

Household Resources and Investments in Children's Higher Education: The Role of Intra-Household Bargaining

Tung Dang*

November 2024

Abstract

This paper studies the impact of improved women's intra-household bargaining power on children's university enrollment. Using survey data from Indonesia and a shift-share instrumental variable approach, I construct a measure of shocks to women's outside options that are unrelated to indicators of household resources or children's ability but significantly correlated with self-reported decision-making power among married women. I find that increases in mothers' bargaining power around the time of children's high school graduation significantly raise the likelihood of university enrollment for both sons and daughters, with effects more pronounced among households that are less likely to face short-term binding resource constraints. These results underscore the importance of accounting for intra-household bargaining dynamics and spousal differences in demand for children's education when interpreting the effects of household resources on higher education participation.

Keywords: Household resources, Intra-household bargaining, University enrollment.

*Postdoctoral research fellow, the University of Sydney School of Economics and ARC Life Course Centre. Email: tung.dang@sydney.edu.au. I am grateful to Jawad Addoum, Chris Barrett, Arnab Basu, Nancy Chau, Shyamal Chowdhury, Deborah Cobb-Clark, Sarah Dahmann, Esther Mirjam Girsberger, Ravi Kanbur, Mallika Thomas and seminar participants for helpful comments and suggestions. All errors are my own.

1 Introduction

Across many cultural and economic settings, children from wealthier families are more likely to pursue postsecondary education (Shavit and Blossfeld 1993; Carneiro and Heckman 2002; Björklund, Lindahl, and Plug 2006; Bulman et al. 2021). Given that a postsecondary degree often leads to higher wages and many other important non-pecuniary benefits (Oreopoulos and Salvanes 2011), understanding how family resources affect children’s enrollment is crucial for educational policy while also providing insights into the intergenerational transmission of inequality, economic growth, and many other economic phenomena. On one hand, investing in higher education can be prohibitively costly. Families may not be able to realize their children’s potential due to short-term financial constraints, particularly when credit markets are missing or imperfect (Acemoglu and Pischke 2001; Belley and Lochner 2007; Coelli 2011; Lovenheim 2011; Bastian and Michelmore 2018; Manoli and Turner 2018). On the other hand, family resources tend to be correlated over a child’s life cycle. A positive resource-schooling gradient may also arise from long-run factors, such as preferences, abilities, and school and peer quality, which are associated with both family resources and the tendency to pursue postsecondary education (Carneiro and Heckman 2002; Cameron and Taber 2004; Bleakley and Ferrie 2016). Effective policies aimed at improving access to higher education and fostering upward mobility could vary significantly depending on the relative importance of these underlying mechanisms.

In this article, I explore the role of intra-household bargaining dynamics, particularly mothers’ decision-making power, in shaping children’s postsecondary education enrollment. Recent studies have shown that, within households, parents may exhibit differences in their demand for children’s education. These could arise due to differences between fathers and mothers in underlying preferences, such as altruism (e.g., Dizon-Ross and Jayachandran 2023), or beliefs regarding the returns to educational investments (e.g., Attanasio, Boneva, and Rauh 2022). If couples disagree on whether and how much to invest, the causal impact of household resources on higher educational investments may hinge critically on who controls resources and decision-making. In-

deed, a substantial body of literature has documented positive effects of improvements in female bargaining power on children's educational attainment and welfare ([Thomas 1990](#); [Lundberg, Pollak, and Wales 1997](#); [Duflo 2003](#); [Quisumbing and Maluccio 2003](#); [Ward-Batts 2008](#); [Qian 2008](#); [Majlesi 2016](#); [Wang and Cheng 2021](#)), though it remains unclear whether these findings are empirically relevant in the context of higher education investments.

To assess the importance of intrahousehold bargaining dynamics, I analyze a combination of household and labor force survey data from Indonesia, a setting in which the gender wage gap has declined substantially over the past few decades. As Figure 1 shows, women's median hourly earnings in Indonesia grew from about 55% of men's earnings in 1990 to 80% in 2014. Following this convergence, standard Nash-bargaining models predict an overall improvement in women's outside options and, consequently, their decision-making power among married couples ([Manser and Brown 1980](#); [McElroy and Horney 1981](#); [Lundberg and Pollak 1993](#)).¹ My analysis thus focuses on changes in women's earning potential, predicted by Bartik-style instruments, as a source of variation in decision-making power and relates these to changes in couples' self-reported decision-making and children's enrollment in postsecondary education. Figure 2 shows some prima facie evidence of the effects of strengthened female bargaining power on children's enrollment. Concurrent with the significant decline in the gender wage gap, the proportion of young adults (aged 22-30) who have obtained a bachelor's degree also rose dramatically from about 1% in 1990 to 9% in 2014. Importantly, this trend is observed among both men and women, suggesting that factors beyond potential changes in the returns to or opportunity costs of pursuing postsecondary education for women are driving the surge in educational attainment.

I begin my empirical analysis by examining whether changes in women's potential earnings relative to their husbands affect household decision-making over time. Controlling for location and household fixed effects, positive shocks to women's relative potential earnings significantly enhance their decision-making authority in the household. This effect is observed in both husbands' and wives' survey responses and is particularly pronounced regarding decisions over children's

¹A well-established body of empirical studies supports these predictions. See, for example, [Anderson and Eswaran \(2009\)](#), [Aizer \(2010\)](#), [Majlesi \(2016\)](#), [Doepke and Kindermann \(2019\)](#), and [Zhao and Qu \(2024\)](#).

education. Furthermore, consistent with the theoretical prediction that bargaining power is determined by outside options rather than earnings in equilibrium, I find both working and non-working women become more involved in household decision-making in response to their improved (relative) earnings potential (Pollak 2005; Aizer 2010; Majlesi 2016).

Having established shocks to women's labor market conditions as a source of variation in their decision-making power, I next examine whether intra-household bargaining dynamics determine children's university enrollment. To isolate the impact of household resource reallocation, my main analysis focuses on estimating the effects of an increase in mothers' bargaining power when children graduate from senior high school. The reason for this focus is twofold: First, while increases in mothers' bargaining power in earlier periods may result in important early human capital investments that foster children's university preparedness, it is theoretically possible for subsequent investments in higher education to be vetoed by fathers if changes in bargaining power are only temporary (Mazzocco 2007; Lise and Yamada 2019). Second, children from resource-constrained families may especially benefit from additional cash-on-hand to cover the upfront costs of higher education at the time of enrollment (Coelli 2011; Lovenheim 2011; Manoli and Turner 2018). Indeed, my results indicate that an improvement in mothers' relative potential earnings when children reach 17 has a significant positive impact on their likelihood of attending a university. This effect is observed for both sons and daughters, and particularly pronounced among households that are less likely to face short-term budget constraints.

I provide several pieces of evidence to rule out alternative mechanisms, including potential confounding from household and local labor market characteristics and endogenous changes in mothers' labor supply. First, balance tests reveal that my measure of mothers' decision-making power does not predict with key determinants of children's university enrollment, such as household resources and academic ability. Second, when measured at ages before or after 17, mothers' decision-making power shows no significant association with either university enrollment or high school completion. Third, the effect of mothers' relative potential earnings is observed irrespective of whether mothers were working when individuals completed high school. These findings collec-

tively support the reallocation of household resources toward educational investments following improvements in mothers' outside options as the primary explanation of my empirical results.

My findings contribute to several strands of literature. First, while an extensive literature has examined the various pathways through which household resources determine participation in higher education, little consensus on the exact mechanism at play has been reached (e.g., [Carneiro and Heckman 2002](#); [Belley and Lochner 2007](#); [Løken 2010](#); [Lovenheim 2011](#); [Manoli and Turner 2018](#); [Bulman et al. 2021](#)). My results suggest that disagreements between parents regarding how much to invest in children's university education likely exist, and that the intra-household distribution of parents' bargaining power is a crucial determinant of the extent to which household resources translate into investments. This insight provides a nuanced understanding of the role of household resource constraints in limiting higher education access: relaxing these constraints requires not only increasing total household resources but also ensuring that a greater share is controlled by the parent more committed to investing in children's education. In addition, my paper also relates to the broader literature on the determinants of the intergenerational transmission of economic outcomes ([Björklund and Salvanes 2011](#); [Black and Devereux 2011](#), [Alesina et al. 2021](#); [Attanasio, Cattan, and Meghir 2022](#)). My results indicate that factors influencing parents' bargaining power, such as shocks to their relative labor market conditions, may drive disparities in educational and labor market outcomes among otherwise similar children.

Second, this paper relates to a broad literature that has documented the limitations of unitary models in explaining household behaviors, including saving, investment, and consumption decisions (e.g., [Alderman et al. 1995](#); [Lundberg, Pollak, and Wales 1997](#); [Duflo 2003](#); [Ward-Batts 2008](#); [Attanasio and Lechene 2014](#); [Addoum 2017](#); [Schaner 2017](#); [Doepke and Kindermann 2019](#); [Calvi 2020](#); [Zhao and Qu 2024](#)). My findings identify children's higher education as another domain where substantial heterogeneity in household members' preferences may exist. In addition, the results emphasize the critical role of labor market conditions and potential earnings in shaping spouses' outside options and bargaining power within the household. This aligns with research on gender gaps in labor market outcomes and their effects on household dynamics, where reduc-

ing gender inequalities has been linked to better developmental outcomes, such as improvements in children’s health and well-being (Qian 2008; Duflo 2012; Heath and Mobarak 2015; Wang and Cheng 2021; Zhao and Qu 2024). This paper extends this literature by identifying children’s later-life outcomes as an additional pathway through which addressing gender inequality can foster upward mobility and promote economic development.

The rest of the paper is organized as follows. Section 2 describes data sources and key variable definitions. Section 3 outlines my empirical strategy, including identification challenges and a shift-share instrumental variable estimation approach aimed at addressing these. Empirical results are discussed in section 4, followed by concluding remarks in section 5.

2 Data

My empirical investigation combines individual- and household-level data from the Indonesian Family Life Survey (IFLS) with labor force survey data from the Indonesian Labor Force Survey (SAKERNAS). In this section, I provide a brief overview of the data sources and key variables used throughout my main analysis.

2.1 Indonesian Family Life Survey

The primary data source used in this paper is the IFLS, a longitudinal household survey first conducted in 1993 by the RAND Corporation in collaboration with the University of Indonesia. The initial sample includes over 7,200 households, designed to represent 13 provinces in Indonesia (about 83% of the Indonesian population) at the time. Subsequent waves of the survey were conducted in 1997, 2000, 2007, and 2014, which collected data on all original households as well as newly formed households that included original members.² The rich content of the IFLS makes it particularly suited for my analysis. The dataset contains information on individuals’ educational

²For more information on the IFLS, see <http://www.rand.org/labor/FLS/IFLS/>.

outcomes, along with a broad set of individual, parent, and household characteristics that allows me to control for important factors influencing the likelihood of pursuing higher education. Furthermore, beginning in 1997, the IFLS added a survey module that tracks how households make decisions regarding expenditures and time use. In households with married couples, self-reported data on which members participate in decision-making across different domains are collected from both husbands and wives. As discussed in the next section, these data enable me to empirically establish the crucial first-stage relationship between changes in spouses' outside options and intra-household bargaining power, as reflected by observed shifts in the identities of the decision-makers within households over time.

To analyze the impact of changes in parents' relative decision-making power on children's participation in higher education, I focus on analyzing the educational outcomes of individuals who had completed senior high school as of 2014 (IFLS-4). I restrict my sample to those aged 18 to 39, for whom parental earnings and household wealth during their adolescent years are observable. The primary outcome analyzed is whether individuals reported having enrolled in a 4-year university in IFLS-4. I focus on enrollment instead of completion, since enrollment better reflects household demand for education, while completion may depend on factors unrelated to parents' investment decisions ([Light and Strayer 2000](#); [Bound, Lovenheim, and Turner 2010](#)).

In addition to educational outcomes, I also use the IFLS to construct a large set of controls for background characteristics. These include basic demographic characteristics such as age, sex, and ethnicity; height; the type of school attended at the primary, junior, and senior high levels; and key parental characteristics, including age, years of formal education, and income. I also control for number of siblings, household assets and the district of the individual's residence. Summary statistics for the main sample of my analysis, which contains 4,385 individuals, are provided in Appendix Table 1.

One limitation of the IFLS is the significant time gap between survey waves, which means that some key time-varying characteristics, such as parental income and household assets, cannot be observed at the same age for all individuals (e.g., at the time of high school graduation). To

address this, I use data from the most recent survey wave available before an individual turns 18 to construct these controls. Although these controls are not measured at the same exact age for all individuals, this does not appear to significantly undermine my estimation. As discussed in the next section, I rely on labor demand shocks specific to parents' demographic groups, combined with a shift-share instrumental variable, to predict changes in parents' decision-making power. This approach mitigates omitted variable bias related to unobserved household and individual factors. As I demonstrate later in the paper, the variation in maternal bargaining power predicted by the instrument appears uncorrelated with the household and individual characteristics that are key determinants of university enrollment. Moreover, my point estimates remain stable when accounting for time-varying household and individual controls.

2.2 SAKERNAS

I use data from the 1990-2014 Indonesian Labor Force Survey (SAKERNAS) to measure changes in parents' relative labor market conditions and to construct a shift-share instrument. The key information drawn from SAKERNAS is the average hourly wage in the formal sector at the province-demographic-group level. Hourly wage is computed by dividing total monthly earnings by the total hours worked times 4.3. Additionally, I use SAKERNAS to construct time-varying controls for local labor market conditions individuals face when graduating senior high school (at age 17). These include the province-level unemployment rate for individuals aged 15 to 21 without a university degree, the share of workers with a university degree, and the female labor force participation rate.

3 Methodology

3.1 Measuring outside options

As mentioned earlier, the gender wage gap in Indonesia narrowed substantially between 1990 and 2014 (Figure 1). As a result, a large fraction of married couples would likely have experienced improvements in relative labor market conditions in favor of the wife during this period. Standard Nash bargaining models of household decision-making predict that these improvements raise the maximal level of utility women can attain at their threat points, either in the event of a divorce ([Manser and Brown 1980](#); [McElroy and Horney 1981](#)) or in a non-cooperative equilibrium internal to a marriage ([Lundberg and Pollak 1993](#)), as couples bargain over the allocation of household resources. Consequently, better outside options enable women to exert more decision-making power, leading to bargaining outcomes that better align with their preferences. Many empirical studies have indeed substantiated these predictions, linking improvements in women’s relative labor market conditions to increased private consumption ([Anderson and Eswaran 2009](#); [Zhao and Qu 2024](#)), increased household expenditure on children ([Wang and Cheng 2021](#)) as well as their survivability and early educational outcomes ([Qian 2008](#); [Zhao and Qu 2024](#)), and reduced domestic violence ([Aizer 2010](#)).

To assess the role of intrahousehold bargaining dynamics in shaping children’s participation in higher education, I focus on analyzing parents’ relative potential earnings as a determinant of their decision-making power. Although the narrowing of the gender wage gap in Indonesia may have improved women’s actual earnings relative to their husbands’, earnings observed within a cooperative equilibrium may not necessarily reflect earnings at unobserved threat points. As discussed in [Pollak \(2005\)](#), threat point earnings can shift due to changes in labor supply or employment status. In contrast, market wages are exogenous to a household’s joint labor supply decisions and, crucially, to the underlying bargaining process, making them a more appropriate measure of outside options.

To construct potential earnings, I first assign each parent to a demographic group defined by age, gender, education level, and province of residence.³ Potential earnings are then calculated as the average hourly wage of workers with the same characteristics in the formal sector, constructed using SAKERNAS data. The key explanatory variable in my analysis, individual i 's mother's relative potential earnings, is calculated by dividing the mother's potential earnings by the sum of both parents' potential earnings

$$(1) \quad \text{mother's rel. pot. earnings}_i = \frac{\text{mother's pot. earnings}_i}{\text{father's pot. earnings}_i + \text{mother's pot. earnings}_i}$$

A priori, it is unclear when parents' relative potential earnings should be measured. In my analysis, I focus on estimating the impact of parents' decision-making power measured at the time most individuals graduate from senior high school (i.e., at the age of 17). The rationale for this focus is twofold. First, existing evidence suggests that families and individuals often finalize their university enrollment decisions during the last year of high school, such that changes in cash-on-hand can significantly affect enrollment decisions (Manoli and Turner 2018). Second, and more importantly, parents may bargain without perfect commitment (Mazzocco 2007; Lise and Yamada 2019). As a result, changes in their outside options may prompt renegotiations over whether and how much households invest in children's higher education. Nonetheless, in some specifications, I report results based on measuring parents' decision-making power before and after individuals' last year of senior high school. These specifications allow me to explore the potential dynamic effects of parents' decision-making power (when measured before) and also assess the validity of the instrumental variable estimation strategy (when measured after), which I outline later in the section.

Figure 3 plots the evolution of the average mothers' relative potential earnings across cohorts of children. As expected, given the observed narrowing of the gender wage gap over this period, later cohorts saw substantial improvements in mothers' potential earnings relative to fathers'.

³I use 5-year age intervals ranging from 26 to 55 and five educational levels (no schooling, primary school, junior high school, senior high school, bachelor's degree and above).

Comparing the last cohort to the first in my sample, the difference in mothers’ relative potential earnings was 5 percentage points on average (0.35 versus 0.40), representing a 14 percent increase.

3.2 Estimation strategy

To assess the importance of the distribution of parents’ intra-household bargaining power in explaining children’s participation in higher education, I estimate the following regression equation

$$(2) \quad \text{university enrollment}_i = \beta_1 \text{mother's rel. pot. earnings}_i + \beta_2 \text{parents' total pot. earnings}_i \\ + \Gamma' X_i + \gamma_d + \theta_c + \epsilon_i$$

where the outcome variable is an indicator that equals 1 if individual i reports having enrolled in a university (as recorded in IFLS4), and 0 otherwise. The key independent variable is the mother’s potential relative earnings, measured when individual i was 17, as defined earlier. In estimating β_1 , I control for both parents’ combined potential earnings, which account for potential confounding shocks correlated with parents’ overall local labor market conditions. I include district (γ_d) and cohort (θ_c) fixed effects, which control for local time-invariant characteristics as well as time-varying confounds, such as changes in policy, economic conditions, and preferences, that are common among individuals turning 17 in the same year.⁴ X_i is a vector of covariates that control for individual, parent, household, and local characteristics. In particular, individual characteristics include sex, ethnicity, number of siblings, height, and the types of primary school, junior high school, and senior high school attended (public religious, private non-religious, and private religious).⁵ Parent characteristics include each parent’s age indicators, years of formal education, and both parents’ combined inflation-adjusted earnings. Lastly, I include household assets, which existing research

⁴District fixed effects capture local characteristics at a more granular level than province fixed effects. Moreover, with 187 districts in my sample, I can cluster standard errors at the district level to account for potential correlated shocks within geographic areas and avoid concerns with small cluster counts.

⁵Height has been shown to be a marker of cognitive ability and a predictor of labor market outcomes (Case and Paxson 2008). Newhouse and Beegle (2006) highlight school type as an important factor behind academic achievement in Indonesia.

has shown to affect higher education enrollment beyond household income (Lovenheim 2011), as well as province-level labor market characteristics as listed in the previous section.

Given this setup, identification of the key coefficient, β_1 , relies on temporal variations in mothers' relative potential earnings among individuals with similar parental characteristics residing in the same geographic area. As such, OLS estimates may be biased due to the influences of unobserved time-varying household or local labor market confounds. For instance, unobserved shifts in marriage and household formation patterns could reflect concurrent changes in women's relative potential earnings and household demands for children's education. Additionally, regions experiencing faster gender wage convergence during my study period tend to have larger initial gender wage gaps, implying the presence of stronger traditional gender norms.⁶ These norms, if persisted over time, likely constrain women's ability to translate improvements in their outside options into actual decision-making authority and investments in children's education (Doss 2013), creating a downward bias in OLS estimates. Beyond gender norms, these regions may also differ systematically in school quality or local attitudes toward higher education. Furthermore, there can be confounding changes in local labor market conditions that alter both the opportunity costs of and perceived returns to higher education, which shape educational choices through pathways unrelated to intra-household bargaining dynamics. Notably, the direction of bias can be ambiguous: relative improvements in mothers' labor market conditions may signify higher returns to higher education (resulting in upward bias) or higher opportunity costs of university attendance (resulting in downward bias), depending on whether the increase in demand is for skilled or unskilled female workers.

To address these estimation challenges, I use a shift-share instrumental variable (IV) strategy that leverages exogenous shifts in labor demand specific to each spouse's demographic group. As has been used widely in the literature (Aizer 2010; Bertrand, Kamenica, and Pan 2015; Majlesi 2016; Shenhav 2021; Bergvall 2024), this approach builds on the notion that men and women often work in different industries, such that aggregate industry-level changes in labor demand differen-

⁶Appendix Figure 1 illustrates this relationship, showing a strong negative correlation between average annual changes in the median gender wage gap and the baseline gap in 1990 across provinces.

tially affect the earnings potential of each gender group depending on local industry compositions. The instrument is thus constructed as the interactions of these aggregate changes with a measure of each demographic group’s exposure, summed across industries, which generates variation in earnings potential that is independent of local confounding shocks.

Formally, I construct the following instrument for each spouse

$$(3) \quad \hat{w}_{aept}^g = \sum_k \gamma_{p,1990}^{g,k} \times w_{aet,-p}^{g,k}$$

where g indexes gender, a age, e education, p province, t year, and k industry. The shift component, $w_{aet,-p}^{g,k}$, is the average hourly wage in industry k in year t of workers of a given gender, age, and education group, measured at the national level excluding province p . The exposure share, $\gamma_{p,1990}^{g,k}$, is the portion of workers in gender group g in province p who were formal wage earners in industry k as of the base year 1990.⁷ I then estimate IV specifications of equation 2 in which both mother’s relative potential earnings and parents’ combined potential earnings are predicted by the constructed instruments for both spouses.

Recent studies have outlined the precise conditions under which a shift-share design can yield causal estimates, particularly by satisfying the exclusion restriction through either quasi-randomness of exposure shares (Goldsmith-Pinkham, Sorkin, and Swift 2020) or quasi-randomness of shocks (Borusyak, Hull, and Jaravel 2022). In Appendix Table 2, I report the Rotemberg weights obtained using the method outlined in Goldsmith-Pinkham, Sorkin, and Swift (2020), which reflect the contribution of each industry to the identification of mother’s relative potential earnings through the two instruments. These weights indicate that agriculture and mining are the two most influential industries driving my identification. As shown in the next section, my point estimates remain unchanged after removing each of these two industries from my measure of potential earnings and the construction of the instruments, suggesting that unobserved shocks correlated with changes in labor demand in these sectors are not driving my results. Furthermore, following the

⁷Note that this construction deviates slightly from the canonical Bartik setup, in that the exposure shares here account for both local industrial compositions (share of workers in an industry) and the relative size of the formal sector (share of workers in an industry that are formal wage earners).

prescriptions of these studies, I conduct a series of balance and falsification tests to assess the validity of my identification strategy. These tests examine the correlations between pre-determined household/individual characteristics and the predicted variation in mother's relative potential earnings and the extent to which mother's bargaining power, when measured before or after the point when enrollment decisions are finalized, can predict children's university enrollment. The results of these tests, also discussed in the subsequent section, provide strong evidence supporting the credibility of my empirical approach.

4 Results

4.1 Spouses' outside options and self-reported household decision-making

I begin my analysis by first assessing the impact of changes in women's outside options on their involvement in household decision-making in Indonesia. Establishing this first-order relationship is important, given that bargaining power is inherently unobservable and that women's relative potential earnings might influence household resource allocation through mechanisms unrelated to bargaining dynamics. Furthermore, evidence from other contexts indicates that improvements in outside options can enhance decision-making power in certain domains but not others, raising the possibility that children's educational outcomes may remain unaffected despite underlying shifts in mothers' decision-making authority.⁸

To measure spouses' involvement, I take advantage of the household decision-making module that was added to the IFLS starting with the second wave. Among married couples, the module asks both husbands and wives to separately identify household members who participate in decision-making across a number of domains.⁹ Using both wives' and husbands' responses, I construct

⁸For example, [Majlesi \(2016\)](#) analyzes similar household decision-making data from Mexico and finds no significant relationship between changes in women's relative labor market conditions and their decision-making power over children's education.

⁹These include decisions regarding food consumption; routine and large purchases; clothes (for self, spouse, and children); children's education, health; money given to family and spouse's family; gifts for parties or weddings;

binary outcomes that indicate whether the responding spouse is the only one making decisions in each domain and regress them on wife’s relative potential earnings measured in the same survey year. Taking advantage of the panel structure of the data, I include both district and household fixed effects, which account for unobserve local (time-invariant) characteristics as well as residential sorting across locations.¹⁰

Table 1 reports the estimated effects of wife’s relative potential earnings on household decision-making regarding children’s education. In columns 1-3, I focus on women’s responses as to whether they have sole authority. The OLS estimate in column 1 suggests that, holding household resources and other characteristics constant, a 10 percentage point increase in the wife’s relative potential earnings raises the probability that children’s education is decided solely by her by 1.5 percentage points. Though strongly statistically significant, this effect is modest given the outcome average (16 percent). However, there are reasons to believe that the OLS estimate is biased toward zero. For example, my measure of women’s relative potential earnings, which relies on local averages, may suffer from measurement error due to the relatively small cell sizes in SAKERNAS, leading to attenuation bias. Furthermore, as mentioned in the previous section, provinces that experienced stronger wage convergence during my study period tended to have larger initial gender gaps in 1990. If these larger gender gaps mask stronger traditional gender norms that persisted over time, OLS estimates could underestimate the true impact of an improvement in women’s outside options on their decision-making power. In line with these expectations, the IV estimate in column 2 is much larger in magnitude. The result suggests that an increase in the wife’s relative potential earnings by 10 points raises the probability of her deciding children’s education by 4.8 percentage points. This represents a 30 percent increase relative to the sample average and is significant at the 1 percent level.

In column 3, I interact wife’s relative potential earnings with working status. As mentioned

savings; labor supply; time use; and the use of contraception.

¹⁰Specifically, I estimate the following equation, $outcome_{i,t} = \beta \text{wife's rel. pot. earnings}_{i,t} + \Gamma X'_{i,t} + \gamma_d + \mu_i + \theta_t + \epsilon_{i,t}$, where t denotes survey year (1997, 2000, 2007, 2014), γ_d district fixed effects, μ_i household fixed effects, θ_t survey year fixed effects, and $X_{i,t}$ a vector of covariates including husband’s and wife’s age dummies and years of schooling, wife’s working status, (log) household earnings, and the number of children in the household.

earlier, bargaining theory predicts that outside options, rather than realized outcomes observed in equilibrium, determine bargaining power. This implies that improvements in relative potential earnings should increase involvement in household decision-making among both working and non-working women. The obtained results support this prediction. In particular, a 10 percentage point rise in women's relative potential earnings is associated with a 5.0-point increase in the probability of deciding children's education among non-working wives and a 4.5-point increase among working wives.

Turning to columns 4-6, I analyze husbands' responses as to whether they have authority over children's education. While OLS estimate (column 4) is not distinguishable from zero, corresponding IV estimates (columns 5 and 6) show a negative and significant effect of the wife's relative potential earnings on the likelihood of the husband deciding children's education. Notably, the point estimates are of similar magnitude compared to their counterparts in columns 2 and 3.

In Appendix Figure 2, I report the full set of estimates on wives' decision-making authority in each decision domain using their responses. The result pattern points to an overall increase in women's decision-making power, with particularly strong effects for decisions over private consumption (own clothes), how money is spent (money for savings and for own families), own labor supply, and children's welfare (education and health). In Appendix Figure 3, I repeat this analysis using husbands' self-reports of their own involvement in household decision-making. With the caveat that obtained estimates from analyzing husbands' responses are somewhat noisier, the results again indicate an overall reduction in husbands' decision-making power in response to increases in wives' relative potential earnings. Overall, the results discussed in this section are consistent with intra-household bargaining theories and suggest that improvements in women's outside options strengthen their decision-making authority over household investments in children.

4.2 Intra-Household Bargaining and Household Investments in Children's Higher education

Having established the empirical relationship between women's outside options and their decision-making authority, particularly over household investments in children's education, I now turn to the main results of my analysis. In Table 2, I report estimates of the effects of mother's relative potential earnings on children's university enrollment, obtained from estimating equation 3. The OLS estimate from column 1 suggests that, conditional on an extensive set of controls for individual and household characteristics as well as local labor market conditions, mothers' relative potential earnings has no significant effect on children's university enrollment. As discussed earlier, however, there are strong reasons to believe that OLS estimates are biased downward. Recall that the OLS results presented in the previous section underestimate the effects of women's relative potential earnings on their self-reported decision-making power. This could be explained by either the (classical) measurement error in my measure of earnings potential or unobserved local characteristics, such as more traditional gender norms or higher opportunity costs of attending postsecondary education, which, in turn, also negatively bias the relationship between mother's relative potential earnings and children's educational outcomes. The corresponding IV estimate in column 2, which is larger than its OLS counterpart, supports this notion. In particular, an increase in mother's relative earnings by 10 percentage points is associated with a 4.2 percentage point increase in the probability of children enrolling in a university. This effect is statistically significant at the 1 percent level, while also economically substantial. In particular, the proportion of high school graduates that went on to attend a university is 32 percent in my sample. An increase in mother's relative potential earnings by one standard deviation (13 percentage point) would thus lead to an increase in the likelihood of children pursuing higher education by 17 percent (5.3 percentage point).

In column 3, I assess whether the impact of a change in mother's bargaining power differ by the child's gender by interacting mother's relative potential earnings with indicators for sons and

daughters. The obtained estimates indicate significant and statistically indistinguishable effects on university enrollment for both sons and daughters (a test of equality yields a p -value of 0.88). This result is consistent with the graphical evidence presented earlier showing similar trends in university enrollment across gender, and also with the relative absence of a son preference in Indonesia (Kevane and Levine 2000). Importantly, this also suggests that my findings cannot be explained by mother's bargaining power picking up differential changes in the opportunity cost of or return to higher education by gender.

4.3 Validity of empirical approach

The results presented thus far are consistent with standard household bargaining theories: improvements in women's outside options strengthen their decision-making power and, in turn, increase household demand for and investment in children's higher education. Here, I explore the robustness of my core findings to alternative explanations.

To begin, I conduct a series of balance tests in which I regress household and individual characteristics on my (instrumented) measure of mother's relative potential earnings. If the constructed shift-share instruments successfully isolate exogenous changes in earnings potential specific to parents' demographic groups, one should expect mother's relative potential earnings not to predict pre-determined background characteristics. Indeed, the results presented in Table 3 indicate no significant correlation between my measure of mother's bargaining power and household resources (parents' earnings and household assets), individual demographic characteristics (being male, Javanese) and ability indicators (attending public schools, height, and cognitive test scores).¹¹ Since these factors are important determinants of university preparedness and the likelihood of pursuing higher education, the lack of correlation suggests that my findings cannot be explained by unobserved household and individual characteristics.

¹¹Cognitive test scores were only introduced in the latest wave of the IFLS and are not available for about a quarter of my sample. To increase sample size and avoid a "bad control" problem, I do not include these as controls in my regressions. Nonetheless, my results remain qualitatively similar when controlling for cognitive test scores.

Next, I examine the effects of mother’s relative potential earnings measured before and after the year of high school graduation (child aged 17). Assuming university enrollment decisions are finalized during this period for most individuals, one should expect no correlation between the distribution of mother’s bargaining power measured after the age of 17 and enrollment decisions. Similar to the logic behind “pre-trend” tests that are often conducted in empirical work, a significant correlation would signify the likely presence of unobserved confounders. By contrast, a significant effect of mothers’ decision-making power measured before the age of 17 on enrollment outcomes can have ambiguous implications. On the one hand, such effect can reflect perfect commitment between the two parents, or the underlying impact of a redistribution of household resources toward child-rearing activities that enhance academic performance as well as the likelihood of pursuing higher education. On the other hand, it can also reflect secular changes in the labor market leading to higher household demand for higher education. The results in Table 4 indicate that only mothers’ relative potential earnings measured in the year of individuals graduating from high school have a statistically and economically significant effect on university enrollment. Accordingly, these rule out confounding changes labor market conditions and differences in household and individual background characteristics as the drivers of my results. As a further check, I also repeat this analysis for senior high school completion, an educational outcome that has been shown to be sensitive to local labor market opportunities (Rees and Mocan 1997; Atkin 2016). Once again, the results presented in Appendix Table 3, which I obtain from analyzing a sample of individuals who have at least attended senior secondary school, indicate no significant impact of mother’s relative potential earnings.

Lastly, I assess whether my results are driven by confounding shocks in agriculture and mining, the two industries that are most influential in driving identification according to the Rotemberg weights reported in Appendix Table 2. In Appendix Table 4, I show that my results are not sensitive to the exclusion of each of these two industries in constructing potential earnings and my instruments. In particular, I obtained point estimates of 3.9 percentage points after removing agriculture and 3.8 percentage points after removing mining, with both estimates significant at the 5

percent level.

Given these results, the remaining threat to my empirical strategy comes from confounding household dynamics that take place also in the year individuals complete senior secondary school. One plausible alternative explanation is that changes in mothers' labor supply, driven by shifts in potential earnings, could explain the observed results. Although the IFLS does not provide comprehensive labor supply data to fully address this issue, I leverage retrospective employment history data to assess whether the impact of mothers' relative potential earnings varies by their employment status at age 17. The results, presented in Table 5, show that the significant effect of mothers' relative potential earnings can be observed for both employed and non-employed mothers during this critical period. These findings align with previous evidence on self-reported decision-making authority and reinforce the conclusion that shifts in bargaining power are the most plausible explanation for the relationship between mothers' relative potential earnings and children's university enrollment.

4.4 Implications for the role of credit constraints

As mentioned earlier, researchers often document a positive relationship between household resources and university enrollment across contexts, and have tended to attribute such a positive gradient to either short-term budget constraints, consumption/wealth effects, or unobserved long-term determinants of higher education preparedness. Given that mothers' decision-making power and, accordingly, the portion of household resources available for educational investments do not exhibit a significant impact on children's university enrollment when measured before children reach the age of 17, the results in this paper are more in line with either short-run binding financial constraints or a wealth effect.

To conclude my empirical analysis, I provide evidence of the relative importance of binding resource constraints. I first construct a measure of short-term resource constraints by residualizing parents' combined earnings on household assets, each parent's years of education and age dum-

mies, and district fixed effects. By construction, this measure of parental earnings is not related to factors typically associated with having better long-term resources and more educated parents, and is thus more likely to reflect short-term constraints than preferences for schooling. In Table 6, I examine whether the effect of mothers' decision-making power differs by this measure of resource constraints. As shown, mothers' control over household resources has the largest effect on children's enrollment among households in the top tercile of residualized parental earnings. The obtained point estimate indicates a 5.7 percentage point increase in the probability of enrollment in response to a 10 percentage point rise in mothers' relative potential earnings. The corresponding estimate for the lowest tercile is 1.8 percentage points and not statistically significant (a test of equality yields a p -value of 0.046, providing strong evidence against the null hypothesis). Together, the results in this paper suggest that short-term household resource constraints, from the view points of children, can limit their participation in higher education. Alleviating these constraints requires not only increasing parents' overall resources but, crucially, also ensuring that a greater share is controlled by the parent more committed to investing in children's educational attainment.

5 Conclusion

In this paper, I document evidence of the role of intra-household bargaining dynamics in determining children's higher education participation. By leveraging plausibly exogenous shifts in parents' relative labor conditions in the context of Indonesia, I demonstrate that improvements in women's outside options significantly enhance their decision-making authority, particularly regarding children's education. These shifts in bargaining power, when occurring as children graduate from high school, substantially increase the likelihood of university attendance for both sons and daughters, with effects most pronounced in households less likely to face binding short-term financial constraints. A key conceptual implication of these results is whether parental income and wealth translate into investments in children's higher education depends critically on the distri-

bution of intra-household bargaining power. This highlights a more nuanced view of the roles of short-run budget constraints in determining human capital accumulation, one that has often been overlooked in the literature: relaxing the budget constraint can increase household educational investments in children insofar as resources are controlled by the more altruistic parent in the family. As a result, policies aimed at narrowing the gender gap in the labor market can have important intergenerational implications for upward mobility, if not also economic development ([Doepke and Tertilt 2019](#)).

References

- Acemoglu, D., and J.S. Pischke. 2001. "Changes in the Wage Structure, Family Income, and children's Education." *European Economic Review* 45:890–904.
- Addoum, J.M. 2017. "Household Portfolio Choice and Retirement." *Review of Economics and Statistics* 99:870–883.
- Aizer, A. 2010. "The Gender Wage Gap and Domestic Violence." *American Economic Review* 100:1847–59.
- Alderman, H., P.A. Chiappori, L. Haddad, J. Hoddinott, and R. Kanbur. 1995. "Unitary Versus Collective Models of the Household: Is It Time to Shift the Burden of Proof?" *The World Bank Research Observer* 10:1–19.
- Alesina, A., S. Hohmann, S. Michalopoulos, and E. Papaioannou. 2021. "Intergenerational mobility in Africa." *Econometrica* 89:1–35.
- Anderson, S., and M. Eswaran. 2009. "What Determines Female Autonomy? Evidence from Bangladesh." *Journal of Development Economics* 90:179–191.
- Atkin, D. 2016. "Endogenous Skill Acquisition and Export Manufacturing in Mexico." *American Economic Review* 106:2046–85.
- Attanasio, O., T. Boneva, and C. Rauh. 2022. "Parental beliefs about returns to different types of investments in school children." *Journal of Human Resources* 57:1789–1825.
- Attanasio, O., S. Cattan, and C. Meghir. 2022. "Early childhood development, human capital, and poverty." *Annual Review of Economics* 14:853–892.
- Attanasio, O.P., and V. Lechene. 2014. "Efficient responses to targeted cash transfers." *Journal of political Economy* 122:178–222.
- Bastian, J., and K. Michelmore. 2018. "The Long-Term Impact of the Earned Income Tax Credit on Children's Education and Employment Outcomes." *Journal of Labor Economics* 36:1127–1163.
- Belley, P., and L. Lochner. 2007. "The Changing Role of Family Income and Ability in Determining Educational Achievement." *Journal of Human Capital* 1:37–89.
- Bergvall, S. 2024. "Women's economic empowerment and intimate partner violence." *Journal of Public Economics* 239:105211.
- Bertrand, M., E. Kamenica, and J. Pan. 2015. "Gender identity and relative income within households." *The Quarterly Journal of Economics* 130:571–614.
- Björklund, A., M. Lindahl, and E. Plug. 2006. "The Origins of Intergenerational Associations: Lessons from Swedish Adoption Data." *The Quarterly Journal of Economics* 121:999–1028.
- Björklund, A., and K.G. Salvanes. 2011. "Education and family background: Mechanisms and policies." In *Handbook of the Economics of Education*. Elsevier, vol. 3, pp. 201–247.

- Black, S.E., and P.J. Devereux. 2011. "Recent developments in intergenerational mobility." *Handbook of labor economics* 4:1487–1541.
- Bleakley, H., and J. Ferrie. 2016. "Shocking Behavior: Random Wealth in Antebellum Georgia and Human Capital across Generations." *The Quarterly Journal of Economics* 131:1455–1495.
- Borusyak, K., P. Hull, and X. Jaravel. 2022. "Quasi-experimental shift-share research designs." *The Review of economic studies* 89:181–213.
- Bound, J., M.F. Lovenheim, and S. Turner. 2010. "Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources." *American Economic Journal: Applied Economics* 2:129–57.
- Bulman, G., R. Fairlie, S. Goodman, and A. Isen. 2021. "Parental Resources and College Attendance: Evidence from Lottery Wins." *American Economic Review* 111:1201–40.
- Calvi, R. 2020. "Why are older women missing in India? The age profile of bargaining power and poverty." *Journal of Political Economy* 128:2453–2501.
- Cameron, S.V., and C. Taber. 2004. "Estimation of Educational Borrowing Constraints Using Returns to Schooling." *Journal of Political Economy* 112:132–182.
- Carneiro, P., and J.J. Heckman. 2002. "The Evidence on Credit Constraints in Post-Secondary Schooling." *The Economic Journal* 112:705–734.
- Case, A., and C. Paxson. 2008. "Stature and status: Height, ability, and labor market outcomes." *Journal of political Economy* 116:499–532.
- Coelli, M.B. 2011. "Parental Job Loss and the Education Enrollment of Youth." *Labour Economics* 18:25–35.
- Dizon-Ross, R., and S. Jayachandran. 2023. "Detecting mother-father differences in spending on children: A new approach using willingness-to-pay elicitation." *American Economic Review: Insights* 5:445–459.
- Doepke, M., and F. Kindermann. 2019. "Bargaining over babies: Theory, evidence, and policy implications." *American Economic Review* 109:3264–3306.
- Doepke, M., and M. Tertilt. 2019. "Does female empowerment promote economic development?" *Journal of Economic Growth* 24:309–343.
- Doss, C. 2013. "Intrahousehold bargaining and resource allocation in developing countries." *The World Bank Research Observer* 28:52–78.
- Duflo, E. 2003. "Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa." *The World Bank Economic Review* 17:1–25.
- . 2012. "Women empowerment and economic development." *Journal of Economic literature* 50:1051–1079.

- Goldsmith-Pinkham, P., I. Sorkin, and H. Swift. 2020. “Bartik instruments: What, when, why, and how.” *American Economic Review* 110:2586–2624.
- Heath, R., and A.M. Mobarak. 2015. “Manufacturing growth and the lives of Bangladeshi women.” *Journal of development Economics* 115:1–15.
- Kevane, M., and D.I. Levine. 2000. “The changing status of daughters in Indonesia.”, pp. .
- Light, A., and W. Strayer. 2000. “Determinants of College Completion: School Quality or Student Ability?” *Journal of Human Resources*, pp. 299–332.
- Lise, J., and K. Yamada. 2019. “Household sharing and commitment: Evidence from panel data on individual expenditures and time use.” *The Review of Economic Studies* 86:2184–2219.
- Løken, K.V. 2010. “Family Income and Children’s Education: Using the Norwegian Oil Boom as a Natural Experiment.” *Labour Economics* 17:118–129.
- Lovenheim, M.F. 2011. “The Effect of Liquid Housing Wealth on College Enrollment.” *Journal of Labor Economics* 29:741–771.
- Lundberg, S., and R.A. Pollak. 1993. “Separate Spheres Bargaining and the Marriage Market.” *Journal of Political Economy* 101:988–1010.
- Lundberg, S.J., R.A. Pollak, and T.J. Wales. 1997. “Do Husbands and Wives Pool Their Resources? Evidence from the United Kingdom Child Benefit.” *Journal of Human Resources*, pp. 463–480.
- Majlesi, K. 2016. “Labor Market Opportunities and Women’s Decision Making Power within Households.” *Journal of Development Economics* 119:34–47.
- Manoli, D., and N. Turner. 2018. “Cash-On-Hand and College Enrollment: Evidence from Population Tax Data and the Earned Income Tax Credit.” *American Economic Journal: Economic Policy* 10:242–71.
- Manser, M., and M. Brown. 1980. “Marriage and Household Decision-Making: A Bargaining Analysis.” *International Economic Review*, pp. 31–44.
- Mazzocco, M. 2007. “Household Intertemporal Behaviour: A Collective Characterization and a Test of Commitment.” *The Review of Economic Studies* 74:857–895.
- McElroy, M.B., and M.J. Horney. 1981. “Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand.” *International Economic Review*, pp. 333–349.
- Newhouse, D., and K. Beegle. 2006. “The Effect of School Type on Academic Achievement Evidence from Indonesia.” *Journal of Human Resources* 41:529–557.
- Oreopoulos, P., and K.G. Salvanes. 2011. “Priceless: The Nonpecuniary Benefits of Schooling.” *Journal of Economic Perspectives* 25(1):159–84.
- Pollak, R.A. 2005. “Bargaining Power in Marriage: Earnings, Wage Rates and Household Production.”

- Qian, N. 2008. "Missing Women and the Price of Tea in China: The Effect of Sex-Specific earnings on Sex Imbalance." *The Quarterly Journal of Economics* 123:1251–1285.
- Quisumbing, A.R., and J.A. Maluccio. 2003. "Resources at marriage and intrahousehold allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa." *Oxford Bulletin of Economics and Statistics* 65:283–327.
- Rees, D.I., and H.N. Mocan. 1997. "Labor Market Conditions and the High School Dropout Rate: Evidence from New York State." *Economics of Education Review* 16:103–109.
- Schaner, S. 2017. "The Cost of Convenience? Transaction Costs, Bargaining Power, and Savings Account Use in Kenya." *Journal of Human Resources* 52:919–945.
- Shavit, Y., and H.P. Blossfeld. 1993. *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Boulder, CO: Westview Press.
- Shenhav, N. 2021. "Lowering standards to wed? Spouse quality, marriage, and labor market responses to the gender wage gap." *Review of Economics and Statistics* 103:265–279.
- Thomas, D. 1990. "Intra-Household Resource Allocation: An Inferential Approach." *Journal of Human Resources*, pp. 635–664.
- Wang, H., and Z. Cheng. 2021. "Mama loves you: The gender wage gap and expenditure on children's education in China." *Journal of Economic Behavior & Organization* 188:1015–1034.
- Ward-Batts, J. 2008. "Out of the Wallet and Into The Purse Using Micro Data to Test Income Pooling." *Journal of Human Resources* 43:325–351.
- Zhao, C., and X. Qu. 2024. "Place-Based Policies, Rural Employment, and Intra-Household Resources Allocation: Evidence from China's Economic Zones." *Journal of Development Economics* 167:103210.

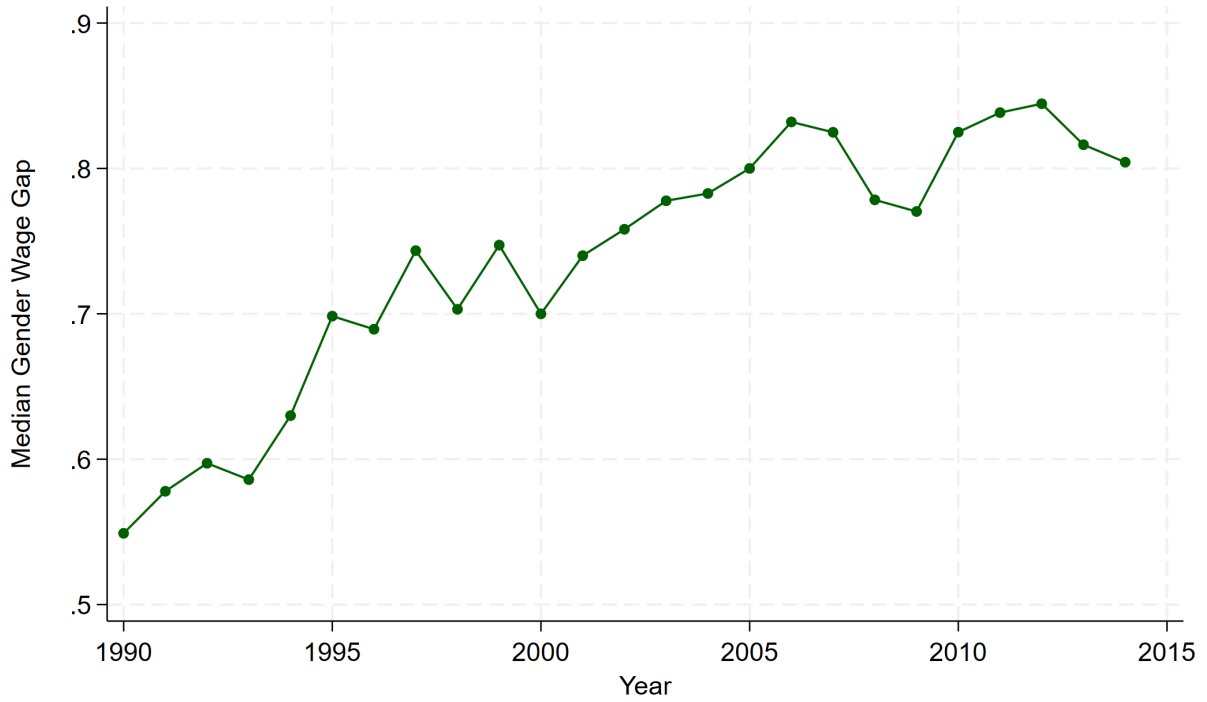


Figure 1—Gender Wage Gap in Indonesia, 1990-2014.

Notes—Author calculation based on 1990-2014 data from the Indonesian Labor Force Survey. Gender wage gap is calculated as the ratio of female-to-male median hourly. Sample is restricted to workers in the formal wage sector working at least 30 hours per week and between ages 15 and 55 in the survey year.

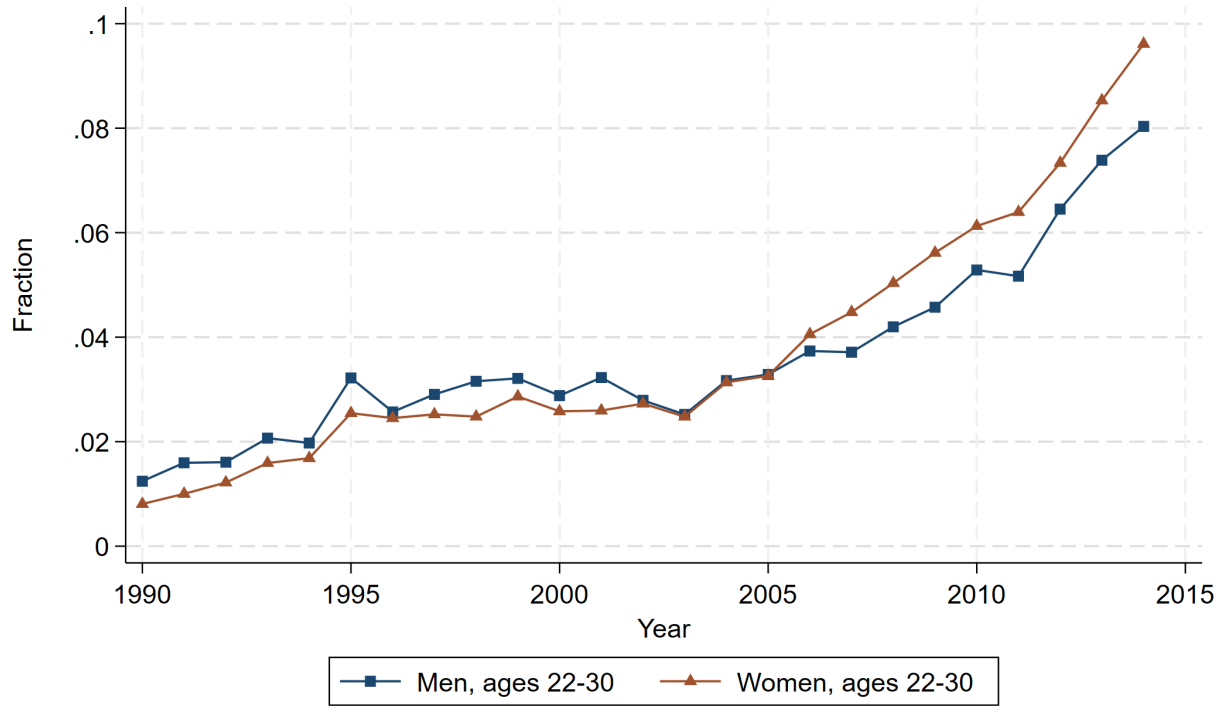


Figure 2—Fraction of Young Adults with a Bachelor's Degree or Above.



Figure 3—Mothers' Relative Potential Earnings by Cohort.

Table 1—Relative Labor Market Opportunities and Decision-Making Authority Over Children’s Education

	Wife Decides Children’s Education (Using Wife’s Response)			Husband Decides Children’s Education (Using Husband’s Response)		
	OLS (1)	IV (2)	IV (3)	OLS (4)	IV (5)	IV (6)
Effect of 10ppt increase in wife’s relative potential earnings	0.015*** (0.005)	0.048*** (0.018)		0.000 (0.005)	-0.044** (0.020)	
× Wife not working			0.050** (0.019)			-0.035* (0.020)
× Wife working			0.045** (0.020)			-0.053** (0.021)
Household FEs	Yes	Yes	Yes	Yes	Yes	Yes
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Survey year FEs	Yes	Yes	Yes	Yes	Yes	Yes
First-stage <i>F</i> -stat		245.9	123.0		218.6	109.4
Observation	21,494	21,494	21,494	19,560	19,560	19,560
Outcome mean	0.16	0.16	0.16	0.12	0.12	0.12

Notes—All specifications control for husband’s and wife’s age dummies and years of education, wife’s working status, (log) household earnings, and number of children. Standard errors clustered at the household level in parentheses. * significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.

Table 2—Mother’s Relative Potential Earnings and Children’s University Enrollment

	University Enrollment		
	OLS (1)	IV (2)	IV (3)
Effect of a-10ppt increase in mother’s pot. rel. earnings	0.013 (0.009)	0.042*** (0.016)	
× Male			0.044** (0.020)
× Female			0.041** (0.020)
Cohort FEs	Yes	Yes	Yes
District FEs	Yes	Yes	Yes
First-stage <i>F</i> -statistic		49.9	25.5
<i>p</i> -val (Male = Female)			0.88
Observation	4,385	4,385	4,385

Notes—Sample includes children aged 18-39 in IFLS-4 who have at least graduated from high school. All specifications control for sex, number of siblings, ethnicity, height, type of school attended at the primary, junior secondary, and senior secondary levels; father’s and mother’s age dummies and years of schooling; parents’ combined earnings and potential earnings; household assets; as well as the province-level unemployment rate among 18-24-year-olds, the share of working adults with a university degree, and the female labor force participation rate when individuals were 17. Mother’s potential relative earnings and parents’ potential earnings are instrumented in columns 2 and 3. Robust standard errors clustered at the district level in parentheses. * significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.

Table 3—Balance Tests

Characteristics	Obs	IV estimates	
		Coef.	SE
Log parents' earnings	4,385	0.092	(0.126)
Log household assets	4,385	0.402	(0.244)
Male	4,385	0.018	(0.022)
Javanese	4,385	-0.010	(0.016)
Attended public, non-religious senior secondary school	4,385	-0.018	(0.027)
Height (cm)	4,385	0.111	(0.364)
Cognitive test scores (z-score)	3,464	-0.012	(0.031)

Notes—This table reports IV estimates obtained from regressing background characteristics on predicted mother's relative potential earnings. All specifications control for predicted parents' potential earnings, father's and mother's age dummies and years of schooling, as well as district and cohort fixed effects. Robust standard errors clustered at the district level in parentheses.

Table 4—Effects of Mother’s Relative Potential Earnings at Different Child Ages

Effect of a-10ppt increase in mother’s pot. rel. earnings	University Enrollment	
	OLS (1)	IV (2)
When child aged 15	-0.004 (0.008)	0.005 (0.020)
When child aged 16	0.000 (0.009)	0.021 (0.021)
When child aged 17	0.013 (0.009)	0.042*** (0.016)
When child aged 18	-0.005 (0.009)	0.024 (0.018)
When child aged 19	-0.011 (0.009)	0.003 (0.016)
When child aged 20	-0.002 (0.009)	-0.004 (0.020)

Notes—This table presents results from estimating equation 3, with parents’ potential earnings measured at different child ages. Parents’ characteristics are held constant at the child’s age 17, while potential earnings are calculated using lagged and lead data from SAKERNAS for workers with comparable characteristics. A full set of covariates listed in table 3 is included. Robust standard errors, clustered at the district level, are shown in parentheses. * significant at the 0.1 level, ** significant at the 0.05 level, *** significant at the 0.01 level.

Table 5—Heterogeneity by Mother’s Working Status when Child Aged 17

	University Enrollment
Effect of a-10ppt increase in mother’s pot. rel. earnings	
× Mother not working when child aged 17	0.034* (0.017)
× Mother working when child aged 17	0.049*** (0.020)
Cohort FEs	Yes
District FEs	Yes
First-stage <i>F</i> -statistic	25.9
<i>p</i> -val (Mother not working = Mother working)	0.28
Observation	4,385

Notes—This table reports results obtained from an IV specification of equation 3 where both mother’s potential relative earnings and parents’ potential earnings are instrumented. A full set of covariates listed in table 2 and mother’s working status when child aged 17 are included. Robust standard errors clustered at the district level in parentheses. * significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.

Table 6—Heterogeneity by Household Resources

	University Enrollment
Effect of a-10ppt increase in mother's pot. rel. earnings	
× Residualized parents's earnings: Lowest tercile	0.018 (0.020)
× Residualized parents's earnings: Middle tercile	0.043** (0.019)
× Residualized parents's earnings: Top tercile	0.057*** (0.020)
Cohort FEs	Yes
District FEs	Yes
First-stage <i>F</i> -statistic	19.8
<i>p</i> -val (Lowest tercile = Top tercile)	0.046
Observation	4,385

Notes—This table reports results obtained from an IV specification of equation 3 where both mother's potential relative earnings and parents' potential earnings are instrumented. Residualized parents' earnings are obtained from a regression of parents' earnings on a quadratic of household assets, each parent's years of schooling and age dummies, and district fixed effects. A full set of covariates listed in table 2 and indicators for parents' earnings tercile are included. Robust standard errors clustered at the district level in parentheses. * significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.

Appendix Table 1—Summary Statistics of the Main Sample

Variables	Obs	Mean	SD
Enrolled in a university (IFLS-4)	4,385	0.32	0.47
Age	4,385	27.7	5.97
Male	4,385	0.49	0.50
Height (cm)	4,385	159.5	8.5
Javanese	4,385	0.43	0.49
Sundanese	4,385	0.10	0.30
Attended public, non-religious senior secondary school	4,385	0.49	0.50
Attended public, religious senior secondary school	4,385	0.04	0.20
Attended private, non-religious senior secondary school	4,385	0.27	0.44
Number of siblings	4,385	2.4	1.5
Mother's potential relative earnings	4,385	0.39	0.13
Father's years of schooling	4,385	8.6	4.3
Mother's years of schooling	4,385	7.4	4.1
Father's age (when child aged 17)	4,385	45.9	4.5
Mother's age (when child aged 17)	4,385	41.6	4.6
Parents' monthly earnings during adolescence (million 2014 Rupiah)	4,385	2.63	3.58
Household assets during adolescence (million, 2014 Rupiah)	4,385	150.1	319.9

Notes—Sample includes children aged 18-39 in IFLS-4 who have at least graduated from high school.

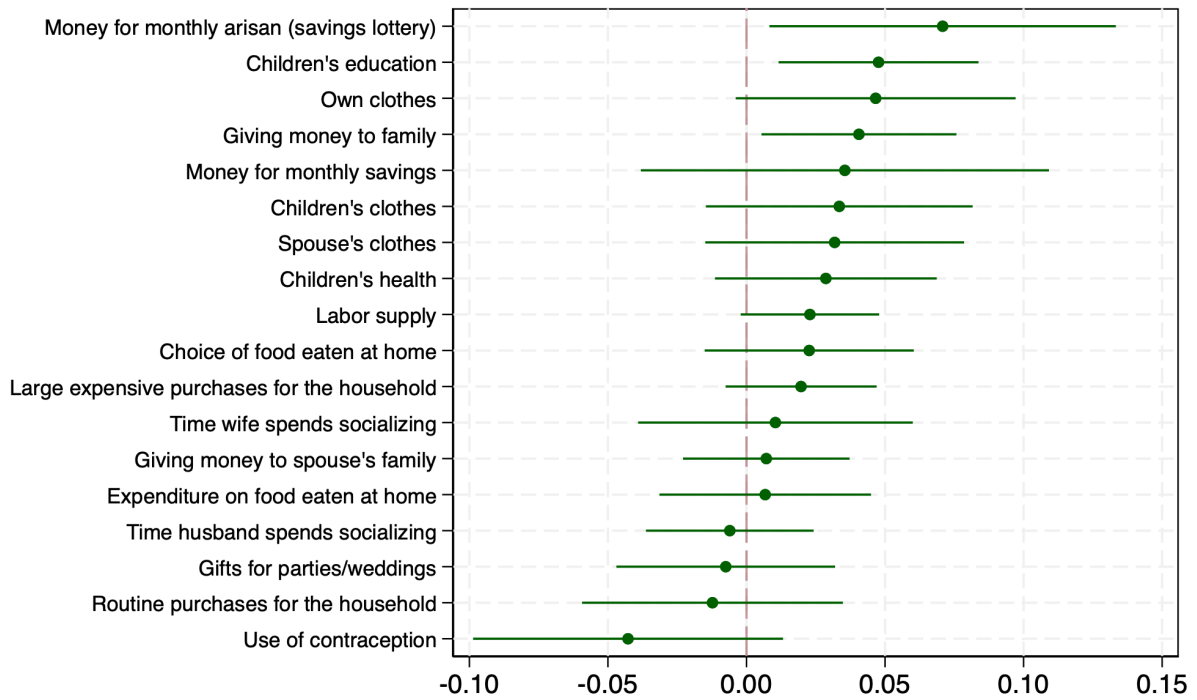
Appendix Table 2—Rotemberg Weights

Industry	Rotemberg weight	
	Women's potential earnings	Men's potential earnings
Agriculture	0.631	0.220
Mining	0.000	0.441
Manufacturing	0.119	0.066
Utilities	0.000	0.000
Construction	0.000	0.047
Wholesale and Retail	0.000	0.031
Transportation, Storage, and Communication	0.000	0.031
Finance, Real Estate, and Insurance	0.000	0.000
Services	0.250	0.163

Notes—This table reports the Rotemberg weights, obtained using the method outlined in Goldsmith-Pinkham, Sorkin, and Smith (2020). These weights quantify the contribution of each industry to the identification of mothers' potential relative earnings through the constructed shift-share instruments.

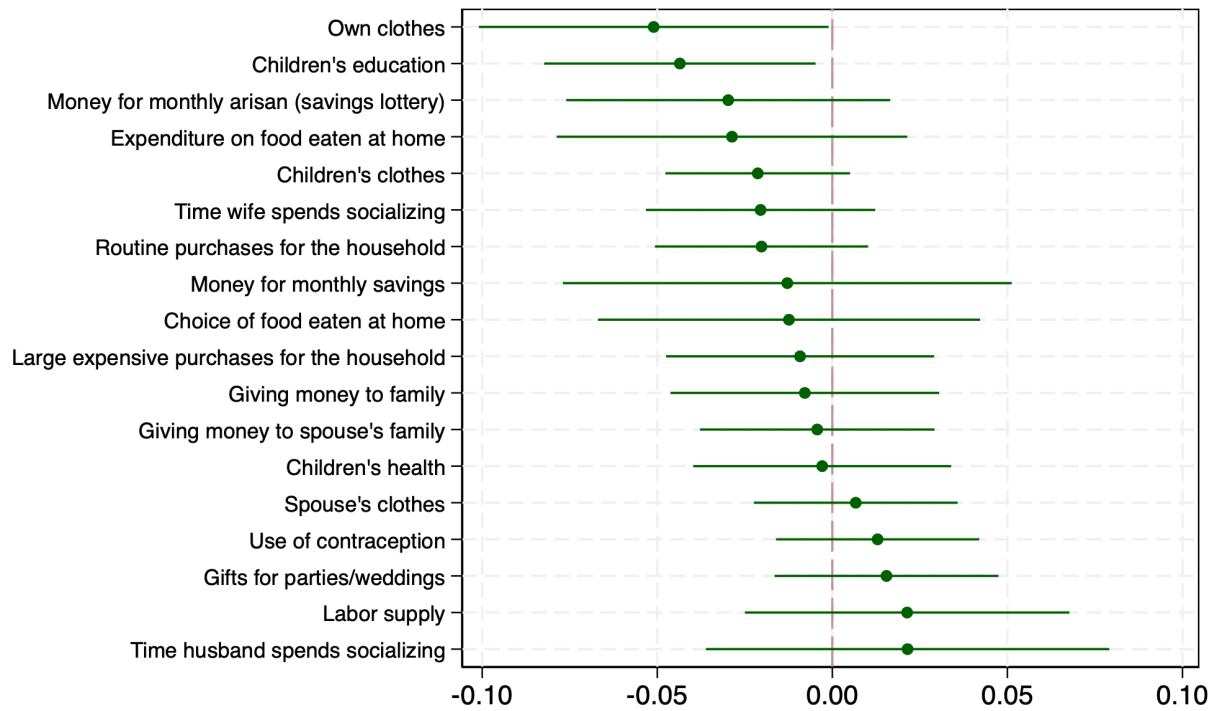


Appendix Figure 1—Correlation between Gender Wage Gap in 1990 and Average Annual Change (1990-2014) by Province.



Appendix Figure 2—Point Estimates of Effects of a 10ppt-Increase in Wife's Relative Earnings on Wife's Self-Reported Decision-Making Authority

Notes—Points estimates obtained from separate specifications similar to column 2 of table 1 where outcome variables indicate whether a decision is made solely by the wife.



Appendix Figure 3—Point Estimates of Effects of a 10ppts Increase in Wife's Relative Earnings on Husband's Self-Reported Decision-Making Authority

Notes—Points estimates obtained from separate specifications similar to column 2 of table 1 where outcome variables indicate whether a decision is made solely by the husband.

Appendix Table 3—Effects of Mother’s Relative Potential Earnings at Different Child Ages

Effect of a-10ppt increase in mother’s pot. rel. earnings	Completed Senior High School	
	OLS (1)	IV (2)
When child aged 15	0.006 (0.003)	0.017 (0.012)
When child aged 16	-0.002 (0.004)	0.004 (0.009)
When child aged 17	0.002 (0.004)	0.007 (0.009)
When child aged 18	-0.001 (0.004)	0.010 (0.011)
When child aged 19	0.005 (0.004)	0.007 (0.007)
When child aged 20	0.001 (0.005)	-0.001 (0.008)

Notes—This table presents regression results from estimating equation 3, with parents’ potential earnings measured at different child ages. Sample includes all individuals aged 18-39 in IFLS-4 who have at least attended senior secondary school. Parents’ characteristics are held constant at the child’s age 17, while potential earnings are calculated using lagged and lead data from SAKERNAS for workers with comparable characteristics. A full set of covariates listed in table 2 is included. Robust standard errors, clustered at the district level, are shown in parentheses. * significant at the 0.1 level, ** significant at the 0.05 level, *** significant at the 0.01 level.

Appendix Table 4—Robustness of Main Results to Alternative Specifications

	University Enrollment		
	OLS (1)	IV (2)	IV (3)
Panel A. Exclude Agriculture			
Effect of a-10ppt increase in mother's pot. rel. earnings	0.011 (0.008)	0.039** (0.015)	
× Female			0.042** (0.019)
× Male			0.035* (0.020)
First-stage F-statistic		33.8	16.9
Observation	4,268	4,268	4,268
Panel B. Exclude Mining			
Effect of a-10ppt increase in mother's pot. rel. earnings	0.013 (0.009)	0.038** (0.015)	
Male			0.041** (0.019)
Female			0.036* (0.020)
First-stage <i>F</i> -statistic		46.2	23.4
Observation	4,382	4,382	4,382

Notes—This table presents estimates obtained from repeating the analysis in Table 2 with the most influential sectors (reported in Appendix Table 2) excluded from the construction of mother's potential relative earnings and the shift-share instruments. * significant at 0.1 level, ** significant at 0.05 level, *** significant at 0.01 level.