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The effect of labour demand on women's intra-household decision power: Evidence from Indonesia

Sarah Xue Dong

Abstract: This study contributes to the literature on household decisions and women's empowerment by looking at the relationship between labour market opportunities and women's intra-household decision power in Indonesia. Using Bartik labour demand measures, I estimate the effect of change in local labour demand for women in large and medium manufacturing on women's intra-household decision power. Household decision power is calculated using direct information on who makes decisions in the household. I find that increase in labour demand for women in large and medium manufacturing increases women's intra-household decision power by a large magnitude. Increase in labour demand for men decreases women's household decision power. Consistent with intra-household bargaining theories, increase in labour demand for women increases women's decision power even for women who do not work. Based on new literature discussing the validity of Bartik instruments, I discuss the validity of my identification strategy and conduct robustness tests.

Keywords: intra-household decisions, women's empowerment, labour demand; large and medium manufacturing; shift-share (Bartik) instrument

JEL Codes: D10, J23, O14

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1. Introduction

The conceptual framework of household decision-making utilizes the concept of household members' relative bargaining power, which governs whose preference is more reflected in household allocations. Although it is a central concept in household decision models, bargaining power is poorly understood empirically since it is difficult to observe and measure.[1] From a development point of view, intra-household bargaining power is also important to understand since it is highly related to women's empowerment. Women's empowerment is a development goal itself and can also lead to better development outcomes such as better health and education of children.[2]

This paper utilizes unique information from the Indonesian Family Life Survey (IFLS) on intra-household decision making to measure women's intra-household decision power, and seeks to understand whether and by how much women's decision power is affected by their labour market opportunities relative to men's. The IFLS elicits longitudinal information on who makes decision in the household on 17 decision categories including expenditure on private goods, expenditure on public goods including children, financial decisions, and time allocation decisions. These information make it possible to construct more direct proxies of women's intra-household bargaining power than the ones more often

[1] For a literature review on bargaining models, and the empirical tests of these models, refer to Chiappori and Mazzocco (2017). For literature reviews about empirical research on women's intra-household bargaining power, especially in developing countries, refer to Doss (2013) and Bland and Ziparo (2017).

[2] For a literature review on women's empowerment and development, refer to Duflo (2012).

used in the literature.[3] Using longitudinal information on most of the household decisions, this study constructs measures of the change in women's overall decision power over time and the change in women's power for each decision.

Although bargaining theories predict that labour market opportunity is one of the most important determinants of women's intra-household bargaining power that directly affects women's outside options when marriage breaks down, limited empirical evidence exist to support this prediction.[4] Most empirical studies on intra-household bargaining focus on the effect of policy shocks such as cash transfer policy (Lundberg et al. 1997; Duflo 2003; Bobonis 2011; Doepke and Tertilt 2014), tax policy (Selin 2014) and family law (Chiappori et al. 2002; Ambrus et al. 2010; Veona 2015). There is, however, a growing literature, on the effect of labour opportunities on women. Qian (2008) looks at the effect of change in tea price after the Mao reforms in China on sex-differential survival of children. Heath (2015) looks at the effect of manufacturing expansion in Bangladesh on marriage, fertility, and education outcomes of women. Majlesi (2016) looks at the effect of gender-specific labour demand on women's intra-household bargaining power in Mexico. Several recent papers including Schaller (2016), Autor et al. (2019) and Shenhav (Forthcoming) analyse the effect of increasing labour market opportunities of women relative to men in US on marriage and fertility outcomes.

This paper follows this literature and constructs arguably exogenous measures of change in local labour demand for men and women in Indonesia and estimate their effect on

[3] Refer to Doss (2013) about other proxies of women's bargaining power such as income and assets. Anderson and Eswaran (2009), Antman (2014) and Majlesi (2016) also use similar information as the ones I use to construct proxies of women's intra-household bargaining power.

[4] Refer to Manser and Brown (1980), McElroy and Horney (1981), Lundberg (1993), Mazzocco (2007) about the different scenarios of outside options in the bargaining framework.

the intra-household decision measures. The majority of the labour force in Indonesia is employed in the service sector and the agriculture sector, followed by the manufacturing sector. Productivity and wage is much higher in the manufacturing sector than the service sector and the agriculture sector. With mostly small informal businesses, the service sector acts as a fall-back option when jobs are not available in the manufacturing sector, especially for individuals without post-secondary education. Therefore, change in employment in manufacturing, especially of production workers, is mostly driven by change in labour demand, instead of change in labour supply. Also, job opportunities in the manufacturing sector are much higher valued than job opportunities in other sectors for people with lower education levels.[5]

In this context, this paper follows Bartik (1991), Blanchard and Katz (1992) and Bound and Holzer (2003) and constructs gender-specific measures of change in labour demand in large and medium manufacturing at the local labour market level (district level).[6] This measure is the weighted average of growth in national employment of production workers in each manufacturing industry of men or women, where the weights are the district's industry composition of production workers of men or women. I use the Indonesian census of large and medium manufacturing to calculate the employment growth at the national level and the local composition of large and medium manufacturing. I use the Indonesian population census to account for the size of the local large and medium manufacturing industry relative to local employment.

The identification of this paper either comes from the exogeneity of local industry composition (Goldsmith-Pinkham et al. 2020) or from the exogeneity of the industry

[5] For a general discussion of labor market conditions in Indonesia, refer to Dong and Manning (2016).

[6] There are about 320 districts in Indonesia in 2000, the baseline of the period I study.

employment growth at the national level (Borusyak et al. 2020). Based on (Borusyak et al. 2020), I argue that by leaving the specific district out when calculating employment growth at the national level (Leave-One-Out instrument), I am mostly relying on exogeneity of industry employment growth for men and women for identification in this paper. I also show evidence, however, that the local industry composition may be exogenous in my setting, too, as my estimates are robust to a rich set of district level controls.

This paper is similar to Majlesi (2016), which uses similar household decision information from the Mexican Family Live Survey and looks at the effect of demand for men and women in manufacturing at the local labour market on women's decision power. Besides using traditional Bartik labour demand measures similar to my paper, Majlesi (2016) also uses the China export increase shock similar to Autor (2013) to construct an alternative measure of labour demand. I argue that in the setting of Majlesi (2016), if the identification comes from exogeneity of industry shocks, then the China shock alone will not be able to identify the effect of male and female labour demand separately. Furthermore, instead of change of national employment by industry when calculating the traditional Bartik labour demand measure, change of gender-specific national employment by industry should be used to calculate the change in gender-specific local demand. In this way shocks that affect the demand for men relative to women within industries, such as technology change, can be captured and utilized to identify the effect of change in demand for women relative to men at the local labour market level. This paper also discusses more seriously about the identification of the paper based on recent literature on validity of Bartik-type instruments, and conducts robustness tests based on this literature.

I find that for women with less than tertiary education, increase in demand for women in production work of large and medium manufacturing relative to that for men at the district level increases women's overall household decision power. This is especially true for the

decision categories regarding children according to husbands' response. Increase in demand for women is associated with increase in their employment, while increase in demand for men is associated with a decrease in women's employment. Consistent with bargaining theories, increase in labour demand for women relative to men increases women's decision power for women who do not work. These results are robust to district level controls, province fixed effects, and controls of local employment composition of large and medium manufacturing at the 2-digit industry level, showing that local industry composition could be exogenous in this setting. These results are also robust to excluding districts with high industry concentration, showing industry concentration may not be a problem to challenge the validity of the exogenous industry shocks interpretation. Pre-trend analysis reveals that the Bartik labour demand measures are related to change in decision power in the previous period, falling the pre-trend test. This result can be driven, however, by the fact that employment change by industry is serially correlated over time, which does not directly violate the identification assumptions.

The rest of the paper is constructed as following: section 2 discusses the Indonesian context in terms of the manufacturing sector and women's position in the household. Section 3 discusses the data and the empirical strategy. Section 4 discusses results. Section 5 concludes.

2. The Indonesian context

2.1: The manufacturing sector

Fast and broad-based manufacturing growth was the main engine of growth, job creation, and living standard improvement for Indonesia in the 1980s and early 1990s (Hill 2000). This trend was broaken by the Asian Financial Crisis. During the ensung years manufacturing has been stagnating, and employment has mostly shifted from agriculture to

services (Graph 1). Nevertheless, the Indonesian government and international organizations such as World Bank are still trying to boost manufacturing growth in Indonesia due to its positive influence on technology, employment, and poverty reduction (World Bank 2012a; World Bank 2012b; Gobel 2014).

[Figure 1]

Although a small sector in terms of employment, productivity and wage is much higher in manufacturing than agriculture and services. Table 1 shows that in 2014, among salaried workers without tertiary education, wage in manufacturing is much higher than all other sectors except for mining, which is a small sector in terms of employment. This is particularly true for women.

[Table 1]

In terms of composition of large and medium manufacturing across districts and across industries, we can see from Table 2 that most districts have a very small percentage of total employment in large and medium manufacturing. On average a district specializes in 18-22 industries, depending whether it is male or female employment. Across industries, on average employment in one industry is distributed across 20-21 districts. The mean concentration across districts of an industry is on average 0.14-0.16, and the maximum concentration of an industry is on average .4-.48. This shows relatively large industry concentration at the 5-digit industry level.

[Table 2]

[Table 3]

2.2: Women's position in the household and in society in general

Women in Indonesia, especially on Java, have relatively high autonomy compared with other Muslim majority countries. It is Javanese tradition for women to own small businesses and trade in the market. Anthropological evidence also suggests that Javanese women are the `mangers of household life' (Geertz 1961; Frankenberg 2001). Nevertheless, regional heterogeneity, resulting from ethnic, cultural, geographic and economic differences, is a defining feature of Indonesian society. Cultural norms vary significantly across ethnicities in Indonesia. For example, while most Javanese are bilineal, the Batak in north Sumatra are patrilineal, and the Minangkabou in west Sumatra are matrilineal.

In 2007 the mean age at first marriage is 24 for men and 21 for women (UN 2012). Divorce is relatively rare. Labour force participation of women is around 50-60 percent. Men tend to have higher education than women, but there is a converging trend for recent cohorts.

Amid this context, there would be substantial variation in women's decision making power across households, and the variation is likely to be driven by geographic location and ethnicity, in addition to economic variables and demographic variables. As 50-60% of women work in Indonesia, labour market opportunities will be relevant for many women. The fact that most Indonesians are married early and not likely to get divorced makes looking at change in decision power within marriage important, and this is what I concentrate on in this paper.

3. Data and empirical strategy

3.1: Data

This paper draws on three sources of data: The Indonesian Family Life Survey (IFLS), the Indonesian Large and Medium Manufacturing Census (Statistik Industri in Indonesian), and the 2000 population census of Indonesia.

I use data from the IFLS to construct the measure of women's intra-household decision making power, and also for information about household and individual characteristics. The Indonesian Family Life Survey is a large-scale longitudinal household survey spanning from 1993 to 2014, conducted by RAND in collaboration with Survey Meter in Indonesia. There have been six rounds in 1993, 1997, 1998, 2000, 2007 and 2014. At baseline in 1993 around 7000 households were interviewed. The attrition of IFLS is remarkably low.

Starting in 1997, a household decision module was added to the questionnaire. For 17 decision categories, the respondent reports who make decision in each category. Reporting single or multiple decision makers are both allowed. Both the wife and the husband answer same set of questions so that their response can be compared. The 17 categories can be broadly categorized into five groups: (1) expenditure on household public goods including food eaten at home, routine purchase, children's clothes, children's education and children's health, (2) expenditure on private goods including husbands' clothes, wives' clothes, time husband spends socializing and time wife spends socializing, (3) financial decisions including expenditure on durables, savings, transfers to wife's family, transfer to husband's family, arisan (rotated saving), and gifts to parties and weddings, (4) whether husband/wife works, (5) whether husband/wife uses contraception. I utilize these information to construct measures of women's intra-household decision power.

I use the Indonesian Large and Medium Manufacturing Census to construct measures of change in employment by industry over time and also the industry composition of employment for each district. The Large and Medium Manufacturing Census is an annual national census of all manufacturing plants that have 20 employees or more, conducted by the Indonesian government since the 1980s. For most years of the manufacturing census we can

obtain the industry code for a plant at the 5-digit industry level, so I look at the change in industry employment and the local industry composition at the 5-digit industry level.

I look at the effect of the change in labour demand calculated using the 2001 manufacturing census and the 2007 manufacturing census on the change in decision power calculated from the 2000 IFLS and the 2007 IFLS. This choice of years is due to the fact that industry code is more consistent for the period between 2000 and 2007. I use 2001 manufacturing census instead of 2000 manufacturing census because many plants in 2000 manufacturing census are missing 5-digit level industry code.

I use the 2000 population census to calculate the number of men and women employed in each district and other district characteristics at the baseline such as women's employment rate and women's education composition.

3.2: Measuring decision-making power

It is not clear how to construct measures of decision-making power within the household from the decision module in the Indonesian Family Life Survey. Therefore, I first describe the decision patterns. There are 17 decision categories in the household decision module, but for some categories the non-response rate is high due the fact that the household reports not making these decisions. These categories are (1) giving money to wife's family, (2) giving money to husband's family, (3) money for monthly arisan (rotating savings), (4) money for monthly savings, and 5. whether use contraception. For constructing measures of wife's decision power, I exclude these categories and also restrict the sample to couples with children. As a result, the analysis is based on 12 decision categories. The decision patterns of these categories are described in Table 4.

As shown in Table 4, for most households and decision categories decision-making can be categorized into four patterns: wife makes sole decision, wife and husband make joint decision, husband makes sole decision, and other (when other household members

participate). Wife tends to make sole decision in food and routine purchases, while the rest of the decisions are most likely to be made jointly between husband and wife. Relative to other decision categories, husband is more likely to make sole decision in his clothes, the time he spends socializing, and whether the husband/wife works.

The most direct way to assess how the decision power of wife changed over time is to see whether her power has improved or declined from the baseline in 2000. This is straightforward if assessed by each decision category. I define improving as either (1) from joint decision making (either with husband or other household members) to sole decision making, or (2) from not participating in decision making at all to joint or sole decision making. I define declining as either (1) from sole decision making to joint decision making or not participating at all, or (2) from joint decision making to not participating at all. Table 4 shows the percent of couples in which wife's power has improved/declined between 2000 and 2007. First thing to notice is that wife's power does change between the two years for most categories. On average, wives' decision power improved for expenditure on husband's clothes, expenditure on children's education, large purchases, time husband socializing, and whether husband/wife works. Wives' decision power on average declined for other categories.

[Table 4]

For the outcome variables in my analysis, I will mainly use (1) the number of categories in which wife's power improved, and (2) the number of categories in which wife's power declined. I will also analyse the effect on each decision category. In this case, the outcome variables are indicator variables indicating if the wife's decision power had improved for the category or declined for the category.

3.3: Estimated equation

The following equation is used to estimate the effect of change in gender-specific local labour demand in large and medium manufacturing on change in women's intra-household decision power:

$$\Delta P_{i,d} = \alpha_f \sum_1^N s_{n,f,d} g_{n,f,-d} + \alpha_m \sum_1^N s_{n,m,d} g_{n,m,-d} + \beta_f S_{f,d} + \beta_m S_{m,d} + \gamma X_i + \lambda Z_d + \Delta v_d + \Delta \varepsilon_{i,d} \quad (1)$$

where $\Delta P_{i,d}$ is the change in decision power for couple i in district d. $\sum_1^N s_{n,f,d} g_{n,f,-d}$ and $\sum_1^N s_{n,m,d} g_{n,m,-d}$ are measures of gender-specific change in local labour demand for production workers in large and medium manufacturing. $s_{n,f,d}(s_{n,m,d})$ is the share of female/male production workers in manufacturing industry n in total female(male) employment in district d at baseline. $g_{n,f,-d}(g_{n,m,-d})$ is the growth rate of female(male) employment of production workers in industry *n* at the national level, calculated excluding district d. $S_{f,d}(S_{m,d})$ is the share of women(men) employed as production workers in large and medium manufacturing among all women(men) who are employed in district d. X_i are couple level controls at the baseline, which include age and education level of the husband and of the wife, ethnic group of the wife,[7] whether the couple reside in urban or rural area, and the per capita consumption of the household. Z_d are district level controls at the baseline. Δv_d are unobserved district level changes that affect women's intra-household decision power. $\Delta \varepsilon_{i,d}$ is the couple level error term, and is identically and independently distributed. . I restrict the estimation to couples where wife has less than tertiary education as the labour demand for production workers mainly apply to this group. Since the labour demand measures are calculated at the district level, I cluster standard errors at the district level.

[7] Majority of couples are from the same ethnic group.

3.4 Identification

For α_f and α_m to be consistent estimates, we need $\sum_1^N s_{n,f,d} g_{n,f,-d}$ and $\sum_1^N s_{n,m,d} g_{n,m,-d}$ to be uncorrelated with Δv_d, the unobserved changes at the district level that affect the change in women's intra-household decision power. These changes can include labour market opportunity changes not captured by $\sum_1^N s_{n,f,d} g_{n,f,-d}$ and $\sum_1^N s_{n,m,d} g_{n,m,-d}$, change in marriage market conditions such as the ratio of men to women in different age and education groups, change in culture and social norm, etc..

The consistency condition can be satisfied in two ways. The first is that $s_{n,f,d}$ and $s_{n,m,d}$ are not correlated with Δv_d, thus following an exogenous shares approach discussed in Goldsmith-Pinkham et al. (2020). The second is that $g_{n,f,-d}$ and $g_{n,f,-d}$ are as good as random shocks, following the approach discussed in Borusyak et al. (2020).

Borusyak et al. (2020) discusses the validity of canonical Bartik labour demand measures similar to the ones used in my paper. It discusses how identification can come from the exogeneity of industry level employment growth. It argues that one can view industry employment growth rates as noisy estimates of as-good-as-random labour demand shocks. If labour supply shocks are not spatially correlated, then the employment growth rates can be exogenous proxies of labour demand if one leaves the local labour market out when calculating the growth rates (Leave-One-Out instruments). This paper adopts this view and argues that the identification of the paper mainly comes from the assumption that the national employment growth rate is an estimate of industry labour demand shocks which are as good as randomly assigned and driven by industry policy, trade policy, demographic change, international competition, etc.. The fact that the large and medium manufacturing in Indonesia faces an abundant labour supply implies that the employment growth rate, especially of production workers, may be predominantly driven by change in labour demand, as labour supply can be inelastic. I still use the leave-one-out strategy because industry

concentration is fairly high in Indonesia at the 5-digit industry level. Leaving the current district out guards against the case when the change in labour supply in a district with high industry concentration drives employment change of the industry at the national level.

Borusyak et al. (2020) also discusses the incomplete shares problem when the sum of the shares in the Bartik instrument, in my case $s_{n,f,d}$ and $s_{n,m,d}$ across n, does not equal to 1. In this case the remaining share, in my case, the percent of the workforce not employed as production workers in large and medium manufacturing, may influence the change in outcome. Borusyak et al. (2020) shows that this problem can be solved by controlling for the share of the rest of industries, and this is why I control for $S_{f,d}\ and\ S_{m,d}$.

Borusyak et al. (2020) also illustrates that the shock level exogeneity interpretation of Bartik instruments means that the regression coefficients are equivalently obtained from a transformed shock level (industry level in my case) regression. Extending from this result, it can be shown that if I want to identify α_f and α_m separately, I will need gender specific industry level shocks, instead of the shocks used in Majelesi (2016). That is why I use gender-specific national industry employment growth rates $g_{n,f,-d}$ and $g_{n,m,-d}$. I am assuming that gender-specific national employment industry growth rates are not perfectly correlated across industries and the variation comes from technology changes that alter the demand for men versus women in an industry.[8] This approach is also taken by Schaller (2016) that uses gender specific industry and occupation employment change to construct change in gender-specific local labour market demand, and by Shenhav (Forthcoming) that uses change in gender relative wage at the industry level to identify the effect of relative wage on marriage outcomes.

[8] The correlation between male and female employment growth (2001-2007) across industries at the national level is 0.80.

Besides the shocks as good as randomly allocated condition, Borusyak et al. (2020) shows that the second condition for consistent estimates from Bartik instruments taking a shock exogeneity approach is that the exposure to industry shocks is small on average across locations. I have shown in section 2.1 that industry concentration in Indonesia is relatively high at the 5-digit industry level. Therefore as a robustness check I exclude districts with high industry concentration to run my estimations.

The exogenous shares view on identification of Bartik instruments as discussed in Goldsmith-Pinkham et al. (2020) is more difficult to argue for in the setting of this paper. Local industry composition can be correlated with the level of economic development, the geographic location, and the composition of skill and education levels of local labour force, all of which can influence the change in women's position in society and in the household through other channels beyond change in labour demand. Nevertheless, I introduce a set of district level controls to assess the extent of this omitted variable problem. First I introduce controls of GDP, distance to province capital and national capital,[9] female employment rate, and education composition of women of the district at the baseline. These are the confounding characteristics that can be both related to the industry composition and the change in women's status in the society. Then I introduce province fixed effect. As province is a good indicator of ethnic composition and economic development in Indonesia, province fixed effects control for the possibility that different ethnic groups and locations with different level of development have different trajectories in women's position. Last I introduce controls of the local large and medium manufacturing industry composition at the 2-digit industry level, assuming that once big industry group composition is controlled for,

[9] as measures of its remoteness.

the composition within industry groups are more likely to be random and less correlated with district characteristics, as suggested by Goldsmith-Pinkham et al. (2020).

Both Borusyak et al. (2020) and Goldsmith-Pinkham et al. (2020) suggest conducting pre-trend analysis as an indirect test of the exogeneity assumptions. Therefore I also conduct the pre-trend test by regressing change of decision power between the 1997 and 2000 rounds of the Indonesian Family Life Survey on the change in labour demand measures between 2000 and 2007. It should be noted, however, that if industry shocks are correlated over time, changes in outcomes in previous periods may be related to shocks in later periods. This is not a direct violation of the exogenous shocks assumption in Borusyak et al. (2020).

4. Results

4.1: Summary statistics

The summary statistics of the main variables for the full sample and for the sample excluding high industry concentration districts (districts with a maximum concentration of any 5-digit industry higher than 50 percent) are given in Table 5. Characteristics of the couples are shown at the couple level, and characteristics of the districts are shown at the district level.

Based on the full sample, on average 2.7 out of 12 decision categories saw an improvement in women's decision power between 2000 and 2007. This is the case both according to wife and according to husband. On average 2.69-2.79 categories saw a decline in women's decision power between 2000 and 2007, depending on whether wife or husband is reporting. In 2000 58 percent of wives in my sample were working, and 19 percent of wives started working between 2000 and 2007. 16 percent of wives stopped working. Among wives with less than post-secondary education, which is the restriction of my sample, majority of wives have some primary education or less. The same is true for husbands, while

the husbands' education are slightly higher than wives. The summary statistics of the sample restricted to low industry concentration districts are similar with the ones of the full sample.

At the district level, according to the full sample, the average change in labour demand in large and medium manufacturing for women between 2000 and 2007 is -0.7 percent, and the average change for men is -0.5 percent. These changes are small, and probably caused by the fact that on average only 5(3) percent of female(male) employment is in large and medium manufacturing in a district. Both of these demand changes are negative, though, reflecting the general trend of declining large and medium manufacturing during this period. In terms of baseline characteristics of districts in my sample (districts that are covered by the Indonesian Family Life Survey), the mean distance to the provincial capital is 83 kilometres and the mean distance to national capital is 677 kilometres. Mean population is 0.86 million, and mean non-oil GDP per capita is about 15 million rupiah (about USD1500) in 2000. Female employment rate across districts is on average 58 percent. Education level among women on average is low in 2000.

The districts with low industry concentration have smaller share of employment in large and medium manufacturing, and have smaller decline in labour demand in large and medium manufacturing. They are more remotely located, have smaller population, and lower GDP. The female employment rate and education level are similar for low industry concentration districts.

[Table 5]

4.2: Main results

Table 6-9 summarize the regression results in this paper. As discussed in section 3.2, I measure the change in women's decision power by looking at the number of categories in which women's power improved or declined. I also look at power improvement or decline by

category. I distinguish between wives' reports and husbands' reports and calculate the outcomes according to the wife and again according to the husband. Regression results on these outcomes in general consistently show a pattern of improved decision power for women with increase in demand for female labour in large and medium manufacturing, and decreased decision power with increase in demand for male labour. The effect on the number of categories that declined are more obvious than the effect on number of categories that improved. Therefore I concentrate on the number of categories that declined in this section, while the effects on number of categories that improved are shown in the appendix (Table A.1 and Table A.2).

Table 6 shows the effect on the number of categories that declined according to the wife. We can see that without any district controls the effect of change in labour demand for women on the number of categories that declined is -4.8. Meaning a 10 percent increase in demand for female labour in large and medium manufacturing will decrease the number of categories in which wife's power decline by 0.48. Considering that 2.69 categories declined between 2000 and 2007, the magnitude of the demand effect is large. The coefficient in front of change in demand for male labour is not significant, but positive and large. When adding controls of district characteristics and province fixed effect, the coefficients become insignificant but remains similar with the coefficients without district controls. When controlling further for shares of 2-digit level industries in total employment of the district, the coefficient in front of change in female labour demand remains negative but insignificant, while the coefficient in front of change in male labour demand remains positive, becomes significant and much larger in magnitude. A 10 percent increase in demand for male labour in large and medium manufacturing would increase the number of categories in which wife's power decline by 1.8, which is 67 percent of the number of categories that actually declined

during the period. When restricting to only low concentration districts, the sign and significance of the coefficients remain the same, but the magnitudes become even larger.

The signs of coefficients are remarkably consistent across specifications and samples, while the magnitude becomes larger when controlling for 2-digit industry shares and when restricting to low concentration districts. This is expected as different variation (within industry group variation) is used when controlling for 2-digit industry shares and different sample is used for the low concentration districts. However, the general pattern remains the same: increase in women's labour demand makes their decision power less likely to decline and increase in men's labour demand makes women's decision power more likely to decline. The effect of labour demand is large.

[Table 6]

Table 7 shows the effect on number of categories that declined according to husband. In general coefficients are similar to the ones estimated according to wife's reports. The coefficients in front of change in female labour demand is always negative across specifications and samples, while that in front of change in male labour demand is always positive. The coefficients are not significant without district controls, and becomes significant when controlling for district characteristics and province fixed effect. The significance and magnitude of coefficients increase when controlling for 2-digit industry shares and when restricting to low concentration districts. The major difference between the results according to husband's report and according to wife's report is that within low concentration districts, the effect of change in female labour demand is significant and large, while the effect of change in male labour demand is significant and large according to the wife's report.

However, the general pattern of a decline in wife's power when male labour demand increases relative to female labour demand remains the same.

[Table 7]

The results in this section consistently show that increase in female labour demand in large and medium manufacturing relative to male labour demand increases wives' decision power by reducing the number of categories in which wife's power decline. These results are robust when restricting the sample to districts with lower industry concentration, supporting the validity of the exogenous industry shock interpretation discussed in Borusyak et al. (2020). They are also robust to the control of district characteristics and local big industry group shares, which suggests that the exogenous shares interpretation in Goldsmith-Pinkham et al. (2020) may also be valid for this paper.

4.3: Results by decision category

Table 8 and Table 9 show the results by decision category. For all regressions by decision category I use full control of district characteristics, province fixed effect, 2-digit industry shares, and restrict to low concentration districts. I choose this specification because this is the most restricted specification and would show the most conservative estimates.

Table 8 shows that according to wife, across categories the general pattern is that increase in female labour demand decreases the likelihood of a decline in power, while increase in male labour demand increase the likelihood of a decline of power. The categories with significant coefficients are concentrated in public goods (food and routine purchase) and private goods (wife's clothes and husband's clothes), while the coefficients for decisions related to children are not significant. For the significant coefficients, the magnitude is large.

For example, for the decision on expenditure on wife's clothes, a 10 percent increase in male labour demand would increase the likelihood of the wife's power declining by 65 percent.

The only category that is inconsistent with the general pattern is the decision on the time husband spends socializing. An increase in male labour demand would decrease the likelihood of wife's power declining for this category. This could be due to the fact that the respondents can mistake the decision on time spent socializing with the actual time spent socializing, and an increase in male labour demand could mean the husbands have less time socializing.

[Table 8]

Table 9 shows the results according to the reports by the husband. We can see that the patterns according to the husband are different from the ones according to the wife. For more routine decisions such as expenditure on food, expenditure on routine purchases and expenditure on children's clothes, an increase in male labour demand decreases the likelihood that wife's power decline. While for less routine and potentially bigger decisions such as gifts for parties and weddings and time wife socializing, an increase in male labour demand increases the likelihood of the wife's power declining. This is an interesting pattern and could show how respondents view the decision categories and their relation to decision power. Routine decisions can be viewed more as a chore which the husbands have less time to spend on when they work more, while who makes decision on less routine decisions could reflect more about who has actual decision power.

Interestingly, the significant coefficients in front of the change in female labour demand are universally negative, and are only found for non-routine decisions except for children's clothes. This indicates that from the husband's point of view, an increase in female

labour demand reduces the likelihood of wife's decision power declining for non-routines household decisions. Importantly, according to the husband an increase in female labour demand makes wife's power less likely to decline for all decision categories regarding children. The magnitudes of these effects are large. For example, for the decision on children's education, a 10 percent increase in female labour demand would decrease the likelihood of wife's decision power declining by 32 percent. The fact that husband perceive their wives of having more power on decisions relating to children when female labour demand increases is important since the increase in power is more significant when husband also agrees. Also increase in wife's decision power regarding children can lead to better outcomes for children, as shown in the literature.

[Table 9]

4.4: Effects on women who do not work

Bargaining theory predicts that the change in labour market opportunities would increase women's bargaining power even for women who are not currently working. This is because labour market opportunities affect women's potential earning as well as actual earning, and potential earning is what matters in bargaining as outside option is decided by potential earning. To test this prediction, I conduct the same regressions restricting the sample to couples where the wives were not working in 2000. The main results for these regressions are shown column (6) of Table 6 and Table 7. I again use the most conservative specification and sample. We can see that the results are highly consistent when all women are included and when only non-working women are included. This evidence supports the prediction of bargaining theories.

4.5: Effect on employment outcomes

Table 10 shows the effect of the labour demand measures on employment outcomes of women. We can see that the results are robust across specifications and samples, especially for the effect of change in female labour demand. A 10 percent increase in female labour demand increases the likelihood of the wife starting working by 8 – 14 percent, and decreases the likelihood of the wife stopping working by 6-16 percent, depending on the sample and specification. These results show that the labour demand measures used in this paper can be related to actual employment outcomes. The effect of an increase in male labour demand is less obvious. It seems that an increase in male labour demand tend to decrease the likelihood of the wife starting working, and increase the likelihood of the wife stopping working, suggesting a negative household income effect on female employment.

[Table 10]

4.6: Pre-trend analysis

Since both Borusyak et al. (2020) and Goldsmith-Pinkham et al. (2020) suggest conducting pre-trend analysis to assess the validity of the identification assumptions, I conduct the pre-trend analysis by regressing change in decision power in a previous period (1997-2000) on the change in labour demand in the current period. The results are in column (7) and (8) of Table 6 and Table 7. We can see that without district controls and without excluding the high industry concentration districts, the coefficients in front of the labour demand measures are not significant. When including full controls and restricting to low concentration districts, however, the coefficients become significant, failing the pre-trend test. This result is likely due to the fact that industry employment growth is correlated over time, which does not directly violate the identification assumptions of either Borusyak et al.

(2020) or Goldsmith-Pinkham et al. (2020). In the Indonesian context, the 1997-2000 period is the Asian Financial Crisis period, and the 2000-2007 period is a recovery period from the crisis. Therefore it is likely that the industries that had a bigger hit during the crisis would have a bigger recovery during the 2000-2007 period. The fact that the most significant coefficients in the pre-trend analysis are of the opposite signs of the coefficients in the main analysis supports this hypothesis.

5. Conclusion and discussion

The development literature and the literature on household decisions both emphasize the importance of understanding women's intra-household bargaining power. However, the measurement of, and as a result, the determinants of women's intra-household bargaining power remain elusive. This paper aims to contribute to the understanding of women's intra-household bargaining power by utilizing unique longitudinal information on household decision making from a developing country to measure women's intra-household decision power, and analyse the effect of labour market opportunities on these measures. It also builds on the literature and recent methodological discussion on Bartik instruments to construct and test arguably exogenous measures of gender-specific labour demand suitable to the context of the developing country I study.

I find that in Indonesia, increase in demand for female labour in large and medium manufacturing relative to demand for male labour increases women's intra-household decision power. The effect is large in magnitude, especially for decision categories relating to children according to the husband's response. Supporting bargaining theories, I also find that the effect of labour demand on women's decision power extend to women who do not currently work. The results are in general consistent across an array of specifications controlling for various district characteristics, and also consistent when restricting to low industry concentration districts, therefore supporting the validity assumptions discussed by

recent literature on Bartik instruments. These results do not pass the pre-trend test, however, suggesting that industry employment growth used in canonical Bartik labour demand measures could be serially correlated. Nevertheless, this finding does not violate the identification assumptions directly, and provides reference to studies that use Bartik labour demand measures.

The fact that labour market opportunities have such significant and large effect on household decision making power is an important finding, and variation of the results across decision categories and between wife's and husband's responses all offer interesting insight into the black-box of household decisions. Together they show that direct questions on household decision making like the ones used in the Indonesian Family Life Survey can be useful in understanding the complexity of household decisions and the relationship between the decision making process and other economic forces. It is unclear, however, how one can use these information to establish relationship between the decision making process and actual household outcomes, which will be an important next step for this line of research. It will also be interesting to look at how the same relationship differ among different economic and cultural contexts. The similarity in results between this paper and Majlesi (2016) suggests that the effect of labour market opportunities on women's position in the household can be similar in vastly different contexts such as the ones of Mexico and Indonesia. More studies in other societies are needed, however, to establish this relationship further.

References

Ambrus, Attila, Erica Field, and Maximo Torero. 2010. “Muslim Family law, Prenuptial Agreements, and the Emergence of Dowry in Bangladesh.” *Quarterly Journal of Economics* 125 (3): 1349-1397.

Anderson, Siwan, and Mukesh Eswaran. 2009. “What Determines Female Autonomy? Evidence from Bangladesh.” Journal of Development Economics 90 (2): 179–191.

Antman, Francisca M. 2014. “Spousal Employment and Intra-Household Bargaining Power.” *Applied Economics Letters* 21 (8): 560–563.

Autor, David H., David Dorn, and Gordon H. Hanson. 2013. “The China Syndrome: Local Labor Market Impacts of Import Competition in the United States.” *American Economic Review* 103 (6): 2121–2168.

Autor, David, David Dorn, and Gordon Hanson. 2019. “When Work Disappears: Manufacturing Decline and the Falling Marriage Market Value of Young Men.” AER: Insights 1(2): 161-178

Baland, Jean-Marie, and Roberta Ziparo. 2017. “Intra-Household Bargaining In Poor Countries.” WIDER Working Paper 2017/108 Helsinki: UNU-WIDER.

Bartik, Timothy J. 1991. *Who Benefits from State and Local Economic Development Policies?* W.E. Upjohn Institute for Employment Research, Kalamazoo.

Blanchard, Oliver, and Lawrence F. Katz. 1992. “Regional Evolutions.” Brookings Papers on Economic Activity 1.

Bobonis, Gustavo J. 2011. “The Impact of Conditional Cash Transfer on Marriage and Divorce.” *Economic Development and Cultural Change* 59 (2): 281-312.

Borusyak, Kirill, Peter Hull and Xavier Jaravel. 2020. “Quasi-Experimental Shift-Share Research Designs.” *NBER Working Paper Series* Working Paper 24997.

Bound, John, and Harry J. Holzer. 2003. “Demand Shifts, Population Adjustments, and Labor Market Outcomes during the 1980s.” *Journal of Labor Economics* 18 (1): 20–54.

Chiappori, Pierre-Andre, Bernard Fortin, and Guy lacroix. 2002. “Marriage Market, Divorce legislation and Household labor Supply.” *Journal of Political Economy* 110 (1): 37–72.

Chiappori, Pierre-Andre, and Maurizio Mazzocco. 2017. “Static and Intertemporal Household Decision.” *Journal of Economic Literature* 55 (3) : 985-1045.

Doepke, Matthias, and Michèle Tertilt. 2014. “Does Female Empowerment Promote Economic Development?” NBER Working Paper No. 19888.

Duflo, Esher. 2003. “Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa.” *World Bank Economic Review* 17 (1): 1-25.

Duflo, Esher. 2012. “Women Empowerment and Economic Development.” *Journal of Economic Literature* 50 (4): 1051-1079.

Dong, Sarah X., and Chris Manning. 2017. “Labour-Market Developments at a Time of Heightened Uncertainty.” *Bulletin of Indonesian Economics Studies* 53 (1): 1-25.

Doss, Cheryl. 2013. “Intrahousehold bargaining and resource allocation in developing countries.” Policy Research working paper no. WPS 6337. Washington, DC: World Bank.

Frankenberg, Elizabeth, and Duncan Thomas. 2001. “Measuring Power.” International Food Policy Research Institute Food Consumption and Nutrition Division Discussion Paper, No. 113.

Geertz, Hildred. 1961. *The Javanese Family : a Study of Kinship and Socialization*. Prospect Heights, Illinois: Waveland Press, 1989, c1961

Gobel, Rachmat. 2014. “Indonesia Must Reenergize its Manufacturing Sector.” *Jakarta Post*. [online] Available at: http://www.thejakartapost.com/news/2014/09/18/indonesia-must-reenergize-its-manufacturing-sector.html [Accessed 4 Dec. 2018].

Goldsmith-Pinkham, Paul, Isaac Sorkin, and Henry Swift. 2020. “Bartik Instruments: What , When ,Why and How.” *American Economic Review* 110(8): 2586-2624.

Heath, Rachel, and A. Mushfiq Mobarak. 2015. “Manufacturing Growth and the Lives of Bangladeshi Women.” Journal of Development Economics 115: 1-15.

Hill, Hal. 2000. The Indonesian Economy. Cambridge University Press.

Lundberg, Shelly, and Robert A. Pollak. 1993. “Separate Spheres Bargaining and the Marriage Market.” *Journal of Political Economy* 101 (6): 988–1010.

Lundberg, Shelly J., Robert A. Pollak, and Terrence Wales. 1997. “Do Husbands and Wifes Pool Their Resources? Evidence from the United Kingdom Child Benefit.” *Journal of Human Resources* 32(3): 463-480.

Majlesi, Kaveh. 2016. “Labor Market Opportunities and Women’s Decision Making Power within Households.” Journal of Development Economics 119: 34-47.

Manser, Marilyn, and Murray Brown. 1980. “Marriage and Household Decision-Making: A Bargaining Analysis.” *International Economic Review* 21 (1): 31–44.

Mazzocco, Maurizio. 2007. “Household Intertemporal Behaviour: A Collective Characterization and a Test of Commitment.” *Review of Economic Studies* 74 (3): 857–95.

McElroy, Marjorie B., and Mary Jean Horney. 1981. “Nash-Bargained Household Decisions: Toward a Generalization of the Theory of Demand.” *International Economic Review* 22 (2) :333–349.

Qian, Nancy. 2008. “Missing Women and the Price of Tea in China: The Effect of Sex-Specific Earnings on Sex Imbalance.” *Quarterly Journal of Economics* 123 (3): 1251-1285.

Schaller, Jessamyn. 2016. “Booms, Busts, and Fertility: Testing the Becker Model Using Gender-Specific Labor Demand.” *Journal of Human Resources* 51(1): 1-29.

Selin, Håkan. 2014. “The Rise in Female Employment and the Role of Tax Incentives. An Empirical Analysis of the Swedish Individual Tax Reform of 1971.” *International Tax and Public Finance* 21(5): 894-922.

Shenhav, Na’ama. Forthcoming. “Lowering Standards to Wed? Spouse Quality, Marriage, and Labor Market Responses to the Gender Wage Gap.” *Review of Economics and Statistics.*

United Nations. 2012. “World Fertility Report 2012.” Department of Economic and Social Affair, Population Division, United Nations.

Voena, Alessandra. 2015. “Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?” *American Economic Review* 105 (8): 2295-2332.

World Bank. 2012a. “Picking up the Pace: Reviving Growth in Indonesia’s Manufacturing Sector.” Jakarta: World Bank.

World Bank. 2012b. “Policy Note 1: Why the Manufacturing Sector Still Matters for Growth and Development in Indonesia.” Jakarta: World Bank.

Table 1. Wage difference between other industries and manufacturing
Salaried workers without tertiary education, 2014

	All		Male		Female	
Industry	Wage difference	Employment share	Wage difference	Employment share	Wage difference	Employment share
Agriculture	-0.13***	0.14	-0.15***	0.15	-0.07***	0.11
Mining	0.24***	0.04	0.27***	0.05	0.16**	0.01
Manufacturing		0.20		0.18		0.25
Utilities	-0.04	0.01	-0.03	0.01	0.17	0.00
Construction	-0.00	0.09	0.01	0.13	0.09	0.01
Trade	-0.19***	0.16	-0.18***	0.13	-0.24***	0.22
Transportation	-0.05***	0.06	-0.03***	0.08	-0.03	0.01
Finance	-0.10***	0.04	-0.08***	0.04	-0.13***	0.03
Social services	-0.34***	0.27	-0.23***	0.22	-0.52***	0.37

Calculated by author using 2014 Indonesian Labor Force Survey. The wage difference is the coefficient in front of the industry dummies when regressing log wage on industries, education, gender, age, and province. The omitted industry is manufacturing. This table only includes salaried workers. * ** ***represents 10%, 5%, 1% significance levels.

Table 2: District characteristics in terms of employment in 2001

	All districts* (N=308 districts)			Districts in analysis (N=171 districts)		
	Median	Mean	SD	Median	Mean	SD
Number of 5-digit industries male	9	22	34	17	31	39
Number of 5-digit industries female	7	18	28	13	25	33
Share of large and medium manufacturing male	0.01	0.04	0.1	0.01	0.03	0.03
Share of large and medium manufacturing female	0.01	0.06	0.26	0.01	0.05	0.08
Men's employment rate	0.85	0.84	0.07	0.85	0.84	0.07
Women's employment rate	0.58	0.58	0.18	0.58	0.58	0.16

Calculated by author using the 2001 Large and Medium Manufacturing Census and the 2000 Population Census. *These districts do not include districts in the province of Aceh as the author do not have complete district code information for Aceh.

Table 3: Industry concentration across districts in 2001

	Male (N=338 industries)			Female (N=326 industries)		
	Median	Mean	SD	Median	Mean	SD
Number of districts with the industry	15	20	22	15	21	22

Mean concentration in a district	0.07	0.16	0.24	0.07	0.14	0.21
Max concentration in a district	0.33	0.4	0.23	0.42	0.48	0.26

Calculated by author using the 2001 Large and Medium Manufacturing Census

Table 4: Level and change of decision power
(N=3534)

Decision category	Decision pattern 2000				Change 2000-2007	
	Wife	Joint	Husband	Other	Improve	Decline
Food	0.70	0.16	0.05	0.09	0.20	0.26
Routine purchase	0.67	0.19	0.06	0.08	0.23	0.24
Wife's clothes	0.59	0.34	0.06	0.02	0.22	0.28
Husband's clothes	0.28	0.43	0.27	0.02	0.31	0.25
Children's clothes	0.36	0.44	0.06	0.15	0.21	0.31
Children's education	0.13	0.68	0.07	0.12	0.19	0.16
Children's health	0.16	0.74	0.05	0.05	0.14	0.18
Large purchase	0.06	0.72	0.14	0.08	0.21	0.14
Gifts for parties/weddings	0.18	0.73	0.07	0.02	0.15	0.18
Time husband socializing	0.10	0.45	0.45	0	0.32	0.26
Time wife socializing	0.41	0.49	0.10	0	0.25	0.31
Whether husband/wife works	0.05	0.64	0.30	0.01	0.26	0.14

Calculated by author using Indonesian Family Life Survey 2000 and 2007. This table is based on wives' responses. The numbers are similar when based on husbands' responses.

Table 5: Summary statistics

Couple Level	Full sample N=3534		Low concentration districts N=2366	
	Mean	SD	Mean	SD
Number of decision categories improved (according to wife)	2.69	2.01	2.67	2.04
Number of decision categories improved (according to husband)	2.72	2.07	2.66	2.04
Number of decision categories declined (according to wife)	2.69	2.08	2.63	2.03
Number of decision categories declined (according to husband)	2.79	2.12	2.76	2.10
Percent of wives working	0.58	0.49	0.60	0.49
Percent of husbands working	0.98	0.16	0.97	0.16
Percent wife start working	0.19	0.39	0.19	0.39
Percent wife stop working	0.16	0.36	0.16	0.37

Age of wife	37	10	37	11
Age of husband	42	11	43	12
Percent urban	0.40	0.49	0.39	0.49
Education (started)	Wife	Husband	Wife	Husband
No school	0.11	0.07	0.11	0.08
Primary	0.56	0.52	0.55	0.52
Junior high	0.16	0.15	0.16	0.15
Senior high	0.10	0.11	0.10	0.11
Senior high vocational	0.07	0.10	0.08	0.09
Post-secondary		0.05		0.05

District Level	Full sample N=171		Low concentration districts N=125	
	Mean	SD	Mean	SD
Δ in demand for female labour	-0.007	0.035	-0.005	0.04
Δ in demand for male labour	-0.005	0.018	-0.004	0.02
Share of large and medium manufacturing female	0.05	0.08	0.03	0.08
Share of large and medium manufacturing male	0.03	0.03	0.02	0.02
Distance to provincial capital (in km)	83	58	91	61
Distance to national capital (in km)	677	428	745	415
Population (in millions)	0.86	0.67	0.66	0.47
Non-oil GDP per capita (in million Rupiah)	15.04	15.42	13.79	16.54
Female employment rate	0.58	0.16	0.60	0.17
Percent of women with no school	0.38		0.39	
Percent of women with primary school	0.34		0.34	
Percent of women with junior high	0.13		0.13	
Percent of women with senior high	0.13		0.12	
Percent of women with post-sec.	0.02		0.02	

Low concentration districts are the ones with a maximum concentration of any 5-digit industry of less than 0.5.

Table 6: Effect on number of categories that declined according to wife

	All women					Non-working	Pre-trend	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in labour demand female	-4.8**	-3.8	-3.1	-2.2	-6.3	4.5	-1.9	14.8***
	(2.0)	(2.4)	(2.5)	(4.3)	(5.4)	(6.4)	(3.9)	(3.9)

Change in labour demand male	5.8	4.6	3.0	17.9**	33.0***	32.4***	-3.7	-27.4***
	(3.9)	(4.0)	(3.7)	(7.3)	(8.8)	(11.3)	(5.2)	(6.6)
Share of manu. female	-0.3	-0.5	-1.2	0.8	-18.1**	-24.9**	0.9	-2.2
	(0.7)	(1.4)	(1.4)	(5.8)	(8.1)	(12.5)	(1.2)	(5.4)
Share of manu. male	-1.0	-1.3	-0.2				-2.4	
	(2.3)	(2.4)	(2.2)				(3.5)	
District char.		X	X	X	X	X		X
Prov. fixed effect			X	X	X	X		X
2-digit industry shares				X	X	X		X
Low concentration districts					X	X		X
R-square	0.026	0.030	0.040	0.051	0.063	0.110	0.026	0.078
N	3534	3534	3534	3534	2366	954	2633	1774

Standard errors are clustered at the district level. * 0.1, ** 0.05 and *** 0.01 significance level.

Table 7: Effect on number of categories that declined according to husband

	All women					Non-working	Pre-trend	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in labour demand female	-1.3	-3.3	-3.9*	-5.2	-15.7***	-11.8*	-0.5	4.5
	(1.9)	(2.1)	(2.2)	(3.1)	(4.7)	(6.7)	(2.3)	(4.1)
Change in labour demand male	4.1	4.9	3.4	11.4**	-2.1	3.6	3.6	13.5*
	(3.8)	(3.6)	(3.6)	(5.6)	(9.1)	(12.2)	(4.9)	(8.0)
Share of manu. female	0.2	-1.3	0.2		-14.2	-35.3**	0.09	-9.9
	(0.9)	(1.6)	(1.9)		(9.1)	(14.5)	(0.8)	(7.3)
Share of manu. male	-0.9	-3.2	-4.7				1.8	
	(3.2)	(3.5)	(3.7)				(2.2)	
District char.		X	X	X	X	X		X
Prov. fixed effect			X	X	X	X		X
2-digit industry shares				X	X	X		X
Low concentration districts					X	X		X
R-square	0.027	0.031	0.043	0.055	0.078	0.142	0.022	0.067

N	3534	3534	3534	3534	2366	954	2633	1774

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.

Table 8: Effect on power decline by category according to wife

(N=2366)

Dependent variable	Whether wife's power declined in ..				
	Public goods				
	Food	Routine purchase	Gifts for parties/weddings	Large purchase	
Change in labour demand female	-0.7	-2.4***	1.7*	-1.3	
	(0.8)	(0.9)	(0.9)	(1.1)	
Change in labour demand male	7.1***	4.3***	5.3***	2.5	
	(1.6)	(1.5)	(1.5)	(1.6)	
	Children				
	Children's health	Children's clothes	Children's education		
Change in labour demand female	-1.0	0.1	-0.6		
	(0.7)	(1.0)	(0.7)		
Change in labour demand male	0.9	2.5	1.9		
	(1.4)	(1.9)	(1.1)		
	Private goods				
	Wife's clothes	Husband's clothes	Time husband socializing	Time wife socializing	Whether hus/wife works
Change in labour demand female	0.5	-1.3	-0.7	-0.8	0.3
	(1.1)	(0.8)	(0.9)	(1.2)	(0.7)
Change in labour demand male	6.5***	4.2**	-4.6***	3.6	-1.2
	(1.7)	(1.7)	(1.6)	(2.2)	(1.2)

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.

Table 9: Effect on power decline by category according to husband

(N=2366)

Dependent variable	Whether wife's power decline in ..
	Public goods

	Food	Routine purchase	Gifts for parties/weddings	Large purchase	
Change in labour demand female	1.1	-0.3	-0.8	-1.7*	
	(1.0)	(1.0)	(0.8)	(1.1)	
Change in labour demand male	-3.2*	-3.7**	3.3*	1.1	
	(1.7)	(1.6)	(1.9)	(1.6)	
	Children				
	Children's health	Children's clothes	Children's education		
Change in labour demand female	-3.2***	-1.7**	-3.2***		
	(0.9)	(0.9)	(0.7)		
Change in labour demand male	-0.6	-2.9*	-0.6		
	(1.7)	(1.5)	(1.7)		
	Private goods				
	Wife's clothes	Husband's clothes	Time husband socializing	Time wife socializing	Whether hus/wife works
Change in labour demand female	-0.9	-2.1**	-0.02	-2.1**	-0.6
	(0.8)	(0.8)	(1.0)	(0.9)	(0.8)
Change in labour demand male	-3.2*	1.9	-0.8	4.4**	1.7
	(1.7)	(1.7)	(1.8)	(1.8)	(1.2)

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.

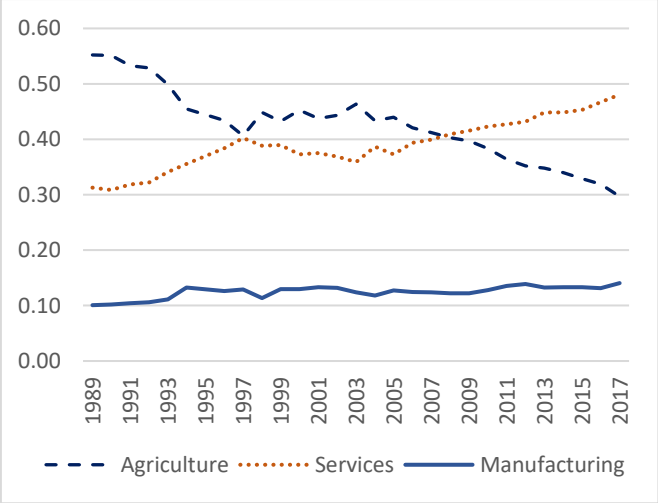
Table 10: Effect on women's employment status

	Start working			Stop working		
	(1)	(2)	(3)	(4)	(5)	(6)
Change in labour demand female	0.8*	1.1	1.4**	-0.6	-1.6***	-1.5*
	(0.5)	(0.7)	(0.6)	(0.4)	(0.5)	(0.8)
Change in labour demand male	-3.1***	-3.9***	-1.9	1.4**	1.0	0.3
	(0.7)	(1.3)	(1.5)	(0.6)	(1.1)	(1.6)
Share of manufacturing female	-0.1	-0.3	-5.9***	0.2	-0.7	-1.6
	(0.3)	(0.9)	(1.2)	(0.3)	(0.8)	(1.5)
Share of manufacturing male	-0.6			0.5		
	(0.6)			(0.6)		

District characteristics	X	X	X	X	X	X
Province fixed effect	X	X	X	X	X	X
2-digit industry shares		X	X		X	X
Low concentration districts			X			X
R-square	0.041	0.048	0.069	0.030	0.039	0.046
N	3534	3534	2366	3534	3534	2366

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.

Figure 1. Share of Total Employment by Sector



Calculated by author using industry employment numbers from Indonesian Central Bureau of Statistics

Appendix:

Table A.1: Effect on number of categories that improved according to wife

	All women					Non-working	Pre-trend	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in labour demand female	-0.005 (2.7)	3.4 (2.9)	3.4 (2.7)	3.6 (3.3)	6.3 (4.0)	3.2 (7.2)	-2.5 (1.8)	-12.6*** (4.5)
Change in labour demand male	2.7 (5.0)	0.5 (4.4)	-0.6 (4.1)	-14.7** (5.8)	-16.5* (8.7)	-25.1** (10.8)	2.7 (2.9)	19.1** (7.8)
Share of manu.	1.0	4.1***	4.2***	1.9	-3.3	39.5***	1.2	-33.9***

female	(0.9)	(1.5)	(1.4)	(4.2)	(6.8)	(11.2)	(0.7)	(7.0)
Share of manu. male	-2.2 (2.6)	-3.4 (2.8)	-4.6* (2.6)				-3.2 (2.4)	
District char.		X	X	X	X	X		X
Prov. fixed effect			X	X	X	X		X
2-digit industry shares				X	X	X		X
Low concentration districts					X	X		X
R-square	0.031	0.035	0.049	0.060	0.078	0.126	0.018	0.065
N	3534	3534	3534	3534	2366	954	2633	1774

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.

Table A.2. Effect on number of categories that improved according to husband

	All women					Non-working	Pre-trend	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Change in labour demand female	-0.7 (2.2)	3.4* (2.0)	1.3 (2.0)	-1.0 (2.7)	6.5* (3.7)	8.3 (6.7)	-2.8 (2.0)	-14.8*** (4.2)
Change in labour demand male	2.0 (4.4)	-0.9 (3.5)	1.2 (3.3)	-8.8 (5.9)	-11.5 (7.3)	-17.4 (12.0)	5.5 (4.1)	24.1*** (8.5)
Share of manu. female	0.6 (0.9)	2.5* (1.3)	1.0 (1.2)	3.6 (4.3)	-1.1 (6.1)	39.2*** (12.1)	0.4 (0.8)	-18.9** (9.0)
Share of manu. male	-1.1 (2.5)	-3.2 (2.5)	-4.2** (2.1)				-1.4 (2.4)	
District char.		X	X	X	X	X		X
Prov. fixed effect			X	X	X	X		X
2-digit industry shares				X	X	X		X
Low concentration districts					X	X		X
R-square	0.020	0.027	0.042	0.050	0.065	0.084	0.024	0.058
N	3534	3534	3534	3534	2366	954	2633	1774

Standard errors are in brackets and are clustered at district level. * ** ***represents 10%, 5%, 1% significance levels.