Bargaining Over Risk

The Impact of Bargaining Power on the Riskiness of Household Portfolios

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Abstract

This paper investigates the internal financial decision making process of households, employing comprehensive disaggregated panel data covering the entire Swedish population over seven years. Previous literature has shown that women exhibit higher degrees of risk aversion as compared to men and hold therefore less risky and better diversified portfolios. After replicating this result for single individuals in our data we proceed to show that the distribution of bargaining power among spouses affects the composition of household portfolios: as the married woman's bargaining power increases the riskiness of the household portfolio decreases and the diversification of the portfolio increases. In order to overcome potential endogeneity problems we utilize a source of exogenous variation as an instrument for bargaining power. **JEL classifications:** D10, D14, J16, G02, G11

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1 Introduction

The literature on intra-household dynamics has its roots in the work of Becker (1991), who treated the household as a single decision-making unit with one utility function and pooled income. A limitation of this approach is that it cannot analyze the influence of individual household members with different preferences on household financial decisions making. There is therefore no issue of male-female bargaining power in this case.

Influential empirical evidence has cast doubt on the soundness of the unitary model (Schultz, 1990; Thomas, 1990, 1994; Hoddinott and Haddad, 1995; Lundberg et al., 1997; Browning and Chiappori, 1998) and given way for cooperative bargaining models pioneered by Manser and Brown (1980) and McElroy and Horney (1981) and collective models pioneered by Chiappori (1988, 1992). These studies explicitly take into account that households consist of a number of different members and assume their preferences to be heterogeneous.

Papers that do allow household members to have separate preferences have shown that this is an important consideration. There are not many papers though that look at the financial decision making of households, and most of those who do focus on the consumption-savings choice. Browning (2000) and Mazzocco (2004), for instance, find that the allocation of resources within the household affects the consumption-savings decision when spouses differ in their preferences. Lundberg et al. (2003) provide further empirical support for this by showing that while household consumption falls after the male spouse retires the same does not hold for single households. They interpret this such that wives, expecting to outlive their husbands, use their gain in relative power to enforce their preferences to increase saving rates. The credibility of this explanation is bolstered by their finding that if the husband is more than five years older than the wife (she has therefore more expected years of widowhood), the decline is even greater. Friedberg and Webb (2006), using the Health and Retirement Study (HRS) data set, investigate the consequences of bargaining power on household portfolio choice and find that households tend to invest more heavily in stocks as the husband's bargaining power increases.

Understanding the cause of household financial decisions is important to both researchers who are trying to obtain an understanding of how families

make important decisions and to policy makers who are concerned about the financial stability of households and seek to prevent financial crises caused by household decisions like the one of the last couple of years whose roots can be traced to decisions made by households in the residential mortgage market.

Many of the previous attempts to show how the power distribution within households affects decision making have used differences in spousal characteristics as a measure of relative bargaining power in the relationship (e.g. differences in education, labor income, non-labor income, age difference, assets brought to marriage, current assets, etc). However, the potential endogeneity of these measures prevents giving estimates based on them a causal interpretation.

The central task of empirical studies of this kind is therefore to identify sources of female power that vary exogenously. In particular, one needs an instrument that is strongly correlated with female bargaining power but not directly with the decision making of the household.

In the first part of this paper we establish whether single Swedish men and women differ in their financial decision making. Controlling for demographics such as wealth, age, whether individuals have been married, whether they have children and whether they are homeowners, we find that there is significant difference in the financial behavior of single men and single women. More specifically, single women participate less in risky asset markets, the share of equity and other risky assets in their financial portfolios is lower and the idiosyncratic and total risk in their financial portfolios is lower.

In the second part we investigate how the bargaining between married couples affects their collective financial portfolio. We assume that the household decision-making is a bargaining process, i.e., spouses have unique preferences that can be represented by individual utility functions and that all differences are resolved through a bargaining process.

A spouse's bargaining power is determined by their threat point, the level of utility each spouse could obtain in case of a separation. This threat point can be proxied by the spouses' fall-back income. Fall-back income is defined as the expected salary of an individual given their demographic information and we measure bargaining power as the ratio of female fall-back income to the total fall-back income of the couple. The paper then focuses on how

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changes in the distribution of bargaining powers within households affect the financial decision making of the household.

However, for purposes of identification we need to deal with the potential endogeneity of this measure. We do this by using a source of exogenous variation in the relative bargaining power of spouses as an instrument for our bargaining power measure. The instrument we use is a measure of prevailing female (male) wages, reflecting only the exogenous gender-specific demand for labor (see, for instance, Bartik, 1991; Blanchard and Katz, 1992; Aizer, 2010). Furthermore, this measure does not reflect underlying worker characteristics at the county-level which could be correlated with riskiness of household portfolios.

We use comprehensive disaggregated Swedish data covering the entire population of Sweden for the period 2000-2006. The outcome variables we investigate are market participation (the propensity to participate in equity markets and other risky asset markets), asset allocation (the propensity to allocate a higher share of their financial wealth[1] in equity and other risky assets), risk taking and diversification (the propensity to take systematic and idiosyncratic risk). The large sample size of our data sets us apart from others; we have several million observations (between 2.7 and 6.2 million observations, depending on the outcome variable), allowing us to obtain very precise estimates of the effect of bargaining power on the outcome variables of interest to us.

We first show that the data reveals the same characteristics that are generally accepted in the literature. When comparing single men and single women, conditional on background characteristics, we find that single men hold on average more risky portfolios, have higher participation rates in equity markets and risky asset markets, are less diversified and take more idiosyncratic and total risk. We also show that couples are much more likely to participate in equity markets and other risky asset markets, which is in line with previous literature.

We then proceed to our main research question on how the distribution of bargaining power between spouses affects household portfolios. Our results imply that female bargaining power has a sizeable and significant effect on the composition of household portfolios. More specifically, our results show

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[1]Financial wealth is the value of the household financial portfolio, defined as equity, bonds, funds and bank accounts.

that bargaining power plays a significant role in household financial decision making and that the traditional assumption of the unitary household is not supported by the data: enhancement of the bargaining power of married women reduces households' propensity to participate in risky asset markets; it reduces the risky share of those households that do participate; and it reduces the total risk of the risky part of household portfolios, while most of this reduction is brought about via a reduction in the amount of idiosyncratic risk.

The rest of the paper is organized as follows. In Section 2 we provide some background on the riskiness of household portfolios. In section 3 we discuss how spousal bargaining can affect financial decision making of households. Section 4 describes the data set and the theoretical background. In section 5 we explain our identification approach. In section 6, we report our main results while section 7 presents concluding remarks.

2   Background on the riskiness of household portfolios

Risk preferences play an important role in models of financial decisions and in theories of financial portfolio choice. These models trace out an explicit relation between the risky share of portfolios, the fraction of financial wealth invested in risky assets, and risk preferences.

According to the classical Merton (1969) model of consumption and portfolio choice, the optimal fraction of individual's portfolio invested in risky assets, the risky share, for individual i is

$$\theta_i = \frac{\tau_i r_i^e}{\sigma_i} \tag{1}$$

where r_i^e is the expected risk premium, τ_i the risk tolerance coefficient and σ_i is the return volatility of risky assets.

In the aggregate, households have to hold the market portfolio and this is the main rationale of a prevalent assumption in the literature that beliefs concerning risky assets are the same for all individuals, i.e., $r_i^e = r^e$ and $\sigma_i^2 = \sigma^2$. Given this assumption, the model infers that all heterogeneity in portfolio composition should be accounted for by differences in risk

aversion.[2]

Among the basic principles of financial theory is that household portfolios should be diversified, i.e., households should not concentrate risk in one or few (possibly correlated) assets since a greater degree of diversification can lower the portfolio's risk for a given return expectation (Markowitz (1952)).

The previous literature shows that households do not follow this precept in general though.[3] The previous literature shows that households hold a limited number of stocks directly.[4] Swedish households are no exception in this case as Calvet et al. (2007a) show, using the same dataset as we do.

Previous studies also show that there is a sizable heterogeneity in how well diversified household portfolios are. Calvet et al. (2007a) study what drives this heterogeneity among Swedish household. They find that the households with high idiosyncratic risk have their portfolios concentrated in individual stocks, whereas households with low idiosyncratic risk have their portfolios concentrated in mutual funds. Swedish households therefore strive to smooth out unsystematic risk in their portfolios through holdings of mutual funds and not by increasing the number of individual stock ownerships.

The heterogeneity in household investment choices can partly be accounted for by differences in demographics. Calvet et al. (2007a) find that poorer, less educated, retired and unemployed households are less diversified.[5] However, the empirical literature on household financial risk taking is largely silent on what happens within households when taking decisions on the composition of their portfolios. In order to understand these processes it is necessary to look at the bargaining within households. It is possible that the considerable amount of diversification heterogeneity across households that cannot be accounted for by demographics can be explained by risk preference heterogeneity within households and bargaining between spouses.

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[2]Note though that as risk preferences are typically unobserved, a direct test of the model is not feasible without an independent measure of individuals risk attitudes.

[3]Blume and Friend (1975, 1978) and Goetzmann and Kumar (2008), for instance, show that households hold a limited number of stocks directly.

[4]See for instance Blume and Friend (1975, 1978) and Goetzmann and Kumar (2008).

[5]They also show that those households reduce the losses caused by the larger idiosyncratic risk they have in their portfolio by taking less risk. This is consistent with an interpretation in which households are aware of their investment aptitudes when they decide on how much risk to take.

We compare the actual diversification of Swedish households to a diversified equity benchmark. Since Sweden is a small and open economy, we opt for a comparison to a diversified portfolio of global stocks. For this purpose, we follow Calvet et al. (2007a,b) and go for the All Country World Index (henceforth "global index") compiled by Morgan Stanley Capital International (MSCI) in U.S. dollars. Given a global index G, CAPM asserts that the relationship between the excess return of asset i and the excess return of the market global index is given by

$$r_{i,t} = \beta_i r_{G,t} + \epsilon_{i,t}, \tag{2}$$

and it follows that the relationship between the expected excess asset returns and the expected excess global index returns is given by

$$r_{i,t}^e = \beta_i r_{G,t}^e, \tag{3}$$

where $r_{i,t}^e$ and $r_{G,t}^e$ denote the expected excess return on the risky asset and on the global portfolio, respectively. β_i is the sensitivity of the expected excess asset returns to the expected excess global index returns. The residuals from (2) then give use the covariance matrix for the residuals of each asset and they are obtained in the following way:

$$\epsilon_{i,t} = r_{i,t} - \hat{\beta}_i r_{G,t} \tag{4}$$

This therefore measures the idiosyncratic risk of asset i and if we now consider a portfolio of n risky assets then the covariance matrix for the idiosyncratic risks is given by

$$\Sigma = \begin{pmatrix} \sigma_1^2 & \sigma_{1,2} & \cdots & \sigma_{1,n} \\ \sigma_{2,1} & \sigma_2^2 & \cdots & \sigma_{2,n} \\ \vdots & \vdots & \ddots & \vdots \\ \sigma_{n,1} & \sigma_{n,2} & \cdots & \sigma_n^2 \end{pmatrix}$$

Now let w_i denote the fraction of wealth invested in asset i and the weight vector of the portfolio be

$$w = \begin{pmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{pmatrix}$$

Idiosyncratic risk of the risky portfolio of household h is thus given by:

$$\sigma_{i,h}^2 = w'\Sigma w, \tag{5}$$

and systematic risk of the risky portfolio of household h is given by:

$$\sigma_{s,h}^2 = \beta_p^2 \sigma_G^2 \tag{6}$$

where $\beta_p = w'\beta$

The total risk of the household portfolio, σ_h^2 is therefore comprised of systematic risk, $\sigma_{s,h}^2$, and idiosyncratic risk, $\sigma_{i,h}^2$. These measures capture the volatility of the risky part of household portfolios and the volatility of the risky part of household portfolios that is due to idiosyncratic risk, respectively.

3   Spousal Bargaining and Financial Investments

Economic models of portfolio investments typically examine the optimal behavior of a single individual who faces alternative amounts of risk in his financial portfolio under different portfolio compositions. However, these models fail to account for the fact that most adults are a part of a couple and their decisions are the outcome of a joint decision-making process that reflects the preferences of both spouses.

A mounting number of game-theoretic models of household decision making have been developed in recent years and have been supported by data. Financial decision making within the household, however, has not been analyzed a lot within this framework. The general implications of bargaining models is that multiple factors that are usually not considered important when modeling financial investments determine the distribution of bargaining power within households, and thereby their decisions.

As pointed out earlier, Becker's approach to the family's allocation does not take into account the possibility of conflicting preferences of spouses. Accordingly, divergent preferences of spouses concerning financial investments cannot be analyzed within the unitary framework. Collective and cooperative bargaining alternatives to the unitary model explicitly take into account that the husband and the wife have separate utility functions and allow the couple to "bargain" over the investment path taken by the household.

We assume that a couple is comprised of a husband (1) and a wife (2) and that spouse i's payoff in marriage, U_i, depends on three factors. First, individuals get utility from their private consumption. Second, there are some private gains from marriage, v_i. Third, there are other benefits from marriage that depend both on the real portfolio composition of the household, π, and the desired portfolio composition, π_i^*, $V_i(\pi, \pi_i^*)$. Both spouses are therefore assumed to care about the composition of the financial portfolio of the household. Note that Interdependence in the marriage operates solely through the consumption of a public good, the financial portfolio of the household. There is no altruism, i.e., the utility of spouses does not depend directly upon their partner's utility.

Both the general collective approach and cooperative bargaining models impose a Pareto-optimal joint solution in which the couple maximizes a weighted sum of their individual utilities:

$$\rho(T_1, T_2)U_1(v_1, V_2(\pi, \pi_1^*)) + (1 - \rho(T_1, T_2))U_2(v_2, V_2(\pi, \pi_2^*))$$

where the "sharing rule", $\rho(T_1, T_2)$, depends upon factors that influence the relative bargaining power of the husband and the wife. The spouses' bargaining power is determined by their threat points, T_i, the level of utility each spouse could obtain in case of a separation. Hence, the bargaining power is affected by any factor that affects their threat points.

We hypothesize that the riskiness of the household portfolio will decrease in households that experience a shift in bargaining power from the husband to the wife. We do not impose any particular bargaining structure, but use a simple reduced form collective model that will allow us to test whether variation in our measure of relative bargaining power affects the composition of household portfolios.

Furthermore, we also hypothesize that a shift in bargaining power be-

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tween spouses has different implications for the riskiness of household port-
folios for different parts of the threat point distribution of wives. Due to
individual characteristics we expect that the distribution of the effects is not
constant on the threat point distribution of wives. Theory of household bar-
gaining suggests that there is a level of the outside option at which a woman
would be indifferent between filing for divorce and following her husband's
will when it comes to household financial decision making, and the impact
of an exogenous variation in bargaining power should be larger around this
margin.

The intuition behind this is straightforward: women with very poor al-
ternatives outside marriage cannot take advantage of their bargaining power
(their bargaining power is too low for their threats to be taken credible),
while threats made by women with very good outside option are always taken
seriously, independent of the relative bargaining power. We would therefore
expect that an exogenous increase in female bargaining power would have
larger impacts on households on the center-bottom part of the fall-back in-
come distribution. This is illustrated in figure 1. Thus, we believe that a
shift in bargaining power from the husband to the wife causes a larger re-
duction in risk in household portfolios in households where wives are in the
lower part of the threat point distribution.

4 Data and institutional background

Our data set contains highly disaggregated data on the entire Swedish pop-
ulation for the period 2000-2006. Statistics Sweden, a government agency,
has a mandate to collect extensive data on all individuals that either live
in Sweden, are Swedish citizens, or own assets in Sweden. By virtue of the
fact that the data is collected by one central agency together with the fact
that this data is used for tax purposes, we believe that our data set is of
unusually high quality.

The data set consists of four distinct parts which are used together
throughout the paper. The first of these parts is the demographic data.
This data set contains information about age, education, location of resi-
dence, family ties, and also other information such as salary income and real
estate wealth. The second part is the data on security holdings detailing the
financial portfolios held by individuals. The third part is a data set listing

all security sales and the price at which each individual security was sold at. Finally, we complement our data set with data from third party vendors such as Datastream and Morningstar.

The securities in both the portfolio data and the transaction data are identified by their respective International Security Identification Number (ISIN). By merging these data sets with third party data we are able to accurately price the assets and determine which category the assets fall within (bonds, derivatives, stocks, funds etc.). In addition, it also enables us to obtain historical return series for the securities, which we use to calculate measures of volatility.

Our proxy of spouse's threat points obtained by matching spouses with single individuals on 5 individual characteristics. More specifically, it is constructed as the average annualincome for singles, defined as non-married and non-cohabiting people with children, conditional on their age, gender, whether they have children, location of residence, as well as the field and level of their most qualified education.

This definition implies five restrictions on the data that are important to note. First, since fall-back income is undefined for individuals too young to enter the labor force or individuals that have retired, we are considering only individuals between the ages 16 and 65. Second, a small number of married individuals have very unusual profiles, such that there are no single individuals with matching profiles on which the conditional average income can be calculated; these individuals are also dropped. Third, information about education is missing for some individuals; these individuals are dropped. Fourth, we are only considering individuals that are living in Sweden; Swedish citizens living abroad and foreign citizens with assets holdings in Sweden are dropped from our sample. Finally, since we are interested only in married couples for which both spouses have defined fall-back incomes, we drop the spouses of individuals that are excluded due to any of the data restrictions listed above.

Throughout the paper we will consider couples to be a man and a woman who are married and singles to be those who are living alone or are living with someone but without a common child. Ideally we would not want to define those living together but without a common child as singles but it is impossible to distinguish them from truly single people in the data. We can identify cohabiting people in the data if they have a common child but

since we are not able to identify all cohabiting individuals we only consider couples to be those who are married. To be clear, henceforth, whenever we refer to couples or spouses we mean married people.

There is one limitation of the data that requires some discussion. Between the years 2000 and 2005 banks were required to report their customers' bank account balances only if these accounts had accrued interest payments in excess of 100 SEK. Unfortunately, this means that we miss bank account information for roughly half of our sample. In 2006 this reporting requirement was changed such that all accounts with balances exceeding 10 000 SEK had to be reported. This increased our bank account coverage somewhat, but we still miss bank account balances for a large part of the sample.

Missing bank account data can distort our estimates of the household share of financial wealth held in risky assets but do not affect our estimates of diversification of the risky part of portfolios. This situation forces us to impute the balances on the accounts we are missing. The Swedish central bank has information about the total sum of all money deposited in bank accounts. By subtracting the deposits that are accounted for in our data from the total sum of all deposits we arrive at a residual which we allocate equally over all the individuals with missing bank accounts. This method is in line with the method used by Calvet et al. (2007a,b)[6].

In tables 1 and 2 we report aggregate wealth statistics of Swedish households and its breakdown into main asset categories by the end of each year under consideration. The tables also include the official wealth statistics published by Statistics Sweden (SCB). A few notes are worth making. Our values match the official values quite well. Discrepancies can be explained by slight differences in classifications of funds. The numbers show that our data set has good aggregation properties, confirming that it's both reliable and accurate. Table 3 provides summary statistics for financial assets as well as other household characteristics for married individuals, single males and single females.

For each household, we consider two different measures of amount of risk in household portfolios: the direct equity share, defined as the value of stocks divided by total financial wealth; and the risky share, which defines stocks,

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[6]Calvet et al. (2007a,b) employed three different imputation methods to address this problem, one of which was the constant balance method, and found that their results were not sensitive to which method they used. Therefore we only consider the method we find most apppealing and do not repeat our calculations using their other methods.

equity funds, hedge funds and mixed funds as risky assets and is calculated as the value of risky assets divided by total financial wealth. Direct equity (risky) participation is equal to one for those whose direct equity (risky) share is positive and zero otherwise. We are also interested in risk taking and diversification of household portfolios and therefore we consider also the volatility of the risky part of household portfolios and the volatility of the equity portfolio of households.

Table 4 provides information on intra-household income distribution for Swedish households. The first column shows that in around 67 percent of marriages, the man has a higher real income than the woman and in about 31 percent of the cases the man earns more than 70 percent of the total household income while women earn more than 70 percent of the household income in approximately 14 percent of the cases. When we consider fall-back income we see that the proportion of marriages where men have higher fall-back income than women is similar as for real income. In about 12 percent of the cases they have more than 70 percent of the total household fall-back income while women have more than 70 percent of the household fall-back income in less than 5 percent of the cases.

Table 5 provides information on intra-household age and education distribution for Swedish households. This reveals that in around 18 percent of marriages, the man is more than five years older than the woman and that in about 2 percent of the cases the woman is more than 5 years older than the man. When we consider education it can be seen that the proportion of relationships where men have higher education than women is around 21 percent and that in about 32 percent of the cases the woman has higher education.

According to Swedish marriage law, a spouse always has the right to obtain a decree for a divorce and is not required to base such a decree on any special grounds. Following a divorce, a couples assets are to be divided between them. The couple is encouraged to divide their assets privately but if they are in disagreement they can apply to the district court for the appointment of a marital property administrator, who will then make a decision regarding what should be included in the division, how their assets should be valued and how they should be divided. The general principle is equal sharing and to ignore who earned the most or brought most into the

relationship.[7] Which spouse is at fault for the dissolution of the marriage is also irrelevant as regards the division of their assets. When the divorce is final, the spouses are responsible for their own provision.

5   Identification Approach

Our identification approach takes advantage of the segregated nature of the labor market for women versus men in the Swedish labor market. More specifically, we exploit the fact that there is a lot of heterogeneity in sex specific labor demand across municipalities. In this section, we start by explaining how bargaining power has been measured in the literature and the corresponding problems. Next, we explain how we circumvent these problems and how we are able to capture the causal effect of bargaining power on household outcomes. Finally, we discuss our empirical approach in more detail and the outcome variables under consideration.

5.1   Measures of Bargaining Power

Several measures of bargaining power have been used in the literature. However, endogeneity is a potential problem associated with most of them. In most cases, they are based on the theory that the degree to which spouses are able to exert their preferences in household decision making is determined by the respective resources the spouses contribute to the household (Blood and Wolfe, 1960)[8].

Non-labor income is one of the measures of bargaining power that has been used in the literature and has been used to study its effect on various household outcomes (e.g. Thomas, 1990; Schultz, 1990). However, non-labor income suffers from potential endogeneity since it is a characteristic of past savings behavior or receipt of inheritance, pension, benefits etc. that are also influenced by spouses' power, causing a potential endogeneity problem.

Many papers use relative earnings or relative income of the wife as a measure of bargaining power (e.g. Browning et al., 1994; Euwals et al., 2004;

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[7]However, if the result is unreasonably unfair, due for example a short relationship, the court has the ability to modify the division to ensure fairness

[8]Doss (1996) proposes an alternative view: a wife's lack of a wage income may simply reflect her good bargaining position within the household, i.e., she may exert her bargaining power to choose not to work in the labor market and to let other household members support her.

Gibson et al., 2006; Lundberg and Ward-Batts, 2000). However, treating earnings or income as an indicator of bargaining power typically involves the erroneous assumption that earnings at the observed cooperative equilibrium is a good proxy for earnings at the unobserved threat point. Furthermore, income depends upon labor force participation and time allocation decisions which are also influenced by spouses' relative power.

A number of other endogenous measures of bargaining power that might be subject to endogeneity have been employed to study its effect on household decisions making. In order to give estimates based on these measures a causal interpretation, their potential endogeneity must be dealt with.

A spouse's bargaining power is determined by her or his utility at the threat point. A relative increase in non-labor income in divorce threat models would, for instance, be expected to increase well-being at the threat point and, hence, also relative bargaining power and exogenous shifts in a spouse's utility at the threat point can be used to capture the causal effect of bargaining power.

Lundberg et al. (1997) find, for instance, that an exogenous change in public transfers to the wife causes a substantial and significant increase in expenditure on children's clothing relative to men's clothing, and on women's clothing relative to men's clothing through increased bargaining power of women.

Direct control of monetary resources is not the only factor that can contribute to a relative increase in intra-household bargaining power. Preferable characteristics such as higher education can also increase well-being at the threat point and their power at home. For instance, Strauss and Thomas (1991) find that the education of Brazilian mothers can increase children's height via their mother's access to information, measured by indicators of newspaper reading, TV watching and radio listening.

There are also other channels through which the female bargaining power within the household can be increased, regulatory changes can, for instance, be used as a proxy for an exogenous shift in family bargaining power. Rangel (2006) uses a regulatory change in alimony rights in Brazil as a proxy for an exogenous increase in relative bargaining power of women and finds that this affects the level of investment in schooling of children. However, any measure of couples' relative power that does not involve an exogenous shift in their utility at the threat point must be instrumented properly.

As discussed by Pollak (2005, 2011), fall-back income, not actual income, determines well-being at the threat point and, hence, bargaining power as well. Consider for example a highly educated married woman where the household tasks are divided such that she stays at home with the children and takes care of the household. Her earnings are affected by the very fact that she is married; she earns nothing even though she would have high income should they split up and she start working. A spouse whose earnings are low because he or she chooses to allocate working hours to household production instead of market work, does not have less bargaining power. However, a spouse whose fall-back income is low does have less bargaining power.

We use therefore the ratio of salaries the married individuals could expect to earn should they divorce their spouse as our proxy of the spouse's relative utility at the threat point, and hence also their bargaining power. In order to estimate this salary we calculate the average salary of people of the same gender and age with the same education living in the same region that either do or do not have children.

Our bargaining power measure is prone to endogeneity as it is based on many choice variables that are therefore very likely correlated with unobservables relegated to the error term. OLS estimates based on this measure could thus be biased and we therefore need an exogenous source of variation to instrument it. If fall-back income ratio is endogenous with respect to the outcome under consideration, the instrumental variable estimates are consistent, while the ordinary least squares estimates are not.

5.2 IV measures

In order to deal with the potential endogeneity of the fall-back income measure and establish a causal relationship between power and the composition of household portfolios, we need a source of exogenous variation as an instrument for our measure of bargaining power.

To identify exogenous variation in the gender wage gap, we follow Aizer (2010) in constructing a measure of county level labor demand shifts. This measure is based on and uses the same identifying source of variation as an index of labor demand introduced by Bartik (1991) that has subsequently been used by Blanchard and Katz (1992), Bound and Holzer (2000), Hoynes (2000) and Autor and Duggan (2003).

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This approach exploits the fact that certain industries have traditionally been dominated by women (e.g., services) and others by men (e.g., construction). For instance, data for Sweden show that in 2006, 77.2% of employers in health care, social services and veterinary services were women and that 92.0% of construction employees were men. We exploit this segregated nature of the labor market for women versus men within the Swedish labor market where increases in demand in some sectors result in exogenous increases in the female/male wage ratio. Using the industrial structure of the county under consideration and the countrywide wage growth within industries we can create gender-specific measures of prevailing local wages.

The instrument we use is a measure of prevailing female (male) wages that reflects solely the exogenous demand for female (male) labor. This approach accounts for the fact that fall-back income, not actual income, determine well-being at the threat point and solves the problem of potential endogeneity of the fall-back income. The instrument is based on a measure of average annual wages that are calculated by gender in each county as follows:

$$\bar{w}_{gcey} = \sum_j \alpha_{gcej} w_{-cyj} \tag{7}$$

where α_{gcej} is the proportion of workers of gender g in county c with education e that are working in industry j[9] and w_{-cyj} is the annual wage of workers in industry j in Sweden except for county c in year y. The proportion α_{gcej} is fixed over the entire period so that selective sorting across industries is not reflected in this wage measure. Our data contains 88 different industries, 21 different areas and 3 different education levels.

The reason for excluding the county under consideration when measuring wages over counties is to prevent endogeneity associated with local labor force characteristics, i.e., by doing this we remove from the measure any changes in wages that could be caused by changes in local labor force characteristics. This addresses the concern that the observed change in countrywide wage growth is driven by the concentration of an industry in the county under consideration.

By constructing our measure like this we know that counties with higher

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[9]$\alpha_{gcej} = N_{gcej} / \sum\limits_{g} N_{gce}$ and therefore $\sum\limits_{j} \alpha_{gcej} = 1$

concentration of female dominant industries that are experiencing a high countrywide wage growth will experience a greater narrowing in the gender wage gap and our identification is based on this. Let us assume that there are only two counties, Stockholm and Gotland, and three industries, manufacturing, service and farming. Furthermore, the shares of each industry in Stockholm and Gotland are 0.2, 0.7, 0.1 and 0.3, 0.2 and 0.5, respectively. Now, if there is a higher countrywide wage growth in services than in the other industries, Stockholm will experience a shrink in the gender wage gap while Gotland does not, causing an upward shift in the relative bargaining power of women in Stockholm

This measure of female/male wage ratio increased by 0.6 percentage points, from 0.893 to 0.898, between 2000 and 2006. At the same time, the true wage ratio increased by 7.0 percentage points, from 0.829 to 0.887. These numbers can be found in table 6. Furthermore, figure 2 shows the actual and fall-back wage ratio for each county on maps of Sweden. This both illustrates the variation between counties and the divergence between actual and fall-back wages.

5.3 Empirical Approach

The outcome variables of interest to us are the following:

Market participation:

$$
\mathbb{I}_{\phi_h > 0} = \begin{cases} 0 & \text{if} \quad \phi_h = 0 \\ \\ 1 & \text{if} \quad \phi_h > 0 \end{cases}
$$

$$
\mathbb{I}_{\theta_h > 0} = \begin{cases} 0 & \text{if} \quad \theta_h = 0 \\ \\ 1 & \text{if} \quad \theta_h > 0 \end{cases}
$$

where ϕ_h is the direct equity share for household h and θ_h is the risky share for household h

Asset allocation:
Direct equity share:

$$\phi_h = \frac{\sum_{j \in E} Q_{h,j} P_j}{\sum_{j \in A} Q_{h,j} P_j}$$

Risky share:

$$\theta_h = \frac{\sum_{j \in E \cup F} Q_{h,j} P_j}{\sum_{j \in A} Q_{h,j} P_j}$$

where E stands for equity, F for risky funds, A for all financial assets, $Q_{h,j}$ is the number of shares of asset j owned by household h and P_j is the price of asset j.

Risk taking and diversification:

Total risk: TR_h is the total risk of household h and is defined as the volatility of the risky part of the portfolio, measured as the annualized standard deviation of the return of the risky part of the portfolio. This measure captures the volatility of the risky part of the household portfolio.

Idiosyncratic risk: IR_h is the idiosyncratic risk of household h and is defined as the volatility of the part of the portfolio that is subject to idiosyncratic risk, measured as the annualized standard deviation of the return of the part of the portfolio that is subject to idiosyncratic risk. This measure captures the volatility of the risky part of the household portfolio that is due to idiosyncratic risk.

We consider the following regression:

$$Y_h = \alpha_0 + \alpha_1 \frac{z_{h2}}{z_{h1} + z_{h2}} + \epsilon_h \tag{8}$$

where Y_h is the outcome variable under consideration of household h, z_{h1} and z_{h2} are fall-back incomes for the husband and the wife in household h, respectively, and ϵ_h is an unobserved component which captures everything else influencing the outcome variable under consideration.

We then add additional controls, X_h, in order to pick up background factors:

$$Y_h = \alpha_0 + \alpha_1 \frac{z_{h2}}{z_{h1} + z_{h2}} + \beta X_h + \epsilon_h \tag{9}$$

If female bargaining power was randomly assigned across relationships, we could give the OLS estimates in the above specification causal interpreta-

tion. However, female bargaining power is unlikely to be randomly assigned and it is possible that we are subject to selection on observables or unobservables. The coefficient on fall-back income, α_1, will therefore not necessarily represent the causal effect of women's power on financial portfolio outcome variables.

In order to overcome this endogeneity problem we need to isolate a source of variation in female bargaining power that is exogenous to household portfolio outcomes. We take advantage of the fact that certain industries have traditionally been dominated by women and others by men and create gender-specific measures of prevailing local wages based on the industrial structure of the county and countrywide wage growth in industries dominant in each county. This measure reflects gender-specific labor demand (see Bartik, 1991; Blanchard and Katz, 1992) without being affected by underlying worker characteristics in the county which could be correlated with riskiness of household portfolios. Our hypothesis is that households living in areas that experience increase in women labor demand will also experience an increase in women's power within their relationships.

The first stage regression equation can be written in the following way:

$$\omega_h = \frac{z_{h2}}{z_{h1} + z_{h2}} = \delta_0 + \delta_1 Ratio_h + \beta X_h + u_h \tag{10}$$

where $Ratio$ is the ratio of local wages of females and the local wages of male and females, i.e.,

$$Ratio_h = \frac{s_{h2}}{s_{h1} + s_{h2}} \tag{11}$$

where s_{h1} and s_{h2} are local incomes[10] for the husband and the wife in household h, respectively, and u_h is an unobserved component which captures everything else influencing the fall-back income ratio. The predicted value of the fall-back income from the first stage, $\hat{\omega}_h$, is then used in the second stage regression:

$$Y_h = \alpha_0 + \alpha_1 \hat{\omega}_h + \beta X_h + \epsilon_h \tag{12}$$

In order to be a good instrument, the $Ratio$ variable can only affect

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[10]Local income is our gender specific measure of local wages that was defined in equation(7).

household portfolio decision making via the endogenous fall-back income, and not through any other channels.

6 Results

6.1 Descriptive results

We first want to show that our data reveals the same characteristics for single individuals and couples as are generally accepted in the literature. Figure 3 provides graphical illustrations of how single men and single women differ from each other and from couples in their financial decision making. We control for wealth and debts of agents, their age[11], whether they have ever been married, whether they have children[12], whether they are homeowners and their level of education[13].

The difference in market participation of single men and single women depends on which definition of market participation we consider. When we consider direct equity participation we find that single males participate, consistently, more than single females but when we also consider participation in other risky asset markets there does not seem to be any consistent difference between the participation of single men and single women in risky asset markets. Furthermore, the figure also reveals that the participation among couples is higher than among singles. This is consistent with the finding of Christiansen et al. (2012) who find that becoming a two-headed household makes investors participate more in the stock market. When we also consider participation in other risky asset markets we find that our comparison of singles and couples is consistent with the case of direct equity participation: participation is risky asset markets among couples is higher than among singles.

When we compare the asset allocation decisions of single males and single

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[11]When controlling for the age of a couple, we use their average age.

[12]We control for the number of children under the age of 3, the number of children between 4 and 10 and the number of children between 10 and 17.

[13]We do this by running regressions for the outcome variables of interest to us with wealth, debt, age, a dummy for whether the person has ever been married, the numbers of children in each age category, a dummy for whether the person is a homeowner, dummies for different level of education as controls and dummies for whether the person is a part of a couple, a single man or a single woman. We use the estimates obtained from these regression to obtain predicted values for each group under consideration where the values for the controls are the sample-wide averages of households for the controls.

females by looking at the direct equity share and risky asset share for these groups our results are more consistent with each other than when we looked at the participation decision of single individuals. Conditional on participation, single males invest, consistently, a higher fraction of their financial wealth in equity than single females. Also, among singles who do participate in risky asset markets, males invest, consistently, a higher fraction of their financial wealth in risky assets. However, when using this measure of the risk content of household portfolios, the difference between single males and single females is much less than when comparing their direct equity shares. This implies that single males are more likely to invest in individual stocks than single females, suggesting that single males might have higher propensity to take idiosyncratic risk. The graph also reveals that couples have a lower direct equity share and a lower risky share than singles.

Conditional on participation, total risk of single males, measured as the volatility of risky part of their portfolio, is higher than that of single females. As with total risk, single males have higher idiosyncratic risk than single women. Couples' total risk lies between the total risk of single males and single females and the idiosyncratic risk of couples falls between the idiosyncratic risk of single males and single females. This fits with the results of Christiansen et al. (2012) who find that marriage acts as a financial "risk-reducer" for men and a financial "risk-increaser" for women when they analyze the effect of marriage on the share of wealth individuals hold as equity. The graph therefore suggest that single women take less risk and are more diversified than single men and that the decision on financial risk taking and diversification of couples is a convex combination of the decisions that a single men and women would take.

Idiosyncratic risk: The graphs are consistent with the idea that there is something that separates men, women and married people from each other when it comes to financial decision making and that is not readily explainable by observables. More specifically, the graphs illustrate that when comparing single men and single women, conditional on background characteristics, single men hold on average more risky portfolios, have higher participation rates in equity markets and are less diversified and take more idiosyncratic and total risk. We also show that couples are much more likely to participate in equity markets and other risky asset markets. All these results are therefore in line with previous literature. Furthermore, the graphs

for total risk and idiosyncratic risk are consistent with the idea that when a man and a woman get married they each use their bargaining power to enforce their preferences and that they eventually come to terms with an arrangement that falls between the arrangements each of them would have had outside the marriage and their relative bargaining power determines which scenario their collective arrangement is closer to. This is all consistent with what one would expect. However, it can also be seen from the graphs for the risky participation, direct equity share and risky share that not all financial decisions of households are a convex combination of the decisions husbands and wives would take in case they were single, even after controlling for everything conceivable. One potential explanation for this is that family composition can be viewed as a source of a background risk and therefore plays a role in determining the demand for risky assets and participation in risky asset markets[14]. Furthermore, although some of the figures present strong evidence of a setup where household decisions are taken such that decisions of couples are based on a convex combination of the preferences of the each spouse, they do not say anything about what determines how their preferences are weighed even though one could expect the relative bargaining power of the spouses to be the force behind how their utilities are weighted. These graphs can therefore only be taken as a descriptive of household behavior and if we wish to pursue the question of whether financial decision making of households is determined by the relative bargaining power of spouses we must turn to regression analysis.

6.2   Regression results

Tables 7 and 8 provide a comparison of single men and single women, using OLS estimations, and IV estimates of the effect of bargaining power on the financial decisions of interest to us. The following subsections provide a discussion of our results for market participation, asset allocation and risk taking and diversification.

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[14]Several papers show, both theoretically and empirically, how the existence of background risk can affect the riskiness of household portfolios. See, for instance, Guiso, Jappelli, and Terlizzese (1996); Koo (1998); Heaton and Lucas (2000); Kimball and Elmendorf (2000); Viceira (2001); and Haliassos and Michaelides (2003).

6.2.1 Comparison of single males and females

The conclusions drawn from the comparison of market participation of single males and single females are different depending on which measure of market participation we use. When we look at direct equity participation we find that single males participate more in equity markets than single women. More specifically, single women are 6.4 percentage points less likely to participate in equity markets, all else the same. This means that direct equity participation is 27.9% lower for single women than for single men. However, single females participate more in risky asset markets than single males. Risky asset market participation is 1.4 percentage points higher among single females than among single males, implying that risky asset market participation is 3.1% higher for single women than for single men.

As in the case of the descriptive results, the comparison of the direct equity share and the risky market share for single males and females are more consistent with each other than the participation comparison. For those singles who participate in equity markets, single males have a higher equity share than single women, meaning that they place a higher proportion of their financial wealth in equity. More specifically, the direct equity share for single women is 5.0 percentage points lower than for single males, all else equal. This means that the direct equity share is 16.5% lower than for single men. Looking at the risky share, we find that even though risky market participation is greater among single women than among single men it turns out that for those who participate, single males have a higher risky share than single women, meaning that they invest a higher proportion of their financial wealth in risky assets. The risky share for single women is 1.6 percentage points lower than for single males, all else equal, implying that the risky share is 3.7% lower for single females than for single men.

Our comparison of single males and single females also reveals that single females hold less total risk in the risky part of their financial portfolios, i.e., the volatility of the return of the risky part of the financial portfolios of single women is 19.4% lower than among single males. Furthermore, single females hold less idiosyncratic risk in the risky part of their financial portfolios, i.e., the volatility of the return of the risky part of the financial portfolios that is comprised of equity is 22.0% lower among single women than among single men. We therefore conclude that when compared to single males, single females hold less risk in their portfolios and they are better diversified.

6.2.2 Couples

When looking at the decision on market participation within households we find that as the married woman's bargaining power increases, the household's participation in equity markets decreases. More specifically, households where the woman has all the bargaining power is 39.8 percentage points less likely to participate in equity markets than households where the husband has all the bargaining power, all else equal. This implies that a 10 percentage point increase in the bargaining power of women, defined as a number between zero and 1, decreases the direct equity participation by 10.5% from the population mean for couples. When we also consider the decision on other risky asset markets we find that as the married woman's bargaining power increases, the household's participation in risky asset markets decreases. Households where the woman has all the bargaining power is 34 percentage points less likely to participate in risky asset markets than households where the husband has all the bargaining power, all else equal. This means that a 10 percentage point increase in the bargaining power of women decreases the risky asset market participation by 5.6% from the population mean for couples.

Considering asset allocation decisions within households, we find that for those households who participate in equity markets, households where women have greater bargaining power have a lower equity share, meaning that they place a lower proportion of their financial wealth in equity. More specifically, the direct equity share for households where women hold all the bargaining power is 17.5 percentage points lower than for households where all the bargaining power belongs to men, all else equal. This means that a 10 percentage point increase in the bargaining power of women leads to a decrease in the direct equity share by 8.0% from the population mean for couples. When we consider the asset allocation decision of those households who participate in either equity or other risky asset markets, we find that households where women have a greater bargaining power have a lower risky share, meaning that they place a lower proportion of their financial wealth in equity or other risky assets. More specifically, the risky share for households where women hold all the bargaining power is 30.6 percentage points lower than for households where all the bargaining power belongs to men, all else equal. This means that a 10 percentage point increase in the bargaining power of women leads to a decrease in the risky share by 8.1% from the

population mean for couples.

Finally, we consider risk taking and diversification decisions of households and find that greater bargaining power of women reduces the former and increases the latter. More specifically, our results show that as the married woman's bargaining power increases, the total risk in the household's financial portfolio decreases, i.e., the volatility of the return of the risky part of the financial portfolios of households where all the bargaining power is on the wife's side is 0.046 points lower than it is for households where all the bargaining power belongs to the husband. This means that a 10 percentage point increase in the bargaining power of women reduces the total risk by 2.3% from the population mean for all couples. Furthermore, as the married woman's bargaining power increases, the idiosyncratic risk in the household's financial portfolio also decreases, i.e., the volatility of the return of the risky part of the financial portfolios that is subject to idiosyncratic risk is 0.056 points lower among households where all the bargaining power is on the wife's side than it is for households where all the bargaining power belongs to the husband. This means that a 10 percentage point increase in the bargaining power of women reduces the idiosyncratic risk by 2.2% from the population mean for all couples.

6.3 Interpretation of Results and the Distribution of Effects

The IV estimates represent the average marginal change from an increase in female/male wage ratio for the subgroup affected by the gender labor demand ratio instrument. This subgroup is composed of couples whose financial decisions are affected by small changes in relative gender labor demand. These estimates cannot be generalized to the larger population without additional assumptions, such as a constant marginal change in financial decision making across households as a result of a change in the household bargaining power distribution. Without such an assumption, the external validity of the estimates depends upon the precision with which the affected subgroup can be characterized and on the policy interest generated by that group. However, the fact that Sweden is one of the most egalitarian countries in the world could be used to motivate that the results likely give a lower bound for global effects.

As discussed earlier, we hypothesized that a shift in bargaining power from the husband to the wife causes a larger reduction in risk in household

portfolios in households where wives are in the lower part of the threat point distribution. More specifically, the portfolio effects should not come from households at the top of the women's bargaining power distribution, but from households where women are on the margin of being able to exert their preferences when it comes to household's financial decision making, due to their low bargaining power within the marriage, and we expect these households to be in the lower part of the women's threat point distribution. The assumption of a continuous distribution for women's threat points allows us to test this. Figure 4 presents the estimates obtained for different parts of the women's threat point distribution for the different outcome variables we consider. The results support our hypothesis: portfolios of households in which the wife's wage is in the lowest quintile of the threat-point distribution are much more affected by shifts in the bargaining distribution within the household than other households. Figure 5 presents the estimates obtained for different parts of the intra-household bargaining power distribution for the different outcome variables we consider. The results support our hypothesis: portfolios of households in which the household's fall-back income ratio is in the middle quintile of the fall-back income distribution are more affected by shifts in the bargaining distribution within the household than other households.

7   Conclusion

In this paper, we have shown that the household cannot be treated as one unit when it comes to analysing the financial decisions making of households and that the relative bargaining power of spouses is an important factor in the financial decision making of a household. Previous literature has shown that financial portfolios of women tend to be less risky than those of men, all else the same and this also holds in our data. We contribute to the existing literature by showing that financial decisions made by married couples depend on the relative bargaining power of the spouses. In order to carry out this empirical test we constructed a measure of bargaining power that captures the utility of spouses at their threat points and then we employed a source of exogenous variation as an instrument for this measure to circumvent the endogeneity problems related to it. Since women, on average, prefer less risky portfolios than do men we would expect the portfolios of couples

where the bargaining power of the woman is relatively high to exhibit lower levels of risk as compared to portfolios of couples where the relative bargaining power of the woman is relatively low. This is exactly what we find when we take this hypothesis to the data.

Our results are highly statistically significant and they are also of economic significance. As the bargaining power of a married woman increases: the participation in risky asset markets decreases; given that they do participate, their share of wealth invested in risky assets decreases; the riskiness of the household portfolio decreases; and the diversification of the portfolio decreases. Furthermore, the effects come from households who are in the lower part of women's threat point distribution and who are in the middle of the household's relative bargaining power distribution.

Our findings have also some direct macro-economic implications of high policy relevance, particularly in light of the crisis of the last few years which had it roots in financial decisions that households made with respect to purchasing and financing their homes. Our findings imply that in order to understand how households make financial decisions they cannot be treated as single units. Furthermore, any changes that might alter the power balance within households can affect the financial risk taking of household portfolios and thereby their fragility. This can therefore affect probability of an economical crisis caused by household decisions. The results imply that the empowerment of women reduces the risk taking of households and their financial fragility, promoting a financial system that is more stable and less prone to crisis

The literature on household bargaining has not been focused on household decisions that affect their portfolio composition and their financial security. Given the importance of the financial position of a household further research on the internal financial decision making of households would be of great value. Future work within this field could extend our analysis in several ways, for instance in the direction estimating the effect of bargaining power of ex-post performance of household portfolios. Important contributions could also be made by exploiting natural experiments where the relative bargaining power of spouses has been affected and investigate how this has affected composition of household portfolios.

We have managed to look inside the black-box of how couples take financial decisions in this current study but it would be interesting to open

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the box much more. We have shown that the bargaining power of spouses does affect the composition of the financial portfolios of households but there could be additional channels through which the composition is affected that might be interesting to study. For instance, information might play an important role. It could be the case that single men and single women obtain information in different ways. This might imply that once people are in a relationship, their information accumulation changes and this could potentially affect their preferences concerning financial investments. One possible channel through which this could happen is peer effects as the composition of the peer group of a single individual is very likely to be affected by their relationship status. Another possible channel for how the preferences of an individual concerning financial investments are affected by his relationship status is division of labor market risk, as couples are able to pool their labor market risk whereas singles cannot. These interesting extensions are left to future work.

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Table 1: Aggregate Wealth Statistics 2000-2003 (in billions of U.S. dollars)

	2000		2001		2002		2003	
	Micro Data	Official Statistics	Micro Data	Official Statistics	Micro Data	Official Statistics	Micro Data	Official Statistics
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial assets:								
Bank accounts	44.6	42.2	44.0	41.6	3 916.8	49.1	69.9	66.5
Mutual funds	57.3	55.5	47.0	43.5	3 268.9	39.0	58.4	60.8
Stocks	57.3	55.7	42.0	40.9	2 493.9	31.8	50.8	47.6
Bonds and derivatives	8.2	9.2	6.9	7.6	633.7	9.3	10.0	11.0
Taxable insurance	16.6	16.3	14.1	13.9	1 011.0	13.3	17.1	17.0
Real estate:								
Residential	228.2	223.0	216.0	211.3	21 278.0	275.1	362.4	352.8
Non-residential	81.6	79.2	76.9	74.6	7 689.2	98.4	127.8	123.1
Total real estate	309.8	302.2	292.8	285.9	28 967.2	373.5	490.2	475.9
Total gross wealth	518.0	498.4	465.2	449.0	41 434.2	528.6	716.4	691.8
Total wealth	394.4	360.7	354.0	319.0	31 270.1	366.8	554.3	477.4
Households:								
Observations	4 817 135	4 817 135	4 843 010	4 843 010	4 869 448	4 869 448	4 893 661	4 893 661
Gross wealth	$107 538	$103 461	$96 062	$92 704	$8 509 007	$108 553	$146 400	$141 364
Net wealth	$81 874	$74 875	$73 100	$65 877	$6 421 700	$75 322	$113 272	$97 546

Note: The table reports aggregate wealth statistics for Swedish households on December 31 for 2000, 2001, 2002 and 2003. We convert all financial variables into billions of U.S. dollars using the exchange rate at the end of each year (2000: 1 SEK = $ 0.1060, 2001: 1 SEK = $ 0.0953, 2002: 1 SEK = $ 0.1148, 2003: 1 SEK = $ 0.1390). In columns 1, 3, 5 and 7, we aggregate up the value of the asset holdings observed for all individuals in our micro data set. Columns 2, 4, 6 and 8 report the corresponding official statistics published by Statistics Sweden.

Table 2: Aggregate Wealth Statistics 2004-2006 (in billions of U.S. dollars)

	2004		2005		2006	
	Micro Data (1)	Official Statistics (2)	Micro Data (3)	Official Statistics (4)	Micro Data (5)	Official Statistics (6)
Financial assets:						
Bank accounts	67.6	64.2	58.5	55.7	106.1	101.0
Mutual funds	68.5	66.4	71.8	68.9	89.5	86.3
Stocks	66.3	62.2	71.2	66.7	97.8	90.4
Bonds and derivatives	12.5	12.2	12.2	12.0	16.6	14.8
Taxable insurance	18.7	18.6	15.4	15.4	17.6	17.9
Real estate:						
Residential	437.9	441.7	423.3	413.3	546.9	535.6
Non-residential	153.0	147.3	148.7	143.6	189.1	183.3
Total real estate	590.9	589.0	572.0	556.9	736.0	718.9
Total gross wealth	844.7	827.2	816.6	788.4	1 082.8	1 043.6
Total wealth	669.2	572.6	670.1	553.5	912.4	745.6
Households:						
Observations	4 915 190	4 915 190	4 945 947	4 945 947	4 989 488	4 989 488
Gross wealth	$171 859	$168 293	$165 113	$159 398	$217 019	$209 168
Net wealth	$136 146	$116 496	$135 479	$111 915	$182 855	$149 444

Note: The table reports aggregate wealth statistics for Swedish households on December 31 for 2004, 2005 and 2006. We convert all financial variables into billions of U.S. dollars using the exchange rate at the end of each year (2004: 1 SEK = $ 0.1505, 2005: 1 SEK = $ 0.1257, 2006: 1 SEK = $ 0.1461. In columns 1, 3 and 5, we aggregate up the value of the asset holdings observed for all individuals in our micro data set. Columns 2, 4 and 6 report the corresponding official statistics published by Statistics Sweden.
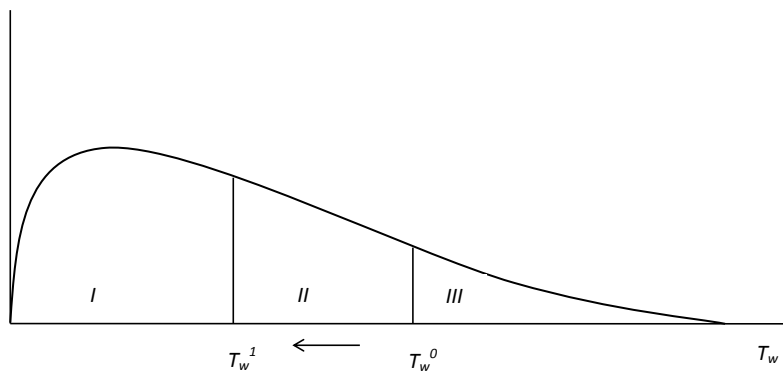
Figure 1: Effects of a shift in bargaining position for different parts of the threat point distribution of wives

Before the exogenous shift in sex specific labor demand, in favor of women, a woman who is indifferent between divorce and being part of a marriage where she cannot influence the financial decision taking (hereafter, the marginal woman) had a threat point denoted by T_w^0. When the shift occurs the marginal woman will be to the left of the previous marginal woman, say at T_w^1. For husbands whose wife's outside option lies in between T_w^0 and T_w^1, it was optimal to make risky investments before the shift but now this is no longer the case. Women in part II will therefore benefit from this shift on bargaining position. For women in part I, the shift is not sufficiently large for their divorce threats to become credible and render them able to enforce their preferences when it comes to household financial decision making. The shift also has no effect for women in part III since they were were able to enforce their preferences from the beginning due to their good bargaining position within the household.
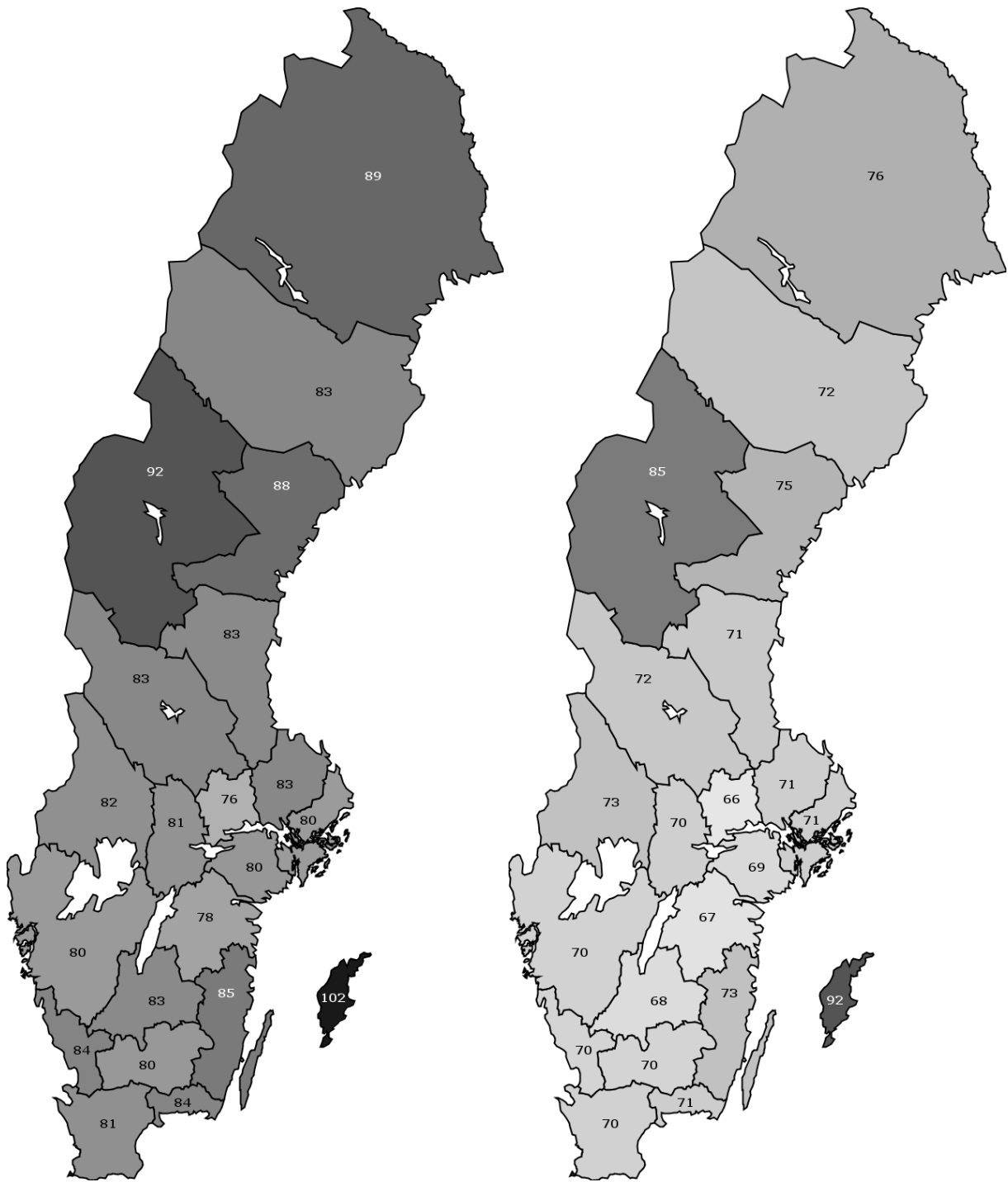
Figure 2: Fall-back and actual income ratios by counties

The graph to the left shows the average fall-back income ratios of households in each county in Sweden. A darker color means that the fall-back incomes of spouses are more similar in the county under consideration. The graph to the right shows the average actual income ratios of households in each county in Sweden. A darker color means that the actual incomes of spouses are more similar in the county under consideration. The numbers displayed are percentages and are for the year 2006.
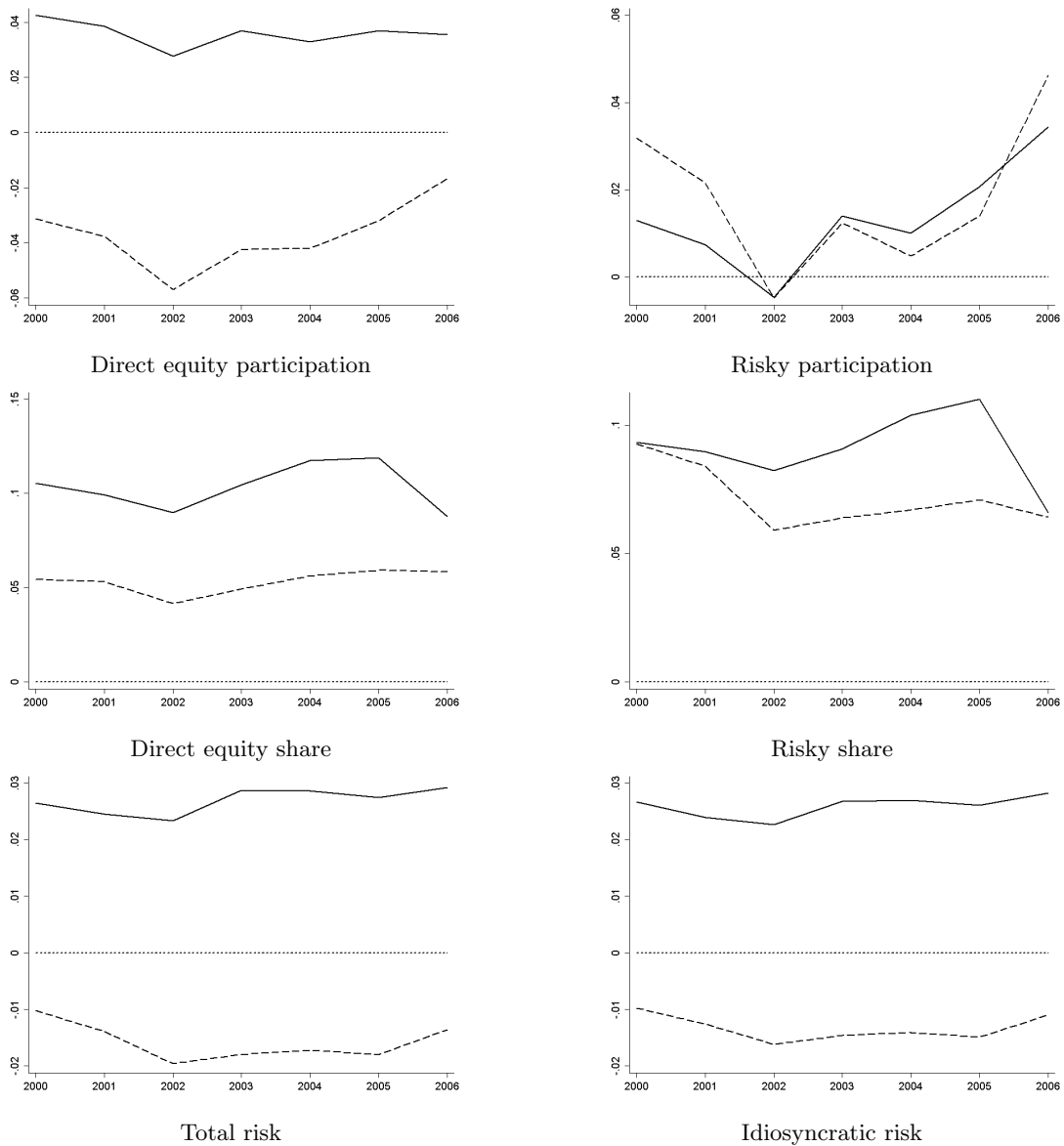
Figure 3: The graphs are rescaled such that the outcomes for couples have mean zero, the solid line represents single men and the dashed line represents single women. We control for wealth, age, whether individuals have ever been married, whether they have children and whether they are homeowners.

Table 3: Summary Statistics

	Married Individuals			Single Males			Single Females		
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation
Portfolio characteristics:									
Financial wealth ($)	39 685	9 194	4 806 182	28 923	3 409	491 169	21 495	3 104	459 467
Direct equity ($)	15 498	0	4 742 705	8 664	0	460 193	4 736	0	433 492
Direct equity share	0.22	0.13	0.24	0.30	0.20	0.28	0.26	0.16	0.26
Direct equity participation	0.38	0.00	0.48	0.23	0.00	0.42	0.16	0.00	0.37
Risky assets ($)	22 175	618	4 761 868	14 508	0	472 386	9 527	0	436 407
Risky share	0.38	0.33	0.28	0.44	0.42	0.31	0.42	0.40	0.29
Risky participation	0.61	1.00	0.49	0.43	0.00	0.50	0.42	0.00	0.49
Total risk	0.20	0.19	0.11	0.21	0.19	0.13	0.16	0.16	0.10
Idiosyncratic risk	0.16	0.14	0.10	0.17	0.15	0.12	0.13	0.12	0.09
Weighted Total risk	0.08	0.06	0.08	0.10	0.08	0.09	0.08	0.06	0.08
Weighted Idiosyncratic risk	0.06	0.05	0.07	0.08	0.06	0.07	0.06	0.05	0.06
Financial characteristics:									
Disposable income ($)	32 905	29 484	103 638	25 523	24 422	102 096	23 436	23 146	24 311
Salary income ($)	34 982	33 678	27 749	26 498	26 059	28 737	21 552	19 533	21 125
Real estate wealth ($)	140 114	96 456	368 965	74 461	0	371 670	63 360	0	193 634
Total liabilities ($)	64 409	42 279	168 541	38 734	10 817	122 159	31 622	9 644	84 351
Unemployment dummy	0.20	0.00	0.32	0.31	0.00	0.46	0.31	0.00	0.46
Entrepreneur dummy	0.11	0.00	0.23	0.09	0.00	0.29	0.05	0.00	0.22
Student dummy	0.02	0.00	0.11	0.14	0.00	0.35	0.19	0.00	0.39
Demographic characteristics:									
Age	46.95	47.50	10.14	37.93	36.00	13.68	38.57	38.00	14.33
Household size	3.28	3.00	1.18	1.29	1.00	0.70	1.55	1.00	0.92
High school dummy	0.83	1.00	0.30	0.75	1.00	0.43	0.79	1.00	0.41
Post-high school dummy	0.38	0.50	0.41	0.27	0.00	0.44	0.35	0.00	0.48
Immigrant dummy	0.19	0.00	0.35	0.15	0.00	0.36	0.16	0.00	0.37

Note: The table reports summary statistics of the main financial and demographic characteristics of Swedish households at the end of 2006. We convert all financial variables into U.S. dollars using the exchange rate at the end of 2006 (1 SEK = $ 0.1463). The computations are based on all individuals between the ages of 16 and 65 considered throughout the empirical analysis. Missing bank balances are imputed using the constant imputation method discussed in the data section. All logarithms are computed in the natural base. We consider couples to be a man and a woman who are married and singles to be those who are living alone or are living with someone but without a common child. The reported numbers for married individuals are the numbers for them and their spouse divided by two.

Table 4: Descriptives - Income

	(1)	(2)	(3)	(4)	(5)	(6)
	M>F	M>0.7	F>0.7	M>F	M>0.7	F>0.7
		*(M+F)	*(M+F)		*(M+F)	*(M+F)
2000	68.3%	31.0%	14.4%	67.9%	12.0%	4.7%
2001	68.1%	30.9%	14.3%	67.7%	11.9%	4.6%
2002	67.7%	30.7%	14.5%	67.2%	11.3%	4.5%
2003	67.2%	30.6%	14.7%	66.8%	11.3%	4.5%
2004	66.8%	30.6%	14.7%	66.2%	11.5%	4.7%
2005	66.9%	30.9%	14.4%	66.5%	12.0%	4.5%
2006	66.9%	30.5%	14.1%	66.2%	11.8%	4.6%

(1)-(3): income, (4)-(6): fall-back income.

Table 5: Descriptives - age and education

	(1) M age> F age + 5	(2) F age > M age + 5	(3) M edu > F edu	(4) F edu > M edu
2000	17.5%	2.1%	22.7%	31.0%
2001	17.5%	2.2%	22.4%	31.2%
2002	17.5%	2.2%	22.2%	31.3%
2003	17.6%	2.2%	21.9%	31.6%
2004	17.7%	2.3%	21.7%	31.8%
2005	17.9%	2.3%	21.5%	31.8%
2006	18.1%	2.4%	21.2%	32.0%

(1) shows the proportion of couples where the male is more than five years older, (2) shows the proportion of couples where the female is more than five years older, (3) shows the proportion of couples where the male has higher education and (4) shows the proportion of couples where the female has higher education.

Table 6: Comparison of IV measure of the female/male wage ratio and the actual ratio

	2000	2001	2002	2003	2004	2005	2006
IV	0.893	0.893	0.906	0.902	0.904	0.901	0.898
Actual	0.829	0.841	0.858	0.872	0.882	0.883	0.887

Actual salary ratios are conditional on both spouses being employed.

Table 7: Impact of female's power on financial risk taking of the household

	(1) Direct Equity Participation	(2) Risky Participation	(3) Direct Equity Share	(4) Risky Share	(5) Total Risk	(6) Idiosyncratic Risk
Panel A: Singles						
OLS	-0.0642	0.0135	-0.0496	-0.0164	-0.0408	-0.0374
	(0.0022)	(0.0029)	(0.0011)	(0.0012)	(0.0010)	(0.0010)
R^2	0.2137	0.2429	0.0264	0.0927	0.0634	0.0610
Observations	16 931 968	16 931 968	3 782 501	7 741 272	8 271 210	8 271 209
Individuals	2 492 115	2 492 115	579 251	1 151 820	1 204 549	1 204 549
Panel B: Couples						
OLS	-0.0111	0.0361	-0.0504	-0.0172	-0.0228	-0.0221
	(0.0045)	(0.0025)	(0.0025)	(0.0015)	(0.0018)	(0.0016)
R^2	0.2667	0.2772	0.0641	0.1737	0.0263	0.0254
IV	-0.4488	-0.35745	-0.1593	-0.3255	-0.0418	-0.0302
	(0.0523)	(0.0362)	(0.0383)	(0.0391)	(0.0121)	(0.0121)
R^2	0.2467	0.2575	0.0590	0.1458	0.0254	0.0253
Observations	6 232 765	6 232 765	3 020 791	4 436 489	4 577 526	4 577 526
Households	928 164	928 164	456 279	684 693	678 189	678 189

Notes: Standard errors are clustered at the municipality level and are within parentheses. Each entry is separate regression. In the IV model the fall-back wage ratio is instrumented using the prevailing local wage ratio. The direct equity share is defined as the value stocks divided by total financial wealth. The risky share is defined as stocks, equity funds, hedge funds and mixed funds divided by total financial wealth. Direct equity (risky) participation is equal to one for those whose direct equity (risky) share is positive and zero otherwise. Equity portfolio turnover is calculated as the sum of all household trades during the year divided by market value of the household portfolio at year end. Total risk is defined as the volatility of the risky part of the portfolio, measured as the annualized standard deviation of the return of the risky part of the portfolio. This measure captures the volatility of the risky part of the household portfolio. Idiosyncratic risk is defined as the volatility of the part of the portfolio that is subject to idiosyncratic risk, measured as the annualized standard deviation of the return of the part of the portfolio that is subject to idiosyncratic risk. This measure captures the volatility of the risky part of the household portfolio that is due to idiosyncratic risk.

Table 8: Effects of a shift in bargaining position for different parts of the threat point distribution of wives

Variable	0-20th percentile	20-40th percentile	40-60th percentile	60-80th percentile	80-100th percentile
Direct Equity Share	-0.3855	-0.2440	-0.2243	-0.1712	-0.0930
Risky Share	-0.7847	-0.3731	-0.3394	-0.2967	-0.2438
Equity Participation	-2.4295	-0.5215	-0.5014	-0.4084	-0.2703
Risky Participation	-2.2573	-0.4924	-0.4346	-0.4614	-0.3125
Idiosyncratic Risk	-0.1042	-0.0692	-0.0624	-0.0253	0.0065

Note: The table reports IV point estimates for different parts of the threat point distribution of wives. Standard errors are clustered at the municipality level and are within parentheses. Each entry is separate regression for households where wives have threat points between the percentiles stated. In the IV model the fall-back wage ratio is instrumented using the prevailing local wage ratio.
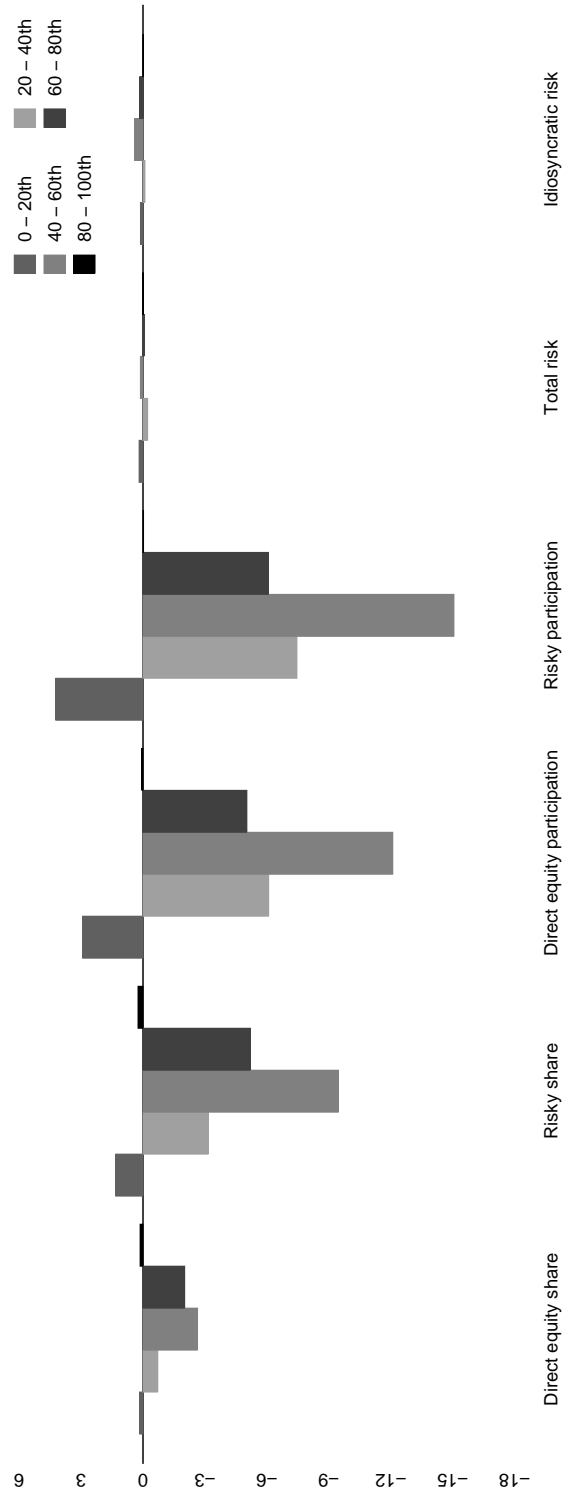
Figure 4: Effects for different parts of the threat point distribution of wives

The graph shows the effect of bargaining power on different outcomes variables of households for the different quintiles of the threat point distribution of wives.
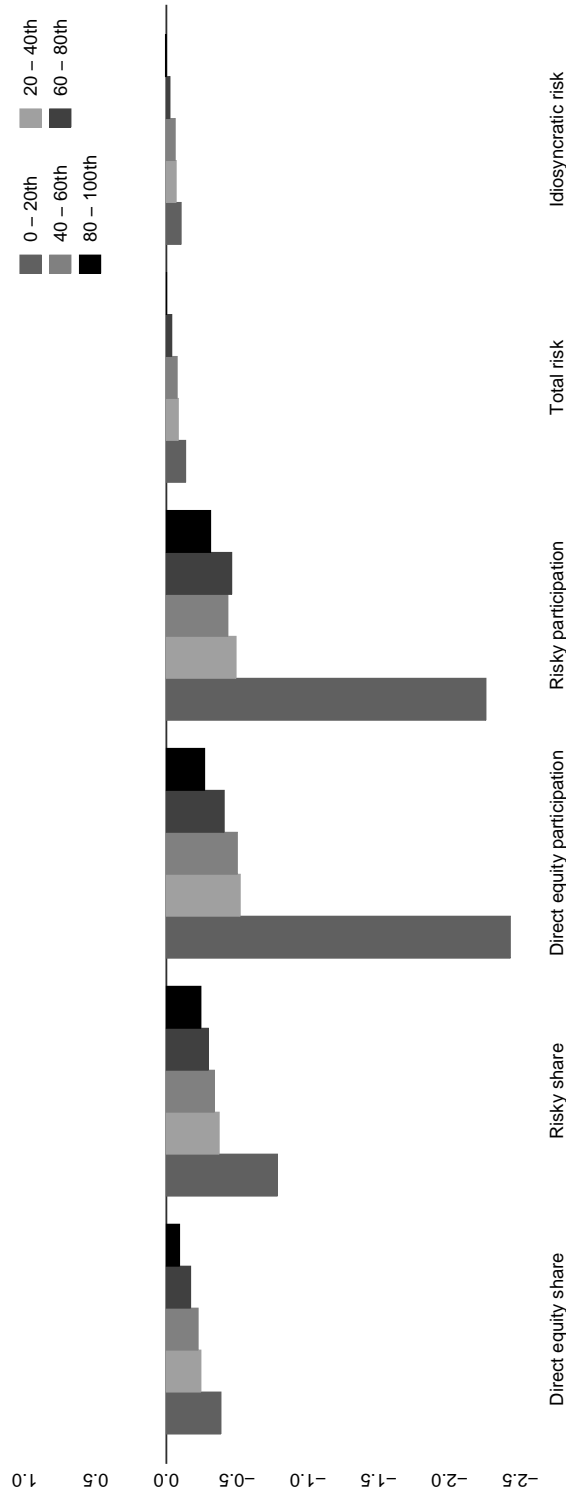
Figure 5: Effects of a shift in bargaining position for different parts of the distribution of fall-back income ratio

The graph shows the effect of bargaining power on different outcome variables of households for the different quintiles of the distribution of bargaining power ratio of households.