

Role of India's Economic Development in Determining Sex Ratio (at Birth)

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ABSTRACT

This study attempts to understand whether the phenomenon of high economic growth, which created a favorable effect on sex ratio in China and South Korea, will affect the second most populated country on earth, India, in a similar way and would be able to address the gap in sex ratio, the number of females per 100 males. It uses the nationally representative data of 41,554 observations, which were directly collected from households. The study finds that with a declining fertility, a slightly large proportion of parents ensure to have son in their second off-spring in case if they had daughter as their first child. However, regression analysis suggests negative odds of the preference for male child or probability of giving birth to a son if parents get an option to stay with the daughter in their old age. Therefore, under present circumstances, it is not clear whether high economic growth in India has created favorable changes; nonetheless, there are indications that if the country will create more employment opportunities and ensure property rights for the female population, it will lead to a change in gender-discriminatory behavior.

Keywords: Sex Ratio, Progression Rate, Socioeconomic Development, Census, Family Composition

1. INTRODUCTION

India introduced economic reforms in 1991. In addition to unleashing the potential of the country to achieve high economic growth, these reforms have also led to several social changes.

These changes are multidimensional in nature, for example, altering the traditional caste-based, hierarchical structure to redefine the role of women in society.

However, historically, the country is a patriarchal society in which women face systematic discrimination in their wider spectrum of life. This discrimination is prevalent even before a baby girl registers her presence in the world. The prenatal sex selection, targeting specifically female fetus, is widely prevalent in India (Jha et. al., 2011). The phenomenon to discriminate against the girl fetus using advanced technology (ie, ultrasonography), which started in 1980s, is not limited to South Asia

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in countries such as India and Nepal; of note, this practice is rife in East Asian countries such as China, South Korea, and Vietnam; in South Caucasus in countries such as Georgia, Armenia, and Azerbaijan; and in the Western Balkans in Albania, Montenegro, Kosovo, etc. In the past 20 years, the number of countries facing the practices of sex-selective abortion and/or female infanticide grew to 19 (Rahm, 2020).

The wider availability of technology has profoundly affected the way parents realize their desire for a son. Parents can learn in advance the sex of their fetus and may decide to interrupt a pregnancy accordingly. Sex-selective abortions, targeting specifically female fetuses, have ultimately led to long-term demographic imbalances measured through skewed sex ratio at birth (SRB) (UNFPA, 2012).

Nonetheless, the past decades of high economic growth, particularly in Asia, followed by economic development, have led to striking positive social changes. In a study conducted in 2007, Chung et al. explained that the continuous high economic growth in South Korea acted as an impetus to other social advancement and that led to a decline in the SRB from 116 in 1991 to 106 male births per 100 female births in 2009. A similar kind of study conducted in China while controlling the other covariates identified a nonlinear relationship in which SRB initially increases and then decreases according to the socioeconomic status (SES) (Guilmoto and Ren, 2011). Furthermore, in India, the current process of economic development shows signs of change, which could be observed through more employment opportunities for women, their participation in decision making, and the right of inheritance, which in turn have led to the reversal of high sex ratio (Larsen et al., 2013). The government has endeavored to formulate and implement various housing policies and programs at different times. One of these policies was the construction of condominium housing. The effort to build low-cost condominium houses that are affordable for low-income residents through the government's large-scale Integrated Housing Development Program is an experience that deserves close examination. In this regard, while the construction of the condominium houses was at a marginal cost, it seems that many low-

income urban residents cannot afford to own these houses (MoUDHC, 2014). The implication from these statements is that the housing policies have passed through a series of successes and failures. What is least disputable, however, is that there have been slight improvements in almost all the social and physical infrastructure—including the housing sector—of the country. It is necessary to recognize the most important factors behind the poor performance of the housing sector and the determinants of homeownership. Not enough work has been done recently to identify the major determinants of homeownership. The scant literature that is available on the determinants of homeownership in Ethiopia motivated this study. In view of these facts, this study aims to examine the determinants of homeownership among the condominium housing residents of Ambo. It also investigated the overall status of the housing sites in terms of accessibility and availability of the infrastructural services.

2. Rationale of the Study

India has a diverse culture, which is influenced by its population size: it is the second largest country after China in terms of population and seventh largest in terms of its geographical area. Considering the size, India has always been of interest to researchers for examining its social trends. The increasing trend of sex ratio of the country and its contributing factors and long-term effects on the society have been thoroughly examined (Retherford et al., 2003; Bhat et al., 2005; Attané and Guilmoto, 2007; Jha et al., 2011; Guo et al., 2013). Analysis has also been conducted to compare these trends with trends observed in other countries in East Asia and Central Asia (Croll, 2000; Guilmoto, 2009; Rahm, 2020; Tafuro and Guilmoto, 2020). However, there is a dearth of studies that explore the effect of economic development on the sex ratio (Chung et al., 2007; Guilmoto and Ren, 2011).

Although a few studies have been conducted to examine the role of economic development on the sex ratio in India, but their scope is limited to specific geography (Chahnazarian, 1988; Larsen et al, 2013). This study is the first of its kind to use nationally representative data of 41,554 observations directly collected from households to

examine the effect of economic development on the sex ratio. This study tests an association between the variables that characterized and captured the process of economic development and the SRB in 2005. This period is defined as the period when India started reaping the fruits of economic growth. This study may help to broaden the understanding that prohibition of technology was not enough to produce the desired outcome. Therefore, at the policy level, mechanisms should be introduced to transfuse the effect of economic development into social changes.

3. Structure of the Study

After setting the context in the first part of the study, in the second part, the reasons to conduct this study are explained briefly. The third part provides a theoretical background and discusses the previous works. The fourth part discusses a hypothesis and also provides a reason to use SRB as an indicator to measure the practice of prenatal sex selection. In the fifth part, the study describes the data and methodology used. In the sixth part, the study briefly highlights the limitations of the study. In seventh part, results and the discussion about the results are provided. The study then concludes with a discussion of policy implications, followed by appendices.

4. Literature Review

The “logic of industrialism,” which was developed by Kerr et al. (1964), explains that advanced industrial societies increasingly become similar in social structure and gradually lose their eccentric characteristics. Although the idea of economic and technological imperatives that flow from advanced levels of industrialization is not new, it was explicitly stated in the earlier work of Marx and Veblen (1914). In the contemporary world, the resemblance can be drawn in South Korea, where the economic progress since 1980s led to social advancement and a decline in sex ratio to 106 males per 100 females in 2009 from the earlier higher level of 116 males (Chung et al., 2007). The same hypothesis of industrial advancement paves a way to lose idiosyncratic characteristics tested in other settings, such as China, showing a trend to follow the similar path where the SRB initially increases and then decreases with the SES of the household

(Guilmoto and Ren, 2011) as the country was able to maintain high income growth that created better economic prospects and fulfilled the labor demand and supply gap by creating equal opportunities for women.

Microeconomic analysis of the SES of the household identifies channels to determine the sex outcome. Initially, the privileged groups had been found to be more likely to have higher proportion of male births, but that was linked to higher fatal mortality (Teitelbaum and Mantel, 1971; Chahnazarian, 1988). However, the recent literature mainly describes three factors: easy access to technology, preference for sons, and low fertility pressure (John et al., 2008; Guilmoto, 2009). Access to technology establishes a positive link, and the education and the income levels are the determining factors for access to technology. Moreover, low fertility may increase the need for sex selection as the possibility of remaining sonless rises among smaller families. Therefore, there may be a possible association between improved individual SES higher SRB levels.

The association between SES and the proportion of male births examined in other Asian countries has also been frequently found to be positive. Unit-level data from China indicate that SES quintile and SRB are positively related. The indicators of high income status are positively related with gender discrimination in India. The descriptive analysis conducted by Siddhanta et al. (2003) using the National Sample Survey found that expenditure level and sex ratio are positively related.

However, previously lower female status in household has been observed to change among the urban middle classes because of better education, more employment opportunities, and a higher degree of autonomy in society. As a result, the existence of biased gender norms and attitudes are anticipated to weaken with social and economic modernization. This trend represents possibly one of the few ways by which higher socioeconomic development and individual SES indicators could distinctly lower birth masculinity (Guilmoto and Ren, 2011).

5. Statement of the Problem

Using the unit-level information, this study tests whether economic development will lead to a change in gender-discriminatory behavior.

Of note, SRB is considered a robust indicator of masculinization of society, and consistent increase in SRB has been measured to identify other disturbances in social structure — specifically marriage squeezes and domestic violence in affected countries (Croll, 2000; Attané and Guilмото, 2007). This study uses SRB to measure gender-discriminatory behavior.

6. Data Information and Methodology

The prominent feature of this study is the uniqueness of the data set. A survey, named as the Indian Human Development Survey (IHDS) was conducted in 2004-05 by the University of Maryland and the National Council of Applied Economic Research. The survey collected the information from approximately 42,000 households distributed across 28 states and seven union territories. The data were collected using a predesigned questionnaire, which included a vast set of questions on income, expenditure, employment, education, and health. To collect the information on income, expenditure, and employment, investigators were trained to fill the questionnaire based on the responses from the head of the household. In more than 95% of cases, the head of the household was a male member of the family, whereas in the case of questions on education and health, investigator had asked questions from the female member of the household, and in most cases, the female member was an ever-married women aged between 15 and 49 years.

The survey is freely available in the public domain and can be accessed from the following website: www.icpsr.umich.edu. The data are recognized by various international agencies, policy makers, and academicians. State-wise sample size distribution is provided in Appendix 1.

7. Limitations of the Study

Because the survey was conducted in 2005, the data do not capture the recent trends; however, it can be

justified that the change in household behavior is not a momentary phenomenon, and it changes in the long term only. Data capture 15 years of economic development, which is a reasonably long period to test the aforementioned hypothesis. Notwithstanding, there is an argument that the data were collected at a point of time, and therefore, data would not be able to identify channels that may be responsible to determine gender-biased behavior of parents. However, to measure that, a longitudinal survey is needed, which future research may consider to explore.

8. Results and Discussion

Sex Ratio at Birth in India

The increase in SRB observed in India is generally linked to a combination of three factors: a continuing desire to have a son, a decline in fertility, and the rapid spread of sex determination technologies (John et al., 2008; Guilмото, 2009). Moreover, several studies that computed SRB reported that SRB started to increase in the late 1980s, reached 107 in 1991, and 108 between 2000 and 2005 (various rounds of the Vital Registration Survey). A high level of SRB (111) was reported in 2006-07 using the District Level Household Survey, and since then, there has been little change in SRB, which was 110 according to the official estimate in 2009-11.

A well-known characteristic of SRB is that it varies among the states and in socioreligious groups and by economic status and parity (Zhen et al., 2013; Hu et al., 2011). The parity effect stems from the fact that gender discrimination is usually negligible for first birth, but increases for later births (Figure 1; To see the birth order and family composition by rural and urban India, refer to Appendix: 2). The 2011 Census data also indicate that there are substantial differences among states: few

states in northern India such as Punjab and Haryana have a very high sex ratio, whereas most states in southern India have a favorable sex ratio, such as Kerala and Tamil Nadu, with their sex ratio being as favorable as that of developed countries. Table 1 shows the

variation from the national average (Census is conducted once in a decade and does not report SRB; therefore, the study reports sex ratio for ages 0 to 6 years to show the pattern.). The 2011 Census data also indicate a decline in the rate of increase in sex ratio in ages 0 to 6 years.

Table 1: Trends in India's 0-6 sex ratios by state, 1981-2011

Regions and states	0-6 sex ratio (male/female)				% change		
	1981	1991	2001	2011	1981-1991	1991-2001	2001-2011
India	1.04	1.06	1.08	1.09	1.73	1.98	1.39
North West							
Haryana	1.11	1.14	1.22	1.21	2.61	7.29	-1.31
Himanchal Pradesh	1.03	1.05	1.12	1.10	2.14	6.08	-1.08
Punjab	1.10	1.14	1.25	1.18	3.81	9.62	-5.67
*Chandigarh Union Territory	1.10	1.11	1.18	1.15	0.82	6.38	-2.54
*Delhi Union Territory	1.08	1.09	1.15	1.15	1.20	5.40	0.09
Jammu and Kashmir	1.04	n.a.	1.06	1.06	n.a.	n.a.	9.50
West							
Rajasthan	1.05	1.09	1.10	1.13	4.20	0.73	3.00
Gujarat	1.06	1.08	1.13	1.13	2.08	5.10	-0.35
Maharashtra	1.05	1.06	1.10	1.13	1.05	3.60	3.47
Goa	1.04	1.04	1.07	1.09	0.10	2.80	1.97
North Central							
Uttarakhand	-	1.05	1.10	1.13	-	4.46	2.54
Uttar Pradesh	1.07	1.08	1.09	1.11	0.84	1.20	1.83
Madhya Pradesh	1.02	1.06	1.07	1.10	3.81	0.94	2.14
Regions with child sex ratio similar to (or moderately above) the United Nations average of 1.05 for 2010							
East							
Bihar	1.02	1.05	1.06	1.07	1.24	0.94	1.24
Jharkhand	-	1.02	1.04	1.06	1.47	2.32	1.47
Chhattisgarh	-	1.02	1.03	1.04	0.98	1.07	0.98
Orissa	1.01	1.03	1.05	1.07	1.45	2.10	1.45
West Bengal	1.02	1.03	1.04	1.05	0.77	1.06	0.77
South							
Kerala	1.03	1.04	1.04	1.04	-0.19	0.00	-0.19
Karnataka	1.03	1.04	1.06	1.06	1.44	0.28	1.44
Tamil Nadu	1.03	1.06	1.06	1.06	0.66	-0.47	0.66
Andhra Pradesh	1.01	1.03	1.04	1.06	1.46	1.83	1.46
North East							
Assam	n.a.	1.03	1.04	1.05	0.97	0.87	0.97
Arunachal Pradesh	1.00	1.02	1.04	1.04	1.87	0.48	1.87
Meghalaya	1.01	1.01	1.03	1.03	1.38	0.29	1.38

Manipur	1.01	1.03	1.05	1.07	1.75	2.49	1.75
Nagaland	1.01	1.01	1.04	1.06	2.98	2.12	2.98
Sikkim	1.02	1.04	1.04	1.06	0.19	2.02	0.19
Tripura	1.03	1.03	1.04	1.05	0.10	1.35	0.10
Mizoram	1.01	1.03	1.04	1.03	0.48	-0.77	0.48

Bold and italic show a lower rate of increase during 2001-2011 than 1991-2001. The negative sign shows a decrease. The United Nations 2010 estimate shows that the average child sex ratio was 1.05 for less developed regions (excluding China)

*Delhi and Chandigarh are metropolitan cities that constitute separate administrative units (union territories). Because they are the only cities for which data are available, they are shown here. **The 2011 data for Jammu and Kashmir are very dubious, as acknowledged by the Census report, and discussed in the text. It has been a difficult state to hold a Census, given its political situation.

Source: Adapted from a study, "Missing Girls" in China and India: trends and policy impacts, 2013

Birth Order and the Family Composition

The SRB by birth order and its gender composition usually display a clear picture that sheds light on the prevalence of gender-biased behavior and the existence of effective prenatal sex selection practices. Birth order reflects the family's preference, which in turn determines the family composition. The first birth often shows a somewhat regular proportion of boys and girls, whereas SRB among higher-order births tends to be skewed. It results from the behavior of parents to correct their family composition in view of the children already born.

A precise measurement of family formation processes is based on the calculation of the parity progression ratio (PPR), which is the probability that parents with a given number of children will bear an additional child. The PPR can be computed from the birth distribution among women with completed fertility. Therefore, for this analysis, data for women who have completed the age of 39 years was used; however, there was a small proportion of women who reported pregnancy after that age.

First, the overall PPR for all births was 98.5% for the first birth, meaning that 98.5% of all women gave birth to at least one child. Another 1.5% women did not give birth because of several other medical and social reasons. The all-India figure was compared with that of Punjab and Haryana, which

is 99.1%. In case of Punjab and Haryana, SRB is persistently reported to be higher than that of the other states. The PPR was again high for the second birth (91%), but it decreased to 61% and 35%, for the third and fourth order of birth, respectively. Punjab and Haryana combined have a higher proportion than the national average in the second and third birth order, whereas the fourth order is below than the national average. These numbers can be similarly read as the proportion of women with two or three children already have gone for an additional third (or fourth) birth. They represent the overall fertility levels among Indian women of the older generations, for whom this calculation is possible. Analysis has also been conducted for rural and urban India separately (Appendix 1). Expectedly, the PPR is lower in urban India than in rural India. For the third birth, it reached 52.1%, and for the fourth birth, it declined to 26.7% in urban India.

To understand the sex preference further, this study, which classified women into women without son(s) and women with son(s), yields ratios that now depend on the attained gender composition of the family. Here, it can be seen that women without sons tend to have an additional birth more often than other women (93.2% compared with 91.6% who had a son in first birth). However, there is another explanation also that a single child is uncommon, and approximately 91% of women plan for a second child regardless of the gender of the

first one. The difference in PPR is most apparent in case of third birth. Only 60.2% women with two sons in the first and second birth planned for the third birth, whereas this proportion is 22.4% higher in case of women with two consecutive girls in first and second birth who then planned for third birth.

To understand the dynamics of whether there is any sex selection in the second and third birth order, classification was made among the women who had a son or daughter in first birth and had planned for second birth, and other factors were analyzed such as (1) in the second birth what proportion of women had given birth to a son or daughter if they already had a son in the first birth, and (2) what proportion had given birth to a son or daughter if they had a daughter in the first birth. It could be assumed that the proportion of women who had a son in first birth generally would not have a strong desire for getting another son in second birth. Therefore, this proportion could be considered as standard to compare with the other proportions. Evidence says that generally more boys are born than girls in any setting all across the world (105 boys per 100 girls). The lower ration is considered as a sampling error and the higher than the standard ratio is considered by demographers as sex selection. Women who had a son in the first birth and had again given birth to a son in the second birth have a proportion of 51.4%, whereas up to 53.2% of women had a daughter in the first birth. This ratio is alarmingly high in Punjab and Haryana, that is, 52.4%, and 59.0%, respectively. In India, parents use the sex selection technology to determine the preferable

composition of the family. Because this technology is easily accessible in urban areas, this ratio is 54.1%, which is higher than the ratio of 52.8% in rural areas.

This tendency is strident and more pronounced among women who had daughters in their first and second birth: ratio increased to 55% in India overall, and 64.2% in Punjab and Haryana. The chances of sex selection are high in this cohort. It is also evident that the proportion is highest for those women who plan a third pregnancy if they had a daughter as their first and second child (82.6%), whereas this ratio is 60.2%, 64.1%, and 63%, respectively, for those women who gave birth to a boy in previous two pregnancies, first boy and second girl, and first girl and second boy, respectively. Of note, this ratio is the highest in Punjab and Haryana, with 91.9% of women who gave birth to daughters in the previous two pregnancies planning for third pregnancy.

There has been a decline in the fertility rate, and in light of wide accessibility of technology, it has become easier for parents to decide the preferable size of the family. This sex selection is more prevalent in specific settings, such as Punjab and Haryana. However, these data are slightly outdated to enable selection of the women who have completed their fertility and therefore do not capture the recent trends. Moreover, simple proportion is unable to determine the behavior of household toward sex. Thus, to capture this phenomenon, regression analysis was conducted.

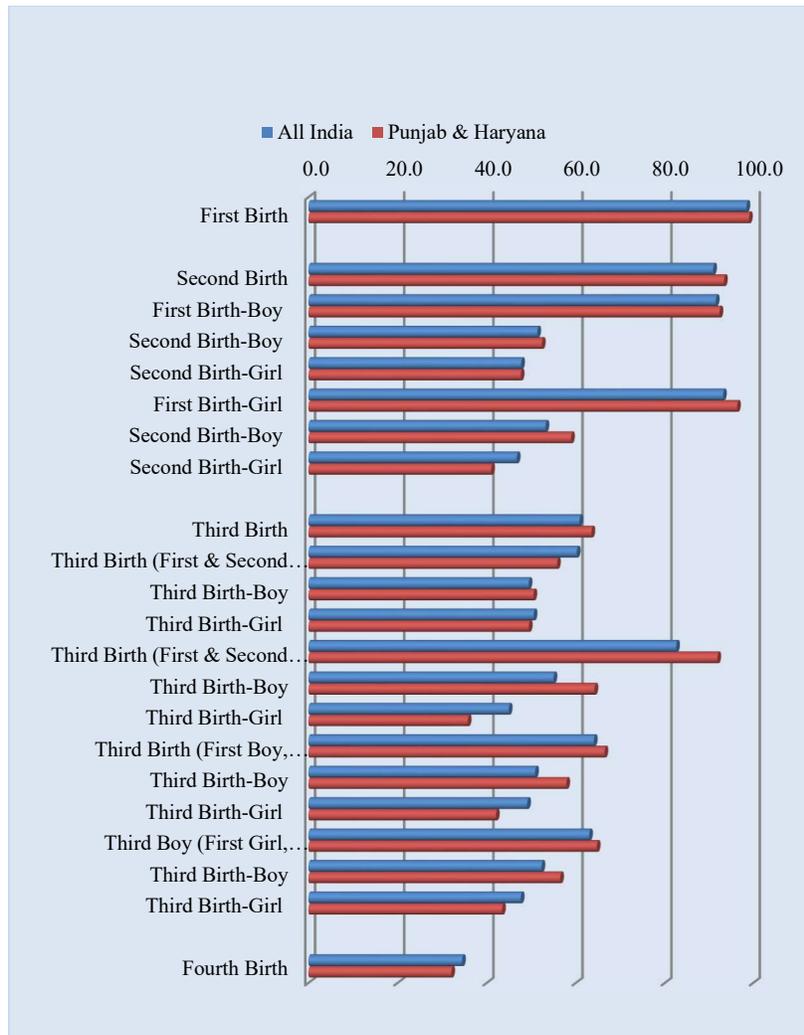


Figure 1. Birth order and family composition, 2004-05

Source: Prepared by the authors using the IHDS Survey, 2005

Variables Identification and Determinants of Sex Ratio at Birth

The objective of analyzing SRB is to capture a trend of recent socioeconomic development. The number of male and female infants who are younger than 1 year was identified using the individual file in which the information of approximately 2 million individual members was given. Together, 3084 male and female members were identified to be younger than 1 year. Indicators related with other characteristics of the household were shortlisted using the household and women questionnaires. In case of the household questionnaire, the information on income, expenditure, occupation,

asset holding social network, and media exposure was collected from the head of the household, who was a male member in most households. However, information related to health, education, fertility history, and customs was collected from the eligible women of the household, who were aged between 15 and 49 years. In case of almost all the households, household and women information was collected from the same household.

Variables were identified by reviewing data from the recent literature on gender. SRB was selected as a prime variable, and regression analysis was used to estimate the probability of male birth. A similar

kind of analysis was conducted previously by Bhat et al. (2005). The drawback of this method is that the probability of male birth is only marginally affected by socioeconomic causes. The main factor in the determination of sex of an individual birth remains chiefly random, and the contribution of sex selection practices to the overall variance of birth masculinity is modest because most parents do not practice sex selection. However, the prime objective to use this technique was to identify covariates in the form of socioeconomic characteristics of the society, which are of significance for the SRB.

After selecting the variables for household characteristics, such as economic status and ethnicity, other variables were selected that represent societal change and create more opportunity for women to participate in decision making (for detailed descriptions of variables and the corresponding observations, refer to Appendix 3). The selected variables for analysis in the recent literature are viewed as the indicators that will capture the societal change (Larsen et al., 2013). Any positive sign may influence to change the sex-biased behavior in the long run.

A study conducted in China by Guilmoto and Ren (2011) reported that because of decadal economic development, SRB in China has shown a modest sign to change the gender-biased behavior. To measure this relationship, they used SRB and SES of the household. After four decades of sex selection and the positive relationship with income status, the study reported a favorable and significant change. The study identified that higher income status negatively affects the probability of giving birth to a son. The magnitude of the coefficient gets enlarged as a household moves from lower to upper SES compared with the middle SES. The level of significance also increases with the improved income status. However, on the contrary an analysis which has been explored by the authors using the National Family Health Survey (NFHS)-III for the 2005-06 reported the reverse trend in case of India. Though, despite the coherent findings, this study did not find any significant relationship. Moreover, to further examine and to understand whether the trend of economic development could undermine the cultural barrier, a direct question was asked to household that, "in last 10 years, do you see any

change in the economic condition of your house?" and three options were given: worse, same, and better. Considering worse as a category to be excluded, the study found a positive relationship with the SRB, although the results were not significant. Therefore, it can be concluded that in India despite a positive relationship between income status and SRB, income status does not influence the sex ratio.

There are studies that have reported sex ratio is higher among specific ethnic groups such as high-caste Hindus, Sikhs, and Jains, whereas Muslims and Other Minorities have a normal sex ratio. This study included socioreligious variables in the model and found that compared with other backward class Hindus, a positive relationship exists between SRB and high-caste Hindu, the relationship has also been found positive between SRB and Scheduled Castes-Hindu and Scheduled Tribes-Hindu, but the relationship is not significant. Although a negative relationship was found between SRB and being Muslims and Other Minorities, but again, the relationship is not significant. Of note, a positive relationship was found between SRB and being Sikhs and Jains, at a small significant level. Thus, with the exception of the Sikhs and Jains, socioreligious group variable does not significantly influence the sex ratio (refer to Table 2).

Conventionally in Indian cultural, there are set of norms, defining that women will perform household chores, and men will participate in labor market and will be breadwinners. Owing to this perception, women participation in labor force was meagerly low. However, the past decade of economic development has generated opportunities for women to participate in labor market and challenged the existing cultural norms. Increased participation by women in labor market in urban settings in particular has encouraged several other women to participate. These changes are visible in the form of increased proportion of women in tertiary and secondary education. The participation of women in the labor force encourages other women to join the labor market, thereby helping change the perception about the patriarchal structure of society. A question was asked to ascertain if any female member in the household or family was a doctor, principal, teacher, or an officer and above. This variable did not indicate

significance, but this could probably be due to the possibility of small proportion in the sample.

A nonlinear relationship exists between women and media exposure. No significance was noted in SRB for women who watch television daily compared with those who do not watch television at all. Daily exposure with media affects the awareness level, which has a negative influence on the odds of preference for a male child and giving birth to a boy. However, no exposure with media indicates a possible economic deprivation of the household, because in this era of globalization, if they do not have a television or are not exposed to other forms of media, how will they be aware of sex determination techniques? Therefore, women's media exposure shows a significant negative correlation with the SRB.

Furthermore, the following factors were found not to have a significant influence on SRB: whether women choose their husband on their own or get married to someone chosen by their parents, the practice of using a veil in front of elders in the household or family, and ownership of assets.

On the question to probe women's independence in the household, questions had been asked about her visit to market/restaurant with husband, and her visit to neighborhood without seeking a permission from the elders. Having visit the market with husband and without seeking permission from the elders to visit neighborhood found having negatively related with the odd of having a male birth, and also without seeking a permission from the elders to visit neighborhood is found to have significant influence.

Other than the cultural norms, the presence of a son in the household is considered as a security to parents in their old age. Parents usually stay with the son, and staying with the daughter is not socially acceptable in Indian society. For parents, even drinking water at the daughter's place after marriage is considered as a violation of social norms. However, during the analysis, the model incorporated a variable about old age stay. There were four options: son only, daughter only, son and daughter both, and nobody. In case of nobody there could be a possibility of having no children, therefore this category was not the part of our analysis. A very high proportion of couples considered son as the only option (64.2%). However, considering daughter only, and considering 'daughter and son both', has been found having a negative affect on the odd of giving birth to a male kid. An option to stay with the daughter or 'son and daughter both' has also been found highly significant with the scope of having type-I error 1% only. It can be concluded that a very slight change in this norm may change the tenuous affection for having a son in Indian society (Larsen et al., 2013).

The past decade of economic growth has brought other changes in Indian society too, especially in urban areas; for example, crime against women has increased exponentially. A variable 'incidence of women harassment' included in the analysis. Though the variable does not show a significant sign with the odd of giving birth to a male kid, but certainly it has showed the 'incidence of women harrassment' is positively related with odd of giving birth to a male kid.

Table 2: Determinates of sex ratio at birth (correlates of birth masculinity)

Number of observations						3084
LR chi2(25)						213.4
Prob > chi2						0.000
Pseudo R2						0.050
Sex ratio at birth: 0 female, 1 male (dependent variable)	Coef.	Std. Err.	z	P>z	95% CI, lower limit	95% CI, upper limit
Independent variables						
Income level; Q1 (excluded category)						
Q2	0.06	0.09	0.650	.514	-0.117	0.233
Q3	0.08	0.11	0.730	.466	-0.134	0.293

Socioreligious group; Hindus/Other Backward Classes (excluded category)						
High-caste Hindus	0.08	0.11	0.700	.483	-0.137	0.289
Hindu/Scheduled Castes	0.13	0.11	1.260	.208	-0.075	0.342
Hindu/Scheduled Tribes	0.16	0.15	1.090	.274	-0.129	0.456
Muslims	-0.04	0.12	-0.360	.716	-0.277	0.190
Sikhs and Jains	0.42*	0.25	1.700	.090	-0.065	0.906
Other Minorities	-0.14	0.28	-0.510	.610	-0.695	0.408
Household economic condition; worse (excluded category)						
Same	0.16	0.12	1.320	.188	-0.077	0.394
Better	0.15	0.12	1.240	.214	-0.088	0.391
Social network; no (excluded category)						
Yes	0.27	0.29	0.940	.349	-0.297	0.840
Women media exposure; sometimes (excluded category)						
Never	-0.23*	0.10	-2.270	.023	-0.427	-0.031
Regularly	-0.17*	0.10	-1.680	.093	-0.367	0.028
Parents and other relatives with respondent view (excluded category)						
Parents and other relatives: without respondent view	0.01	0.09	0.070	.946	-0.163	0.175
Respondent herself	0.16	0.20	0.800	.426	-0.227	0.538
Veiling face; yes (excluded category)						
No	0.03	0.09	0.350	.728	-0.141	0.203
No such practice	0.78	0.41	1.900	.058	-0.025	1.586
Outing with husband; no (excluded category)						
Yes	-0.06	0.08	-0.800	.423	-0.222	0.093
Permission to village neighborhood; yes (excluded category)						
No	-0.20*	0.11	-1.890	.058	-0.409	0.007
Ownership or rental papers; no (excluded category)						
Yes	0.05	0.13	0.400	.690	-0.202	0.305
Do not have papers	-0.03	0.19	-0.150	.878	-0.396	0.338
Old age stay; son (excluded category)						
Daughter	-2.72***	0.40	-6.760	.000	-3.506	-1.931
Son and daughter both	-0.96***	0.09	-10.840	.000	-1.132	-0.785
None/other	-1.07**	0.36	-3.020	.003	-1.771	-0.378
Women harassment; no (excluded category)						
Yes	0.14	0.12	1.240	.214	-0.083	0.369

Source: Prepared by the authors

9. Conclusion

On the basis of these findings, the study concludes that the stable and high economic growth that was found to be an impetus to positive change in the sex ratio in China and South Korea has not created similar effects in India, initially in half decade of moderately high economic growth in the 21st century. In the existing patriarchal structure in India, the necessary presence of a son in the household is not only linked with economic

security; it is indeed a culture norm. Therefore, despite the rapid decline in fertility, a slightly large proportion of households maintain the perfect composition of the family, wherein the household ensures the birth of a son in the second birth order if the household had a daughter in the first birth order. This affection for the son is notably prominent in certain parts of India, Punjab and Haryana, and in socioreligious groups, Sikhs and Jains. Being from the Sikh and Jain socioreligious

group had a significantly positive influence on SRB.

Nonetheless, the study reveals a positive sign that an option to stay with the daughter at old age changes the perception of necessarily having a son. The variable has a significantly negative relationship with the odd of giving birth to a son. This can be implicitly associated with the economic independence of women, and the opportunities for women to participate in labor market. Hence, the steady high economic growth in the long term may lead to favorable sex ratio in India as has been observed in case of China and South Korea.

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Table AI.1 Statewise Distribution of IHDS Sample

	District in 2001 Census	Included in IHDS				Households Surveyed			Individuals Surveyed		
		Districts	Urban Areas	Blocks	Villages	Rural	Urban	Total	Rural	Urban	Total
Jammu and Kashmir	14	5	5	21	20	400	315	715	2,528	1,702	4,230
Himachal Pradesh	12	9	7	21	52	1,057	315	1,372	5,663	1,503	7,166
Punjab	17	13	11	36	61	1,033	560	1,593	6,202	2,831	9,033
Chandigarh	1	1	1	6	0	0	90	90	0	383	383
Uttaranchal	13	6	3	9	20	309	149	458	1,757	736	2,493
Haryana	19	14	6	18	79	1,350	268	1,618	8,112	1,291	9,403
Delhi	9	10	7	56	6	60	900	960	329	4,291	4,620
Rajasthan	32	23	17	60	88	1,590	895	2,485	9,663	4,805	14,468
Uttar Pradesh	70	43	24	75	138	2,389	1,123	3,512	14,966	6,499	21,465
Bihar	37	17	10	31	61	965	465	1,430	5,950	2,856	8,806
Sikkim	4	1	1	3	3	60	45	105	293	212	505
Arunachal Pradesh	13	1	1	3	6	120	45	165	623	209	832
Nagaland	8	4	1	2	5	100	30	130	480	84	564
Manipur	9	3	1	3	3	60	45	105	359	239	598
Mizoram	8	1	1	3	3	60	45	105	263	239	502
Tripura	4	2	1	3	7	184	45	229	818	190	1,008
Meghalaya	7	3	1	3	6	116	45	161	505	250	755
Assam	23	8	7	21	38	699	318	1,017	3,286	1,404	4,690
West Bengal	18	14	21	75	66	1,247	1,133	2,380	6,170	4,788	10,958
Jharkhand	18	6	9	27	26	519	405	924	2,913	2,095	5,008
Orissa	30	26	13	40	84	1,464	600	2,064	7,710	2,886	10,596
Chhattisgarh	16	15	6	18	49	905	270	1,175	4,833	1,377	6,210
Madhya Pradesh	45	31	13	42	121	2,177	628	2,805	12,392	3,409	15,801
Gujarat	25	17	14	60	70	1,167	911	2,078	5,926	4,234	10,160
Diw and Daman	2	2	0	0	3	60	0	60	281	0	281
Dadra and Nagar Haveli	1	1	0	0	3	60	0	60	315	0	315
Maharashtra	35	27	18	75	115	2,078	1,125	3,203	10,881	5,721	16,602
Andhra Pradesh	23	19	18	60	94	1,526	909	2,435	6,669	3,992	10,661
Karnataka	27	26	21	78	144	2,832	1,189	4,021	14,184	5,675	19,859
Goa	2	2	1	3	6	100	65	165	475	307	782
Lakshadweep	1	0	0	0	0	0	0	0	0	0	0
Kerala	14	12	14	42	61	1,089	642	1,731	4,892	3,089	7,981
Tamil Nadu	30	21	22	74	62	898	1,200	2,098	3,691	4,855	8,546
Pondicherry	4	1	1	3	3	60	45	105	245	228	473
Andaman and Nicobar	2	0	0	0	0	0	0	0	0	0	0
Total	593	384	276	971	1503	26,734	14,820	41,554	1,43,374	72,380	2,15,754

Source: Adapted from the report Human Development in India: Challenges for a Society in Transition