Gender Penalty of First-Born Child on Female Labour Force Participation and Autonomy of Mothers in India

Advaith Jayakumar[1] & Shubhashree Jha[2]

1. Department of Economics, Columbia University
2. National Centre for Applied Economic Research, Delhi

Abstract

We focus on the differential impacts of the sex of the firstborn child on the FLFP of the mother. The rationale is that the sex of the first-born is random and from the second child onwards sex-selective abortions can occur. We hypothesize that if the mother's firstborn is female, her FLFP increases because she would be expected to "compensate" the female birth due to son preference. Likewise, her FLFP falls if she gives birth to a male firstborn as she would be expected to raise a healthy son. We also focus on the differential effect on the mother's autonomy both mobility and financial conditional on the birth of the preferred sex (male). We find that if the sex of the firstborn is male, the FLFP and autonomy decrease relative to a female firstborn in rural areas, while only the autonomy of the

mother decreases in urban areas.

1.   INTRODUCTION

Economists have consistently tried to grapple with the low levels of Female Labour Force Participation (LFP) in India even in periods of economic growth and rising levels of education. (Afridi et al., 2020; Kansen and Pieters, 2015; Abraham et. al, 2017; Chatterjee and Sircar, 2021).[1]

We focus on the differential impacts of the sex of the first-born child on the FLFP of the mother. The rationale is that the sex of the first-born is random and from the second child onwards sex-selective abortions can take place (Jayachandran, 2001; Portner, 2014). We hypothesize that if the mother's first-born is female, her FLFP increases because she would be expected to "compensate" the female birth due to son preference. Likewise, her FLFP falls if she gives birth to a male first-born as she would be expected to raise a healthy son. We also focus on the differential effect on the mother's autonomy both mobility and financial conditional on the

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[1] According to International Labour Organization (ILO), India's FLFP has dropped from a high of 32% in 2005 to 18% in 2020. This is alarmingly low when compared to other developing countries in Asia. "Labor Force Participation Rate, Female (% of Female Population Ages 15+) (Modeled ILO Estimate) - India," Data, https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?end=2020&locations=IN&start=2000.

birth of the preferred sex (male). Both these analyses are carried out separately for rural and urban areas. We find that if the sex of the first-born is male, the FLFP and autonomy decrease relative to a female first-born in rural areas, while only the autonomy of the mother decreases in urban areas.

The rest of the paper is organised as follows. Section 2 provides a brief literature review followed by Section 3 on data and the empirical strategy. Section 4 provides descriptive statistics. Section 5 discusses the results and robustness checks. Section 6 offers concluding comments.

2.   LITERATURE REVIEW

Previous literature finds that a notion of women not "needing" to earn for the family is prevalent as family income levels increase. Arif et. al., 2002 ascertain that the economic participation of women is significantly influenced by factors like their age, education[2] and marital status. Similarly, Batool et al. 2019 find that household income, and the number of children appear to be negatively correlated with FLFP. The idea of the motherhood penalty has been explored by Bronars and Grogger, 1994; Angrist and Evans, 1998; and Deshpande and Singh, 2021. Additionally, Arif. et al. 2003, and Farid et al., 2009 highlight the impact of 0-5 aged children as a driving factor behind women dropping out.

Ichino et. al., 2014 observe that in the US, the UK, Sweden and Italy, women whose first-born are males are less likely to work and for a lesser number of hours than women with first-born females. This is an interesting observation because we would expect to see this in developing countries where the male child preference is high.

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[2] As more women opt for higher education, their labour force participation decline.

We hypothesise that if the first-born child is a female, taking into account male preference for children, the mother would be expected to "compensate" for giving birth to a female child by working. However, if a male child is born, the mother would be expected to stay at home. Like Ichino et. al., 2014, we exploit the exogeneity in the sex of the first-born child as it is random. This paper contributes to the existing literature by evaluating the result obtained by Ichino et. al., 2014 using Indian data to explain the "compensation" channel to understand dropping FLFP.

This paper will also look at the impact of the sex of the first-born on the autonomy of a mother. There is rather low literature looking at the differential impacts of the sex of the first-born on the mother's autonomy but it highlights the importance of autonomy. There are improved benefits of the autonomy of the mother on the child's nutritional status (Grabowski and Self, 2013) and resource allocation within the family (Anderson and Eswaran, 2009). We hypothesize that male first-born children should lead to increased autonomy for the mother.

3. DATA AND EMPIRICAL STRATEGY

This paper uses the National Family Health Survey - Round 4 (NFHS 4) in 2015-16. For our analysis, we have merged the Individual (Women's) Recode and the Birth (Children's) Recode.

We use Linear Probability Model (LPM) to analyse the impact of the sex of the first-born on the outcome variables. We run separate regressions for the rural and urban samples in the dataset since the functional relationship between variables differs across rural and urban areas. There is vast heterogeneity that needs to be accounted for and splitting the sample will be cleaner for the analysis. This will also help us disaggregate the effect that we are trying to pick up. The sample is restricted to mothers who have given their first birth in the last 3 years (from the time of the survey).

Outcome Variables

We have three dependent variables of interest.

We measure the mother's FLFP by seeing whether she has worked in the last 12 months. This is constructed as a binary variable equalling 1 if the mother worked in the last 12 months, and 0 otherwise.

The mother's autonomy is categorised through two channels: first, is her autonomy over movement, whether she can decide where she wants to go outside of the house or is it dependent on a family member's permission. Second, whether she has control over her finances to use her wealth at her discretion or is it dependent on other members. The driving argument behind this is that increased autonomy would improve a mother's bargaining power within the family and take more independent decisions.

Autonomy over mobility is therefore a binary that has been constructed by using three different mobility autonomy indicators. It equals 1 if the mother is allowed to do at least one of these three things: visit a healthcare centre, visit the market and/or go outside the village, and equaling 0 otherwise.

Financial Autonomy is a binary variable which equals 1 if the mother has the autonomy to decide how to spend her earnings, and 0 if the decision lies with her husband/other family members.

Such diverse indicators of autonomy are chosen, and the driving idea behind this is that there is a possibility that a woman may have a certain type of autonomy over the other based on norms, preferences and priority of types of autonomy. Thus, to try and understand the biggest

and smallest of freedoms, we employ various indicators of mobility.

Independent variable

The independent variable of interest is the sex of the first-born child since the sex of the first-born child is randomised (Sharma and Rastogi, 2020). Thus, sex-selective abortions cannot take place for the first-born child. Literature has shown that sex-selective abortions can take place from the second child onwards (Jayachandran, 2014). We thus generate a binary variable *Male* which equals 1 when the first-born child is a male, and it equals zero when it is a female.

Controls

We control for the income of the family (through the wealth index), the education level of the mother, whether the household head is a female, whether the partner is working, if the respondent justifies domestic violence due to child neglect, the religion of the mother, whether the mother belongs to a historically marginalised community (SC/ST/OBC), the age gap between the couple, whether the child has received all five under-5 immunizations and finally, whether child is stunted (HAZ ratio).[3]

Fixed Effects

Additionally, we have included state-fixed effects to account for state-level time-invariant differences in norms and cultures which prevail and may influence the FLFP.

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[3] Height cannot be reversed and thus captures the cumulative health effect. We make use of stunted, "the best anthropometric measure of net nutrition" as a measure of child health outcome (Jayachandran & Pande, 2015). An under-5 child is stunted if the child's HAZ ratio is 2 standard deviations below the WHO reference median. In our analysis, the variable "stunted" is coded as 1 if the child is stunted and 0 if the child is not. Complete immunization of the child and the HAZ ratio function as variables indicating whether the child is healthy or not. If the child is unhealthy, the mother may anyway stay at home to take care of the child and thus there may be an observed decline in her LFP.

The regression equations are as follows:

$$FLFP_{ihs} = \beta_0 + \beta_1 Male_{ihs} + \delta X_i + \alpha + \epsilon \qquad\qquad -(A)$$

$$Mobility\ Autonomy_{ihs} = \beta_0 + \beta_1 Male_{ihs} + \delta X_i + \alpha + \epsilon \qquad -(B)$$

$$Financial\ Autonomyy_{ihs} = \beta_0 + \beta_1 Male_{ihs} + \delta X_i + \alpha + \epsilon \qquad -(C)$$

Where,

$FLFP_{ihs}$: FLFP of the mother i in household h in state s

$Mobility\ Autonomy_{ihs}$: autonomy of the mother over her mobility

$Financial\ Autonomy_{ihs}$: autonomy of the mother over her wealth

$Male_{ihs}$: sex of the first-born child (1, male; 0, female)

X_i : Control variables

α : state level fixed effects

ϵ : error term

4. DESCRIPTIVE STATISTICS

Summary statistics of the variables are included in *Table 1 and 2*. The total number of women who have given birth to their first child within 3 years before the survey is 257,314.

Table 1 : Summary Statistics: Dependent Variables

			Sex of the First-Born Child		
Variable	Female	Percent	Male	Percent	Total
Type of Residence					
Urban	28,827	11.2	27,705	10.8	56,532
Rural	104,255	40.5	96,527	37.5	200,782
Working Status of Mother					
No	17,284	38.5	16,429	36.6	33,713
Yes	5,923	13.2	5,273	11.7	11,196
Total	23,207	51.7	23,207	48.3	44,909
Mobility - Autonomy					
No	14,723	32.8	13,968	31.1	28,691
Yes	8,484	18.9	7,734	17.2	16,218
Total	23,207	51.7	21,702	48.3	44,909
Mobility - Finance					
No	801	10.4	805	10.5	1,606
Yes	3,255	42.4	2,816	36.7	6,071
Total	4,056	52.8	3,621	47.2	7,677

Table 2.1 : Summary Statistics: Controls

Sex of the First-Born Child					
Wealth Index					
Poorest	41,301	16.1	38,046	14.8	79,347
Poorer	32,576	12.7	29,964	11.6	62,540
Middle	24,598	9.6	23,422	9.1	48,020
Richer	19,558	7.6	18,135	7.0	37,693
Richest	15,049	5.8	14,665	5.7	29,714
Total	133,082	51.7	124,232	48.3	257,314
Highest Education Level					
No Education	51,209	19.9	46,291	18.0	97,500
Primary	20,040	7.8	18,374	7.1	38,414
Secondary	52,154	20.3	49,890	19.4	102,044
Higher	9,679	3.8	9,677	3.8	19,356
Total	133,082	51.7	124,232	48.3	257,314
Sex of the Household Head					
Male	117,344	45.6	109,228	42.4	226,572
Female	15,738	6.1	15,004	5.8	30,742
Total	133,082	51.7	124,232	48.3	257,314
Working Status of Partner					
Not Working	1,238	2.8	1,194	2.7	2,432
Working	21,956	48.9	20,487	45.7	42,443
Total	23,194	51.7	21,681	48.3	44,875

Table 2.2 : Summary Statistics: Controls

Variable	Obs	Mean	Std. Dev.	Min	Max
Age Gap in Yrs (Father – Mother)					
Female First-Born	103,428	4.907	4.447	-33	75
Male First-Born	112,380	4.907	4.461	-33	75

Table 2.3 : Summary Statistics : Controls

Domestic Violence due to Child Neglect					
No	16,258	36.2	15,156	33.7	31,414
Yes	6,949	15.5	6,546	14.6	13,495
Total	23,207	51.7	21,702	48.3	44,909
Religion					
Hindu	92,653	36.0	84,240	32.7	176,893
Muslim	23,287	9.1	23,258	9.0	46,545
Christian	12,133	4.7	12,075	4.7	24,208
Other	5,009	1.9	4,659	1.8	9,668
Total	133,082	51.7	124,232	48.3	257,314
Belongs to Marginalized Communities					
No	22,623	9.2	21,159	8.6	43,782
Yes	105,171	42.6	98,023	39.7	203,194
Total	133,082	51.7	124,232	48.3	257,314
Child is Stunted					
No	88,542	34.4	81,097	31.5	169,639
Yes	44,540	17.3	43,135	16.8	87,675
Total	133,082	51.7	124,232	48.3	257,314
Fully Immunized					
No	120,320	46.8	112,528	43.7	232,848
Yes	12,762	5.0	11,704	4.5	24,466
Total	133,082	51.7	124,232	48.3	257,314

Type of residence

11.2% of total mothers in this sample live in urban areas with first-born females. 10.8% of mothers live in urban areas with first-born males. 40.5% of mothers live in rural areas with first-born females.

Mothers worked in the last 12 months

38.5% of mothers in the sample having first-born daughters haven't worked in the last 12 months, while 13.2% of mothers having first-born daughters have worked in the last 12 months. 36.6% of mothers (out of the total) having first-born sons haven't worked in the last 12 months, while 11.7% of mothers having first-born sons have worked in the last 12 months.

Mobility Autonomy

32.8% of mothers with first-born daughters and 31.1% having first-born sons do not have mobility autonomy, while 18.9% of mothers having first-born daughters and 17.2% of mothers having first-born sons have mobility autonomy.

Financial Autonomy

10.4% of mothers having first-born daughters and 10.5% having first-born sons do not have financial autonomy, while 42.4% of mothers having first-born daughters and 36.7% of mothers having first-born sons have financial autonomy.

5. RESULTS & ROBUSTNESS CHECKS

Referring to *Table 3*, Columns (1) through (3) run the regressions given by equations (A) (B) and (C) respectively discussed in the empirical strategy section for the rural sample, and columns (4) through (6) run the regressions for urban sample. Row (1) across the table shows the beta coefficient corresponding to when the first-born child is a male.

Table 3 : Final Results including Controls

	Final Results					
	(1)	(2)	(3)	(4)	(5)	(6)
		Rural Areas			Urban Areas	
	FLP of Mother	Mobility Autonomy	Financial Autonomy	FLP of Mother	Mobility Autonomy	Financial Autonomy
Sex of First-Born Child - Male	-0.0134***	-0.00407	-0.0246**	0.00801	-0.0255***	-0.0308
	(0.00478)	(0.00506)	(0.0104)	(0.00728)	(0.00948)	(0.0189)
Wealth Index						
Poor	-0.0522***	-0.0444***	0.0338**	-0.0190	0.0349	0.0177
	(0.00660)	(0.00679)	(0.0141)	(0.0216)	(0.0243)	(0.0407)
Middle	-0.0987***	-0.0407***	0.0160	-0.0787***	-0.00620	-0.159***
	(0.00756)	(0.00811)	(0.0189)	(0.0205)	(0.0238)	(0.0470)
Richer	-0.161***	-0.0167	0.0254	-0.0688***	-0.00800	0.0229
	(0.00914)	(0.0102)	(0.0253)	(0.0204)	(0.0236)	(0.0417)
Richest	-0.157***	0.00312	0.0603**	-0.113***	0.0152	-0.0224
	(0.0116)	(0.0134)	(0.0305)	(0.0211)	(0.0249)	(0.0461)
Educational Level						
Primary	-0.0428***	-0.0127	0.0314**	-0.0358**	-0.0346*	0.0487
	(0.00752)	(0.00784)	(0.0157)	(0.0144)	(0.0180)	(0.0340)
Secondary	-0.0686***	-0.0209***	0.0537***	-0.0572***	-0.0264*	-0.0139
	(0.00642)	(0.00674)	(0.0146)	(0.0118)	(0.0151)	(0.0330)
Higher	0.0274**	0.0792***	0.0913***	0.0416***	0.0780***	0.0605
	(0.0124)	(0.0136)	(0.0240)	(0.0156)	(0.0200)	(0.0384)

	(1)	(2)	(3)	(4)	(5)	(6)
Female Household Head	-0.00410	0.105***	0.00380	-0.0163	0.0307**	0.0727***
	(0.00701)	(0.00789)	(0.0155)	(0.0109)	(0.0145)	(0.0246)
Partner Working	0.0193*	-0.00967	0.0128	-0.0372**	0.00539	0.0261
	(0.0109)	(0.0120)	(0.0258)	(0.0159)	(0.0188)	(0.0361)
Domestic Violence due to Child Neglect	0.0423***	0.00195	-0.0154	0.0273***	-0.0440***	-0.0642***
	(0.00545)	(0.00565)	(0.0117)	(0.00940)	(0.0117)	(0.0244)
Religion						
Muslim	-0.0485***	-0.0588***	-0.0976***	-0.0140	-0.0635***	-0.0908***
	(0.00717)	(0.00826)	(0.0222)	(0.00906)	(0.0121)	(0.0286)
Christian	0.0736***	0.0511***	-0.00209	0.135***	0.127***	0.00824
	(0.0154)	(0.0159)	(0.0237)	(0.0294)	(0.0308)	(0.0444)
Other	0.0312*	0.0476***	-0.0298	0.0211	0.0248	0.105**
	(0.0162)	(0.0169)	(0.0263)	(0.0237)	(0.0294)	(0.0417)
Marginalized status	0.0265***	0.00637	-0.0447**	0.0243***	-0.0284**	-0.0164
	(0.00642)	(0.00765)	(0.0182)	(0.00869)	(0.0125)	(0.0261)
Age Gap	-0.00241***	0.00103*	0.00599***	-0.000592	-0.00151	0.000761
	(0.000526)	(0.000557)	(0.00105)	(0.00101)	(0.00120)	(0.00198)
Child Stunting	0.0255***	-0.00257	-0.0211*	0.0185**	0.0109	0.00533
	(0.00514)	(0.00537)	(0.0110)	(0.00847)	(0.0109)	(0.0227)
Immunization Status	0.0333***	0.0134	0.0339**	0.0254*	0.00902	0.0639**
	(0.00827)	(0.00850)	(0.0159)	(0.0138)	(0.0175)	(0.0267)
_cons	0.268***	-0.0255	0.767***	0.134***	0.0954**	0.798***
	(0.0845)	(0.0596)	(0.0372)	(0.0319)	(0.0411)	(0.0681)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
N	32479	32479	6099	9817	9817	1380
adj. R^2	0.082	0.085	0.058	0.047	0.091	0.123

Rural Areas

Mother's Labour Force Participation

The FLFP of the mother (or the probability of the mother having worked in the last 12 months) decreases by 1.34 percentage points when the first-born child is a son relative to when it's a daughter. This coefficient is significant at the 1% level of significance and is consistent with the results from Ichino et. al., 2014. As earlier discussed, we can observe the income effect in the labour force participation trends of mothers in rural areas. We can see that relative to the poorest households, as the income of the family increases, the probability of the mother has worked in the last 12 months decreases further when she has a son in comparison to when she births a daughter. Additionally, we see that as the education level of the mother increases, she is more likely to work (Abdulloev et. al, 2014). Relative to dominant caste mothers, the FLFP of mothers from historically marginalised communities is higher which is consistent with the results from Deshpande & Singh, 2021.

Mother's autonomy over her mobility & finance

The probability of the mother having autonomy over her mobility (where and when she goes) decreases by 0.4 percentage points when the first-born child is a son relative to a daughter. However, this coefficient is statistically insignificant. We can see that relative to the below primary level of education, mobility autonomy is the highest at higher levels of education, and the mother is more likely to have autonomy over her mobility when the household head is a female. The probability of the mother having complete autonomy over decisions regarding how to use her salary decreases by 2.4 percentage points when the first-born child is a son relative to a daughter. Relative to the poorest household, as the income of the family increases, the likelihood of the mother having autonomy over her finances increases as well. Financial autonomy further increases at higher levels of education.

Urban Areas

Mother's Labour Force Participation

In urban areas, the FLFP of the mother increases by 0.8 percentage points when the first-born child is a son relative to a daughter.[4] However, this result is statistically insignificant. Further, relative to the poorest household, the female labour force participation decreases as the income of the family increases. This is consistent with existing literature on the female labour force participation trends in urban areas where females in wealthier households are less likely to participate in the labour force (Deshpande & Singh, 2021).

Mother's autonomy over her mobility and finances

Similar to the rural areas, we find that in urban areas the probability of a mother's autonomy over her mobility decreases by 2.55 percentage points when the first-born child is a son relative to a daughter. This coefficient is statistically significant at the 1% level of significance. Likelihood of a mothers' autonomy over their mobility is greater at higher levels of education, and it decreases by 4.4 percentage points when the respondent justifies domestic violence due to child neglect (significant at 1% level of significance). However, when the household head is a female, the likelihood of the mother having autonomy over her mobility increases by 3.07 percentage points.

The probability of a mother having financial autonomy over decisions regarding how to spend her earnings (either through LFP or other sources of income) decreases by 3.08 percentage points when the first-born child is a son relative to a daughter (statistically insignificant).

The impact of having a first-born son relative to a first-born daughter on the FLFP,

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[4] Previous research shows that after a male child's birth, the mother would have more possibilities to join (back) the workforce as having a male child first reduces fertility (Dahl and Moretti, 2008). When the mother births a first-born daughter, she would be expected to have more children thus increasing the time spent in pregnancies and reducing the mother's labour supply (Jayachandran and Kuziemko, 2011, Chun and Oh, 2002). Thus, while this coefficient is not consistent with our hypothesis, it is consistent with previous research which again highlights the preference for sons in families.

mobility autonomy and financial autonomy of the mother is negative for both rural and urban areas (with the exception of FLFP increasing in urban areas when the first-born child is a son). Even though some coefficients are statistically insignificant, the negative sign of the coefficients is consistent with our hypothesis that the mother is being expected to "compensate" for the birth of a female child by having to work. Moreover, if the firstborn is a male, she is expected to stay at home and take care of and bring up a healthy male child.

Robustness Check

To check the robustness of our results, we consider the regression equation A with two additional controls: the sex of the second-born child (which equals 1 when the sex of the born child is a male and 0 when female) and abortions (which equals 1 if the mother has had any abortions and 0 otherwise) to control for sex-selective abortions and births. The sample now considers mothers who have given birth to their first two children in the last three years. The primary reasoning behind this is that given that sex-selective abortions take place for the second-born onwards. Hence, we expand the analysis to see if the effect still holds when taking into account siblings and see if this effect still persists.

Table 4 : Robustness Check - Additional Controls

	Robustness Check			
	(1)	(2)	(3)	(4)
	Rural Areas		Urban Areas	
	FLP of the Mother	FLP of the Mother	FLP of the Mother	FLP of the Mother
Sex of First-Born Child - Male	-0.0191*	-0.0372	-0.0119	-0.000426
	(0.00989)	(0.0380)	(0.0166)	(0.0353)
Sex of Second-Born Child - Male		0.102**		0.00307
		(0.0457)		(0.0572)
Abortions		0.115**		0.142**
		(0.0555)		(0.0584)
cons	0.243***	0.159	0.257***	-0.359**
	(0.0320)	(0.125)	(0.0700)	(0.174)
Controls from Final Table Included	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
N	6869	516	1567	163
adj. R^2	0.066	0.184	0.112	0.711

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

From *Table 4*, Columns (1) and (3) show the baseline regression A with controls for rural and urban areas respectively. In rural areas, when the first-born child is a son, the mother's FLFP decreases relative to when she has a first-born daughter (significant at 10% level). This decrease is observed in urban areas as well. Columns (2) and (4) include additional controls such as the sex of the second-born child and abortion dummy. We observe that the FLFP of the mother decreases i.e. the sign remains consistent in both urban and rural areas even now. While the latter three coefficients that we have discussed are statistically insignificant, the negative sign of the coefficients shows that our hypothesis that that the mother is being expected to "compensate" for the birth of a female child by having to work, holds here.

6. CONCLUSION

The phenomenon of dropping FLFP could be associated with socio-economic factors or a friction between supply and demand forces (Deshpande & Singh, 2021) or even rural-urban transitions (Neff et. al, 2012). We focus on understanding the impacts of fertility; more specifically the differential impacts of the sex of the first-born child. The hypothesis is built on the notion that patrilineal and patrilocal families would prefer sons over daughters and the added pressure of having a first-born as a male impacts the mother's autonomy and FLFP. We find that if the sex of the first-born is a male, the FLFP and autonomy (both mobility and financial) decrease relative to a female being the first-born. The results have also remained robust when taking into account possible sex-selective abortions and the sex of the second-born child as well.

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