine the probability of poverty by household type. The estimated probability was then decomposed into a component due to characteristics of the household-i.e. endowments, and another to the treatment or discrimination effect.

Results suggest that FHH are poorer than MHH, however, MCH are the most poor for all years. Results of the probit regressions are fairly typical implying that household size and composition have an important impact on the probability of being poor. Other characteristics of the household head are also important determinants of poverty, in particularly education and sector of employment.

Results of the decomposition analysis suggest an initially low role for discrimination in explaining poverty differentials between FHH and MHH. However this share has increased over time. FHH are less poor than MCH, and the decomposition also points to the more favorable "treatment" that FHH receive compare to MCH. These results suggest the need for a broad policy effort to both raise FHH's endowment levels, as well as reduce the level of discrimination that they, and all the poor, face in society and especially the labor market.

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Table 1: CPI and Food and Beverages CPI for Urban and Rural Areas, 1999/2000 to 2012/2013 fiscal annual average. Jan 2010=100

	All Items CPI		Food CPI	
	Urban	Rural	Urban	Rural
1999/2000	44.7	43.95	34.2	35.15
2004/2005	59.2	58.55	50.1	50.15
2008/2009	89.4	90.3	84.3	87.2
2010/2011	110.9	111.8	120.3	118.9
2012/2013	128.8	132.1	145.4	144.6

Source: CAPMAS, CPI Bulletin, various issues

Table 2: Annual per capita Poverty Line by region, in survey year prices.

Region	1999/2000	2004/2005	2008/2009	2010/2011	2012/2013
Metropolitan	1023.2	1453.4	2371.556	3263.49	3906.4
Lower Egypt Urban	988.8	1403	2286.821	3142.681	3760.5
Lower Egypt Rural	1023.6	1429.2	2398.447	3185.083	3844.4
Upper Egypt Urban	998.2	1416.3	2308.475	3172.4	3796.0
Upper Egypt Rural	1007.6	1408.3	2367.53	3148.267	3801.5

Source: Author's calculations based on poverty lines in World Bank(2007), deflated/inflated to survey year prices using the CPI and Food CPI, for urban and rural separately (see text for details.)

Table 3 Poverty Rates by Household Type, 1999-2000 to 2012-2013.

	Female Headed Households (Rural)			**Female Headed Households (Urban)**		
	PL			PL		
	P_0	P_1	P_2	P_0	P_1	P_2
99/00	0.2518	0.0422	0.0104	0.0707	0.0128	0.0035
04/05	0.2210	0.0425	0.0131	0.0873	0.0176	0.0050
08/09	0.3541	0.0799	0.0270	0.1630	0.0335	0.0114
10/11	0.3432	0.0690	0.0212	0.1547	0.0307	0.0090
12/13	0.2849	0.0653	0.0229	0.1248	0.0220	0.0061
	Male Headed Households (Rural)			**Male Headed Households (Urban)**		
	PL			PL		
	P_0	P_1	P_2	P_0	P_1	P_2
99/00	0.2111	0.0357	0.0093	0.0476	0.0076	0.0018
04/05	0.1680	0.0255	0.0047	0.0246	0.0046	0.0015
08/09	0.3868	0.0832	0.0262	0.1098	0.0189	0.0052
10/11	0.1660	0.0146	0.0024	0.1063	0.0219	0.0066
12/13	0.2594	0.0496	0.0123	0.0272	0.0059	0.0018
	Married Couple Households (Rural)			**Married Couple Households (Urban)**		
	PL			PL		
	P_0	P_1	P_2	P_0	P_1	P_2
99/00	0.2731	0.0513	0.0141	0.0779	0.0138	0.0039
04/05	0.2754	0.0521	0.0149	0.1050	0.0193	0.0056
08/09	0.4101	0.0921	0.0305	0.1703	0.0340	0.0106
10/11	0.3818	0.0828	0.0263	0.1637	0.0342	0.0105
12/13	0.3301	0.0686	0.0220	0.1552	0.0267	0.0075

Source: Author's calculations from HIECS data.

Table 4 Means and Standard Deviations of Variables by Family Type and Year.

	1999-2000						2004-2005					
	FHH		MHH		Married Couple		FHH		MHH		Married Couple	
	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
Age head	52.74	14.07	47.55	20.05	46.33	12.84	52.77	14.66	48.25	19.65	45.48	12.96
Child<15	0.87	1.32	0.5	1.13	1.78	1.52	0.63	1.1	0.29	0.97	1.53	1.38
Adults>65	0.28	0.46	0.38	0.51	0.19	0.47	0.28	0.46	0.35	0.5	0.15	0.43
HH size	3.38	2.19	3.25	2.30	5.23	2.17	2.96	1.90	2.56	2.10	4.79	1.81
Illiterate	0.72	0.45	0.32	0.47	0.3	0.46	0.68	0.47	0.3	0.46	0.3	0.46
Read &Write	0.11	0.31	0.18	0.38	0.24	0.43	0.11	0.31	0.15	0.36	0.2	0.4
Prim.-Low Sec.	0.04	0.21	0.09	0.29	0.08	0.28	0.05	0.22	0.08	0.27	0.09	0.29
Secondary	0.08	0.27	0.21	0.41	0.19	0.39	0.1	0.3	0.22	0.41	0.23	0.42
Post-Secondary	0.02	0.13	0.04	0.2	0.04	0.2	0.01	0.11	0.05	0.22	0.04	0.19
Univ. & above	0.04	0.19	0.15	0.36	0.15	0.35	0.05	0.22	0.19	0.39	0.14	0.35
Employed	0.22	0.41	0.68	0.47	0.89	0.31	0.22	0.42	0.69	0.46	0.9	0.3
Unemployed	0.01	0.07	0.01	0.1	0	0.04	0	0.07	0.01	0.11	0	0.04
Out of L.F.	0.78	0.42	0.31	0.46	0.11	0.31	0.77	0.42	0.3	0.46	0.1	0.3
Blue collar	0.70	0.46	0.51	0.50	0.46	0.50	0.68	0.47	0.50	0.50	0.51	0.50
White collar	0.30	0.46	0.49	0.50	0.54	0.50	0.32	0.47	0.50	0.50	0.49	0.50
Agric & mining	0.67	0.47	0.27	0.45	0.26	0.44	0.64	0.48	0.25	0.43	0.25	0.44
Manufacturing	0.04	0.19	0.13	0.34	0.13	0.34	0.04	0.20	0.12	0.32	0.13	0.34
Services	0.29	0.45	0.60	0.49	0.61	0.49	0.32	0.47	0.63	0.48	0.61	0.49
Metropolitan	0.23	0.42	0.31	0.46	0.2	0.4	0.24	0.43	0.34	0.47	0.2	0.4
Rural Upper	0.25	0.43	0.2	0.4	0.24	0.42	0.26	0.44	0.18	0.38	0.23	0.42
Urban Upper	0.1	0.3	0.13	0.34	0.11	0.32	0.12	0.33	0.15	0.36	0.12	0.32
Rural Lower	0.28	0.45	0.24	0.43	0.31	0.46	0.25	0.43	0.19	0.39	0.32	0.47
Urban Lower	0.14	0.34	0.11	0.31	0.13	0.34	0.12	0.33	0.13	0.33	0.13	0.34
Sample Size	3565		1276		19134		3697		1191		18660	

	2008-2009						2010-2011					
	FHH		MHH		Married Couple		FHH		MHH		Married Couple	
variable	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
Age head	52.78	14.95	52.33	20.14	46.6	13.03	53.31	14.95	52.05	20.57	45.97	13.2
Child<15	0.88	1.33	0.56	1.18	1.63	1.43	0.81	1.24	0.32	0.83	1.52	1.36
Adults>65	0.27	0.45	0.42	0.5	0.19	0.48	0.28	0.46	0.42	0.5	0.18	0.46
HH size	3.38	2.21	3.25	2.58	5.03	2.07	3.22	2.03	2.75	2.06	4.75	1.83
Illiterate	0.65	0.48	0.33	0.47	0.29	0.45	0.65	0.48	0.27	0.44	0.26	0.44
Read &Write	0.1	0.3	0.16	0.37	0.16	0.37	0.08	0.28	0.15	0.36	0.14	0.35
Prim.-Low Sec.	0.07	0.25	0.11	0.31	0.12	0.32	0.07	0.25	0.15	0.36	0.13	0.34
Secondary	0.11	0.32	0.21	0.41	0.24	0.43	0.12	0.32	0.23	0.42	0.28	0.45
Post-Secondary	0.02	0.13	0.03	0.18	0.04	0.2	0.02	0.13	0.03	0.16	0.05	0.22
Univ. & above	0.05	0.22	0.15	0.36	0.14	0.35	0.06	0.25	0.16	0.37	0.14	0.35
Employed	0.21	0.41	0.64	0.48	0.89	0.32	0.19	0.39	0.6	0.49	0.88	0.33
Unemployed	0	0.06	0	0.06	0	0.05	0	0.07	0.03	0.16	0.01	0.08
Out of L.F.	0.79	0.41	0.35	0.48	0.11	0.32	0.81	0.39	0.37	0.48	0.12	0.32
Blue collar	0.70	0.46	0.63	0.48	0.56	0.50	0.68	0.47	0.62	0.49	0.59	0.49
White collar	0.30	0.46	0.37	0.48	0.44	0.50	0.32	0.47	0.38	0.49	0.41	0.49
Agric & mining	0.63	0.48	0.29	0.45	0.25	0.43	0.56	0.50	0.17	0.38	0.21	0.41
Manufacturing	0.04	0.19	0.14	0.34	0.12	0.33	0.05	0.22	0.13	0.33	0.15	0.35
Services	0.33	0.47	0.58	0.49	0.63	0.48	0.39	0.49	0.70	0.46	0.64	0.48
Metropolitan	0.21	0.41	0.31	0.46	0.19	0.39	0.24	0.43	0.42	0.49	0.23	0.42
Rural Upper	0.27	0.45	0.18	0.38	0.23	0.42	0.23	0.42	0.09	0.28	0.2	0.4
Urban Upper	0.11	0.31	0.13	0.34	0.12	0.33	0.12	0.32	0.15	0.36	0.11	0.31
Rural Lower	0.27	0.44	0.23	0.42	0.32	0.47	0.27	0.45	0.21	0.41	0.33	0.47
Urban Lower	0.12	0.33	0.12	0.33	0.13	0.33	0.13	0.33	0.11	0.31	0.12	0.33
Sample Size	**3909**		**879**		**18640**		**1281**		**309**		**6129**	

2012-2013						
	FHH		**MHH**		**Married Couple**	
variable	**MEAN**	**S.D.**	**MEAN**	**S.D.**	**MEAN**	**S.D.**
Age head	54.16	15.14	53.4	19.51	46.84	12.94
Child<15	0.72	1.14	0.24	0.75	1.54	1.34
Adults>65	0.31	0.47	0.41	0.51	0.19	0.49
HH size	2.96	1.85	2.41	1.73	4.75	1.73
Illiterate	0.62	0.49	0.3	0.46	0.26	0.44
Read &Write	0.07	0.26	0.13	0.34	0.13	0.34
Prim.-Low Sec.	0.09	0.29	0.12	0.32	0.13	0.33
Secondary	0.14	0.35	0.23	0.42	0.28	0.45
Post-Secondary	0.02	0.15	0.04	0.19	0.04	0.2
Univ. & above	0.05	0.23	0.17	0.38	0.15	0.36
Employed	0.19	0.4	0.56	0.5	0.88	0.33
Unemployed	0	0.05	0.03	0.16	0.01	0.09
Out of L.F.	0.8	0.4	0.41	0.49	0.11	0.32
Blue collar	0.57	0.50	0.52	0.50	0.55	0.50
White collar	0.43	0.50	0.48	0.50	0.45	0.50
Agric & mining	0.44	0.50	0.15	0.35	0.22	0.41
Manufacturing	0.04	0.19	0.13	0.34	0.13	0.34
Services	0.52	0.50	0.72	0.45	0.65	0.48
Metropolitan	0.2	0.4	0.38	0.49	0.18	0.39
Rural Upper	0.26	0.44	0.15	0.36	0.23	0.42
Urban Upper	0.12	0.33	0.15	0.35	0.12	0.32
Rural Lower	0.28	0.45	0.18	0.38	0.33	0.47
Urban Lower	0.13	0.33	0.13	0.34	0.12	0.33
Sample Size	1337		311		5880	

Source: Author's calculations from HIECS data.

Table 5a Probit Regression Results by Family Type and Year (1999-2008)

	1999-2000			2004-2005			2008-2009		
VARIABLES	Female Headed	Male Headed	Married Couple	Female Headed	Male Headed	Married Couple	Female Headed	Male Headed	Married Couple
Age head	0.000	-0.035*	-0.036***	-0.019	0.001	-0.045***	-0.024*	-0.039**	-0.009
	(0.019)	(0.021)	(0.008)	(0.016)	(0.023)	(0.008)	(0.014)	(0.019)	(0.007)
Age head squared	-0.000	0.000	0.000***	0.000	-0.000	0.000***	0.000	0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Child<15	0.229***	0.088	0.179***	0.172***	-0.081	0.172***	0.181***	0.229***	0.197***
	(0.038)	(0.071)	(0.012)	(0.037)	(0.089)	(0.012)	(0.031)	(0.072)	(0.012)
Adults>65	0.178	0.111	-0.010	0.152	0.065	-0.001	0.031	0.063	0.041
	(0.110)	(0.177)	(0.039)	(0.113)	(0.180)	(0.045)	(0.095)	(0.176)	(0.034)
HH size	0.122***	0.209***	0.123***	0.214***	0.226***	0.210***	0.206***	0.144***	0.140***
	(0.022)	(0.038)	(0.009)	(0.022)	(0.042)	(0.010)	(0.018)	(0.036)	(0.008)
Illiterate	4.514	1.020***	0.937***	1.244***	0.495**	0.834***	1.627***	0.955***	0.920***
	(82.454)	(0.302)	(0.057)	(0.311)	(0.245)	(0.057)	(0.331)	(0.265)	(0.049)
Read &Write	4.098	0.927***	0.660***	0.909***	0.043	0.612***	1.240***	0.688**	0.628***
	(82.454)	(0.308)	(0.057)	(0.325)	(0.294)	(0.057)	(0.343)	(0.284)	(0.052)
Prim.-Low Sec.	3.913	0.443	0.467***	0.765**	-0.023	0.466***	1.187***	0.369	0.481***
	(82.454)	(0.336)	(0.067)	(0.345)	(0.342)	(0.065)	(0.347)	(0.297)	(0.054)
Secondary	3.835	0.480*	0.322***	0.567*	0.225	0.365***	0.967***	0.522**	0.378***
	(82.454)	(0.288)	(0.057)	(0.326)	(0.233)	(0.055)	(0.337)	(0.243)	(0.046)
Post-Secondary		0.644*	0.259***	0.807*	0.202	0.296***	0.760*	0.285	0.143**
		(0.391)	(0.085)	(0.425)	(0.340)	(0.082)	(0.427)	(0.398)	(0.071)
Unemployed	0.369	0.292	0.225	0.572		0.452*	0.594	0.735	0.302
	(0.579)	(0.638)	(0.310)	(0.579)		(0.265)	(0.473)	(0.810)	(0.217)
Out of L.F.	0.158	0.116	0.032	0.352***	-0.607*	0.318***	0.084	-0.474*	0.321***
	(0.119)	(0.277)	(0.067)	(0.121)	(0.311)	(0.065)	(0.105)	(0.244)	(0.057)
Blue collar	0.094	-0.391*	-0.040	-0.033	-0.328	0.001	-0.055	-0.249	0.159***
	(0.095)	(0.205)	(0.036)	(0.087)	(0.215)	(0.034)	(0.076)	(0.194)	(0.031)
Manufacturing	-0.080	-0.264	-0.384***	0.366	-0.443	-0.169***	-0.073	-0.468	-0.106**
	(0.321)	(0.342)	(0.053)	(0.236)	(0.376)	(0.049)	(0.294)	(0.296)	(0.044)
Services	0.260	0.109	-0.085**	0.465***	-0.030	-0.005	0.133	0.270	0.053
	(0.158)	(0.238)	(0.040)	(0.157)	(0.241)	(0.037)	(0.132)	(0.195)	(0.032)
Rural Upper	0.435***	0.357*	0.319***	0.318***	-0.183	0.364***	0.446***	-0.048	0.662***
	(0.106)	(0.188)	(0.040)	(0.100)	(0.196)	(0.039)	(0.085)	(0.174)	(0.034)
Urban Upper	0.123	-0.314	-0.043	-0.017	-0.892***	0.038	0.255**	-0.513**	0.166***
	(0.120)	(0.215)	(0.043)	(0.120)	(0.289)	(0.046)	(0.105)	(0.212)	(0.041)
Rural Lower	-0.056	-0.238	-0.254***	-0.310***	-0.418**	-0.213***	-0.332***	-0.569***	-0.157***
	(0.109)	(0.208)	(0.040)	(0.110)	(0.210)	(0.039)	(0.093)	(0.179)	(0.033)
Urban Lower	-0.404***	-0.618**	-0.541***	-0.263**	-1.012***	-0.447***	-0.579***	-1.267***	-0.422***
	(0.140)	(0.298)	(0.053)	(0.132)	(0.368)	(0.054)	(0.135)	(0.323)	(0.047)
Constant	-6.461	-1.928***	-1.505***	-3.024***	-1.995***	-1.636***	-2.625***	-0.986*	-2.022***
	(82.455)	(0.618)	(0.197)	(0.512)	(0.629)	(0.179)	(0.482)	(0.515)	(0.162)
Observations	3,498	1,276	19,134	3,697	1,176	18,660	3,909	879	18,640
Log Likelihood	-817.6	-228.4	-5862	-939.3	-204.2	-6539	-1238	-283.6	-8048
Chi-Square(20)	586.7	157.2	3509	591.6	94.28	3877	1116	200.2	5177
P-value	0	0	0	0	0	0	0	0	0
Pseudo R^2	0.264	0.256	0.230	0.239	0.188	0.229	0.311	0.261	0.243

Pr (poor |means)	0.0372	0.0298	0.0869	0.0604	0.0289	0.117	0.101	0.0987	0.206
Actual Prop Poor	0.105	0.0662	0.144	0.0944	0.0346	0.154	0.166	0.122	0.245
% Correct Predns	91.22	94.04	87.53	90.13	94.13	85.21	86.11	85.89	80.17

Table 5b Probit Regression Results by Family Type and Year (2010-2012)

	2010-2011			2012-2013		
VARIABLES	Female Headed	Male Headed	Married Couple	Female Headed	Male Headed	Married Couple
Age head	-0.039	-0.136***	-0.014	-0.055**	-0.079	-0.025*
	(0.024)	(0.047)	(0.012)	(0.024)	(0.048)	(0.013)
Age head squared	0.000	0.002***	0.000	0.000*	0.001*	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Child<15	0.269***	0.497***	0.238***	0.113*	0.298	0.226***
	(0.057)	(0.181)	(0.022)	(0.062)	(0.203)	(0.023)
Adults>65	0.142	-1.365**	-0.016	0.025	-0.351	0.012
	(0.162)	(0.620)	(0.061)	(0.154)	(0.519)	(0.063)
HH size	0.181***	0.115	0.189***	0.246***	0.278**	0.171***
	(0.034)	(0.078)	(0.016)	(0.038)	(0.122)	(0.017)
Illiterate	8.111	1.169**	0.898***	1.347***	5.508	0.944***
	(271.945)	(0.562)	(0.088)	(0.454)	(278.428)	(0.090)
Read &Write	8.076	0.577	0.697***	1.025**	4.862	0.646***
	(271.945)	(0.626)	(0.093)	(0.484)	(278.428)	(0.097)
Prim.-Low Sec.	7.946	0.391	0.408***	0.984**	3.650	0.535***
	(271.945)	(0.615)	(0.094)	(0.473)	(278.429)	(0.096)
Secondary	7.593	0.884	0.368***	0.567	5.413	0.488***
	(271.945)	(0.546)	(0.081)	(0.462)	(278.428)	(0.083)
Post-Secondary	6.739		0.088		6.461	0.257*
	(271.945)		(0.124)		(278.428)	(0.132)
Unemployed	3.738	-0.226	0.080			-0.226
	(197.887)	(0.681)	(0.258)			(0.271)
Out of L.F.	0.074	-1.628**	0.330***	-0.150	-0.315	0.324***
	(0.215)	(0.634)	(0.100)	(0.251)	(0.656)	(0.107)
Blue collar	0.025	-0.207	0.127**	-0.339*	-0.024	0.160***
	(0.137)	(0.314)	(0.055)	(0.192)	(0.417)	(0.056)
Manufacturing	-0.040	-1.071	-0.075	-0.169	-0.103	-0.115
	(0.365)	(0.682)	(0.077)	(0.551)	(0.835)	(0.081)
Services	0.109	-0.029	0.035	0.079	0.627	-0.012
	(0.246)	(0.487)	(0.059)	(0.264)	(0.624)	(0.062)
Rural Upper	0.334**	-1.522**	0.514***	0.277*	0.867*	0.372***
	(0.143)	(0.614)	(0.061)	(0.153)	(0.501)	(0.063)
Urban Upper	-0.098	-0.321	0.207***	0.012	-0.354	-0.090
	(0.174)	(0.443)	(0.071)	(0.181)	(0.599)	(0.076)
Rural Lower	-0.686***	-1.023**	-0.179***	-0.492***	-0.328	-0.457***
	(0.161)	(0.418)	(0.057)	(0.166)	(0.568)	(0.063)
Urban Lower	-0.597***	-0.307	-0.432***	-0.632***	-0.269	-0.587***
	(0.209)	(0.372)	(0.080)	(0.242)	(0.677)	(0.087)
Constant	-8.700	1.002	-2.230***	-1.338*	-6.439	-1.799***
	(271.946)	(1.309)	(0.275)	(0.737)	(278.431)	(0.308)
Observations	1,281	301	6,129	1,304	303	5,880
Log Likelihood	-396.1	-68.19	-2524	-393.4	-41.67	-2366

Chi-Square(20)	363.8	58.88	1696	303.0	74.42	1507
P-value	0	0	0	0	0	0
Pseudo R^2	0.315	0.302	0.252	0.278	0.472	0.242
Pr (poor | mean)	0.0448	0.0280	0.185	0.0864	0.00143	0.167
Actual Prop Poor	0.161	0.0698	0.228	0.135	0.0551	0.206
% Correct Predns	86.34	89.04	81.91	87.42	95.71	82.09

Table 6 Poverty Differential between Female headed and Male headed Households

	1999-2000	2004-2005	2008-2009	2010-2011	2012-2013
E1	0.0339	0.0343	0.0510	0.0406	0.0460
D1	-0.0265	-0.0028	-0.0491	-0.0237	0.0390
E2	0.0224	-0.0014	-0.0031	-0.0178	0.0074
D2	-0.0150	0.0329	0.0050	0.0347	0.0775
Total Poverty Differential	0.0074	0.0315	0.0019	0.0169	0.0849

Source: Author's calculations from HIECS data.

Table 7 Poverty Differential between Female headed and Married Couple Households

	1999-2000	2004-2005	2008-2009	2010-2011	2012-2013
E1	0.0231	-0.0423	-0.0375	0.0191	-0.0458
D1	-0.0728	-0.0142	-0.0683	-0.1595	-0.0350
E2	-0.0100	-0.0311	-0.0140	-0.0278	-0.0304
D2	-0.0397	-0.0253	-0.0918	-0.1126	-0.0504
Total Poverty Differential	-0.0497	-0.0565	-0.1058	-0.1404	-0.0808

Source: Author's calculations from HIECS data.