# Measuring Gender Bias

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**Abstract**

This paper proposes a simple measure of gender bias through quantifying differential stopping behaviour by parents. There have been very few theoretical attempts towards the measurement of such bias but we believe that there is a strong need for economic insights and inferences in this area. In this paper, we have purpose-built a measure to facilitate this. Unlike other attempts, this measure uses only observed data on the distribution of children and not stated preferences. Looking at the age and sex of the sequence of offspring, we aim to capture the male bias of parents. We also identify possible household characteristics that effect this, using NSSO data from Tamilnadu, India.

**Keywords:** Gender bias, Differential stopping behaviour, Optimization, Causality

**JEL Classification:** J16

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# I Introduction

It has been well documented in the economics and sociological literature that parents exhibit preference for sons across geographical, economic and social boundaries. Adult sons are expected to provide economic support and hence having more sons is always desirable (Das 1984, Lahiri 1984, Miller 1987, ORG 1983). On the other hand daughters are supposed to create an economic burden for the parents in terms of dowry etc. As a consequence, parents desire a high proportion of sons. In this paper, we look at the parents' decision problem at the procreation stage rather than about household budget allocation decisions where the daughters are discriminated against in terms of expenditure on health and education. A large literature has arisen dealing with this issue. See Rose, 1999, Dutta and Panda, 2000, Chakrabarty, 2000, Schultz, 2001 and the references cited therein for some recent investigations along this line.

While this preference is generic, as it is not possible for the parents to pre-determine the sex of their unborn children, realizing an ideal outcome is not possible directly. But there are indirect methods by which the parents can improve the proportion of sons among their children. The most common ones that have been documented in the literature are the following.

(1) Better health care for sons affects the sex composition of surviving children, Bardhan (1974,1982) etc. But, surprisingly, this does not effect the sex ratio at the national level. The sex ratio at birth (boy per girl, surviving children) varies between 1.02 and 1.14 across regions and over a long time period for India. This is also true for most western countries (Waldron, 1983, 87). Recent research on genetics show that, at the family level, there is no bias towards either sex (Rodgers, 1997). Thus, for demographic purposes, the sex of any given child may be considered a random event with the probability of having a boy being 0.513 (sex ratio = 1.05). In this paper, for simplicity, we take this probability to be ½. This does not bias our measure significantly.

(2) Sex selective abortion ( Park and Cho 1995, Yi, Liao and Cho 1997). This involves use of simple chemical tests to determine the sex of an unborn child. Sex selective abortion has not yet become such a significant factor in determining the sex ratio in India (Arnold, 1997; Dasgupta and Bhat, 1995; Nair, 1996). Although the data on stillbirths is very difficult to get for Indian families, we may safely assume that this will not affect our analysis in any significant manner.

(3) Differential stopping behaviour (DSB). Parents stop having children when they have enough (in absolute or relative terms) sons : Amin and Mariam (1987), Arnold (1997), Arnold and Zhaoxiang (1986) De Silva (1993), Rahman et. al. (1992), Sarma and Jain (1994).

As a consequence of the above, we have the following broad observations that have been supported by data.

(i) Families with a large number of children will have a large proportion of daughters (Park and Cho 1995)) and (ii) for a given family size, socioeconomic characteristics of couples who *want* a higher proportion of sons will be the same as those who *have* a higher proportion.

In this paper, we focus on the third method of achieving a better proportion of sons by the parents, namely **differential stopping behaviour (DSB).** Our aim here is to measure the extent of DSB that the parents practice at the family level. This is arguably a difficult task. The exact stopping rule followed by a couple depends on both *magnitude* (desired proportion) and *intensity*

( how determined they are to have their desired number of sons). Coupled with that we have the problem of collecting data on stillbirths (usual surveys record only surviving children). There have been very few earlier attempts at developing a theory towards the measurement of son preference (Ben-Porath and Welch (1976), Davies and Zhang (1997)).

There have been some empirical attempts at this measurement problem. Coombs 1979, Coombs, Coombs and McClelland 1975, Coombs and Sun 1978, Kwan and Lee 1976, Widmer, McClelland and Nickerson 1981 are a few of the recent papers in this area. Recently, Clark (2000) attempted a very extensive analysis using survey data for India asking each couple their actual and ideal proportion or number of sons. She shows that ideal figures are related to Age of mother, Education, Caste, Residence (rural/ urban), Religion and geographic region. Her analysis relies on sex ratios (proportions) of the stated and actual figures.

This paper hypothesizes a simple measure of (male) gender bias based on an idea akin to DSB. This measure uses only observed data on the distribution of children (not stated ideals, which is suspect in any context). In particular, it uses the actual (age, sex) composition of children in a family. In the second section we formulate the procreation decision by parents as a dynamic utility maximization problem and hence show that changes in the sex ratio are more important than the actual proportions. That is, a couple's further procreation decision is affected more by a favourable or adverse change in the sex ratio than the actual value of the ratio. We discuss this in greater detail in Remark 1 below.

We go on to suggest a simple measure that captures these changes. The simplification we have achieved for our measure relies on certain assumptions that are somewhat restrictive. But our justification for doing so lies in the fact that otherwise the problem would be too complex to capture using a simple functional form. Very few empirical studies exist, focussing on the distribution of children, due to the lack of such simplified measures. We believe that there exists a strong need for economic insights and inferences in this area. Here, we have purpose-built a measure that facilitate this. Another implicit justification would be if our measure throws up plausible inferences, which it indeed does (see Sections 3 and 4 below).

A complete characterization of such a measure on the basis of plausible behavioral axioms would have been very rewarding, but we have not attempted this in the present paper.

In section 3, we have carried out an illustrative empirical exercise estimating family level gender bias using NSSO 50$^{th}$ round data from Tamilnadu, a state of India. The pattern of gender bias in the state is illustrated. We then relate our measure to some socioeconomic variables that are likely to effect the attitude of the parents towards the children's sex. The results are presented in section 4. The last section offers some concluding remarks.

## II Motivation and Methodology

We first sketch our model of male bias for parents. In the ensuing discussion, we will always assume that any future child is a male with probability ½. To develop notation, we consider our data or primitive to be the vector of children in a family with *k* children: ( $c_1, c_2 \ldots c_k$ ), where $c_i = 1$ (0) if child is male (female). The vector is ordered according to age. That is, the sex of the eldest child is recorded in $c_1$ and so on.

We assume that the parents face a dynamic problem of optimal stopping time in terms of utility maximization. Let $p_k = \frac{1}{k}\sum_{i=1}^{k} c_i$ be the proportion of male children in the family when the family has *k* children. Let the utility of the parents be a function of the number of children *n*, along with the proportion of male, $p_n$. Thus, the parents' utility function is given by $u = u(n, p_n)$.
After the k$^{th}$ procreation, the utility of the parents is given by $u(k, p_k)$. If they attempt again, the expected utility will be given by: $Eu_{k+1} = \frac{1}{2}u(k+1, \frac{k}{k+1}p_k + \frac{1}{k+1}) + \frac{1}{2}u(k+1, \frac{k}{k+1}p_k)$.
So the parents will try again at k if $Eu_{k+1} > u(k, p_k)$.

We assume the following regarding the shape of the utility function:

**A1**: $\frac{\Delta u}{\Delta k} < 0$ for $k \geq k_0$, that is utility is decreasing in k, the number of children, after some critical number $k_0$. In other words, the parents may, at first, like having more children, when they have only a few. However, after some stage, additional children are undesirable per se, the only motivation for further procreation is having additional sons. This assumption is very reasonable in terms of affordability (in terms of both resource and time) and the urge for continuation of lineage. The critical number, $k_0$, may depend on many socioeconomic factors like biological supply children (fecundity), social location, income, size of the family etc.

**A2:** (a) $\frac{\Delta u}{\Delta p_k}$ >0: (for parents who are male biased) and

(b) $\frac{\Delta u}{\Delta p_k}$ <0: (for parents who are female biased).

The above assumption is easily seen to imply the following.

**Remark 1:** A one-time increase in $p_k$ would discourage parents with high male bias to try again (if they are beyond $k_0$).

**Proof:** The requirement of $k > k_0$ is due to the fact that for $k \leq k_0$, simply adding to the number of children is utility augmenting. In this situation, expected utility may be unambiguously increasing and hence, in that range, our proposition may not hold.

By high male bias we imply that $\frac{\Delta u}{\Delta p_k}$ is a large positive number. Now, given $p_k$, the gain potential from another procreation, through improvement of $p_k$, is $\frac{1-p_k}{k+1}$ and the loss potential is $\frac{p_k}{k+1}$. That is, overall benefit potential decreases if there is a favourable change in $p_k$. Given that expected utility is now decreasing in *k*, for a couple with high male bias after experiencing an increase in $p_k$, it becomes more likely that they will value the status quo $u(k, p_k)$ more than the expected utility,

$$Eu_{k+1} = \frac{1}{2}u(k+1, \frac{k}{k+1}p_k + \frac{1}{k+1}) + \frac{1}{2}u(k+1, \frac{k}{k+1}p_k).$$

**Remark 2:** The stopping time or the maximum number of attempts by the parents will be finite.

**Proof:** As $k \to \infty$, $\frac{1}{k+1} \to 0$, so $Eu_{k+1} \approx u(k+1, p_k) < u(k, p_k)$ for $k \geq k_0$.

We now postulate a reasonable quantification of male bias. In general, the measure of bias is B = B ( $c_1, c_2 \ldots c_k$ ). We now take recourse to the following simplifications.

We can reasonably assume that the measure B will depend on the total number of children and the stopping state or the sex of the last child ($c_k$). Also the total number of children, k, helps to get the measure in a ratio form (dimension free number). $c_k$ captures the stopping state which is important in the sense that it reflects what you want at the end ( may be waiting for this to happen).

From Remark 1, it is intuitively clear that a male (female) biased couple would be encouraged to continue procreation if there is a favourable change in the direction of movement of the quantity $p_k$. That is, an increase (decrease) after a sequence of decreases (increases). Again, this is equivalent to the occurrence of a male or 1 (female or 0) after a series of 0's (1's). These occurrences can be tracked if we count the occurrence of the pairs {01} or {10} in the vector ($c_1, c_2 \ldots c_k$ ). For this we use the notation $k_{01}$ = number of {0,1} pairs and $k_{10}$= number of {1,0} pairs in ($c_1, .., c_k$). Thus, we postulate the following.

$k_{10}$ ($k_{01}$) captures attitude to risk exposure revealed through another attempt of procreation even after a detoriation (improvement) in the ratio.

Once achieving $\{0,1\}$, if one attempts again, we assume that it indicates less male bias,

Similarly, we take it that for $\{1,0\}$, similar behaviour implies more male bias.

These behavioral assumptions in turn implicitly suggest that the underlying utility function might exhibit convexity in the $p_k$ term. This is at variance with the usual concavity assumption on utility functions but given the nature of the variable, this is not implausible.

Note that we are ignoring the effect of infant mortality on our utility maximization problem. An additional child may be demanded to replace a dead child. Given that female births are systematically underreported in many developing countries like India (Rose, 1999 and many others) and female infanticide is not rare; the implication of this simplification for our measure is that, in expected terms, we are underestimating the value of $k_{10}$ and hence gender bias. A solution to this problem increases our data requirement. For our present discussion, we are ignoring this component.

We now take it that our measure of bias depends on only the factors that we have discussed so far. That is, we simplify the measure to the form B = B(k, $c_k$, $k_{10}$, $k_{01}$).

Now, as we have said that the presence of k (the number of children) as an argument of the bias function is solely to make it a dimension free pure number. Hence, given that the maximum value of $k_{01}$ and $k_{10}$ can be $\lfloor k/2 \rfloor$, we simplify the measure of bias to B = $B\left(c_k, \frac{k_{01}}{\lfloor k/2 \rfloor}, \frac{k_{10}}{\lfloor k/2 \rfloor}\right)$, where B is decreasing (increasing) in the second (third) argument.

We now go for a further simplification to two directional components, one in terms of {0,1} switches (female direction) and one with {1,0} (male direction). This will help us in our empirical exercise later. We assume that the marginal effect of $k_{01}$ on the measure of bias B is independent of the value of $k_{10}$ and vice versa. More precisely, we are assuming

**A3:** $\frac{\Delta^2 B(.)}{\Delta k_{10} \Delta k_{01}} = 0.$

This is analogous to the assumption that $\frac{\partial^2 B(.)}{\partial k_{10} \partial k_{01}} = 0$ in the continuum situation. This kind of assumption imposes a separability restriction on the measure under consideration.

Simple algebra demonstrates that the implication of (A3) is that the measure B becomes additively separable in these two components. That is, we have

$$B = B_M\left(c_k, \frac{k_{10}}{\lfloor k/2 \rfloor}\right) + B_F\left(c_k, \frac{k_{01}}{\lfloor k/2 \rfloor}\right).$$

The impact of $c_k$ is assumed to be in assigning relative weightage to the factors $\frac{k_{10}}{\lfloor k/2 \rfloor}$ and $\frac{k_{01}}{\lfloor k/2 \rfloor}$.
As $c_k$ can only take two possible values (0 or 1) we can, without loss of generality, assume that

$$B_M\left(c_k, \frac{k_{10}}{\lfloor k/2 \rfloor}\right) = G_M\left(\frac{k_{10}}{\lfloor k/2 \rfloor}\right) w_M(c_k) \text{ and } B_F\left(c_k, \frac{k_{01}}{\lfloor k/2 \rfloor}\right) = G_F\left(\frac{k_{01}}{\lfloor k/2 \rfloor}\right) w_F(c_k),$$

where $w_M(c_k) + w_F(c_k) = 1$ (as these are meaningful in the relative sense). From the above discussion, obviously, $G_M$ ($G_F$) is increasing (decreasing) in $k_{10}$ ($k_{01}$) as $k_{10}$ ($k_{01}$) is directly (inversely) related to male bias.

More simply, we can now finally rewrite our measure of bias B as

$$B = G_M\left(\frac{k_{10}}{\lfloor k/2 \rfloor}\right) w(c_k) + G_F\left(\frac{k_{01}}{\lfloor k/2 \rfloor}\right)(1 - w(c_k)). \qquad \text{……..(1)}$$

$w(c_k)$ is the importance attached to $B_M$ with $w(1) + w(0) = 1, w(1) \geq w(0)$. $G_M$ captures the male direction. So, if last child is a male, this gets higher weightage.

Note: This measure works for $k \geq 2$ only (not defined for k=0 and 1). This is not a serious shortcoming as with realized k=0 or 1, a manifestation of bias is not possible.

Finally, to illustrate our concept through a simple functional form, we postulate $B_F = \left\{1 - \frac{k_{01}}{\left[\frac{k}{2}\right]}\right\}\left[1 - w(c_k)\right]$ and $B_M = \frac{k_{10}}{\left[\frac{k}{2}\right]} w(c_k)$

as a simple special case of the general form (1). For the empirical part of our paper, in sections 3 and 4, we will consider this special case only. This is one simple measure that illustrates our idea. $k_{01}$ is inversely related to male bias, so we take $1 - k_{01} / \left[\frac{k}{2}\right]$ as an indicator of male bias. $k_{10}$ is directly related to male bias, so male bias is assumed to be linearly increasing in $k_{10}$.

In our empirical illustration, we have tried $w(1) = 0.9$ (BIAS90) and 0.70 (BIAS70). As B is assumed to be linear in $G_M$ and $G_F$, considering any two distinct values of $w(c_k)$ is sufficient. Using the value of B for these two choices, one can generate a complete family of distributions of B for all permissible values of $w(c_k)$.

**Difference of the measure suggested in (1) with conventional measures:**

This measure does not look at the ratio: $\frac{\sum_{1}^{k} c_i}{k}$, because this has probabilistic components to it. Also intention is better captured by looking at the sequence rather than the final proportions. So we look at shifts in the ratio and corresponding stopping rules.

Eg; sequence {00000001} : B= 0.425 (with $w(1) = 0.70$)

Conventional measure will reveal low male bias (proportion = 0.125).

Note that {1,1} (or {0,0}) also imply improvement (or detoriation) in ratio, but we want to focus on shifts, so we only look at {1,0} or {0,1} pair. One might look at longer strings and study changes of a higher order, but that will complicate the intuition and also lower the number of admissible data points (if we look at strings of length 3, we can only look at data for which $k \geq 3$, etc.)

Finally, we discuss another class of examples about which our measure can not say anything. These are the sequences {00…00} and {11…11}, which, according to subjective judgement, show a large degree of bias. However, for these two sequences, as both $k_{01}$ and $k_{10}$ are equal to 0; the value of the measure will be $w(0)$ or $w(1)$. This causes some indeterminacy in the pattern of bias which we will discuss later. But, it is to be noted that in our setup the generic probability of any future child being male is equal to ½. With this assumption, both the strings are equally likely (for any given size). Hence the values $w(0)$ or $w(1)$ will also occur with equal probability and, in expected terms, the resulting distribution will remain unbiased.

## III A Simple Illustration for the Pattern of Bias

We now illustrate the pattern of male bias distribution among households in rural Tamilnadu, using NSSO 50$^{th}$ round (1993 – 94) data. The sample included 3901 households. From each household, we select the family originating from the head of the household. That is, we consider the children sired by the head. Among these households, the head of 2092 households has 2 or more children. These households were suitable for our exercise and we selected them in our final sample.

Again we have ignored the effect of lack of information on dead children (as discussed earlier) and we also have not considered the case of incomplete families (for which the parents are still of childbearing age and may extend their families further). These are serious problems that will have to be addressed by researchers aiming to look at policy implications via a detailed study of gender bias along these lines. But for our limited illustrative purpose we did not address this issue.

A sample of our analysis is presented below

| ID | k | $c_k$ | k01 | k10 | BIAS70 | BIAS90 | $\underline{c}$ |
|---|---|---|---|---|---|---|---|
| 4204828 | 5 | 1 | 1 | 1 | 0.5 | 0.5 | ***1 0 0 1 1 |
| 4255422 | 5 | 1 | 1 | 1 | 0.5 | 0.5 | ***1 0 1 1 1 |
| 4255825 | 6 | 1 | 2 | 2 | 0.56667 | 0.63333 | ***1 1 0 1 0 1 |
| 4255121 | 6 | 0 | 2 | 2 | 0.433333 | 0.36667 | ***0 1 0 1 0 0 |
| 4221412 | 4 | 1 | 2 | 1 | 0.35 | 0.45 | ***0 1 0 1 |
| 4282812 | 5 | 0 | 1 | 1 | 0.5 | 0.5 | ***0 0 0 1 0 |
| 4282824 | 3 | 1 | 0 | 0 | 0.3 | 0.1 | ***1 1 1 |

**Histograms of BIAS70 and BIAS90:** (attached)

(i) Both the histograms are bi-modal, with two peaks at the extremities.
(ii) There are clear cut classes of the whole sample according to BIAS70.
  (a) indifferent people : lying in the region (0, 0.2) and
  (b) biased people : lying in the region (0.8, 1.0) with a
  (c) sparse middle group.
(iii) For BIAS90 the polarization is less pronounced but still apparent.

When we look at the data from urban Tamilnadu, exactly the same patterns emerge and hence we do not present these results separately.

## IV Household Characteristics Effecting Gender Bias

In order to identify household characteristics that may possibly effect the feeling of bias, we started out with a fairly large set describing the position of the household along social, religious, economic and human capitalistic lines. Variables other than these might also be selected as possible explanatory factors but for our limited purpose of identifying broad determining factors, these are deemed to be sufficient.

**Explanatory variables used:** (following Clark, 2000 and socioeconomic considerations)

Religion dummies for Hinduism, Islam and Christian (DRH, DRI, DRC)

Social group dummies for SC and ST (DSC, DST)
Dummy indicating the education level of head of household : illiterate, just literate, primary, middle school, secondary, higher secondary and above. (DHDEDU)
Dummy indicating the education level of mother : illiterate, just literate, primary, middle school, secondary, higher secondary and above. (DMTHEDU)
Per capita expenditure (PCE)
Household size (HHSIZE)
Number of children in the household (K)
Mother's age (MTHAGE)

We ran regressions on BIAS70 and BIAS90, which were calculated using rural Tamilnadu data. **The results** are as follows:

Social group, per capita expenditure (even in non-linear terms) and mother's age has no effect on male bias. The fact that social group has no effect may be due to growing awareness even in the backward sections of the society. The insignificance of PCE is supported by casual sociological observations that says income really does not matter for this issue, at least for the less industrialized states[1]. Surprisingly, head of household's education level also showed no significant effect on bias. This is surprising at first but from sociological studies we find that procreation decisions are affected more by female rather than by male education. This is not to say that the male parent has less bargaining power is this respect. In fact the converse tends to be true. This only says that the attitude of the male in this respect is unaffected by his level of education. The other variables were all significant.

The religion dummies were all positive and significant which shows that religion has some differential effect on gender bias at least at a weaker level. The positivity of all the dummies is explained by the absence of a constant in our regressions. Household size affects male bias negatively. In a large household, there is positive consumption externality and this may have a mitigating effect on bias against females. The positive sign of the coefficient of number of children in the family is as expected. Parents with a higher bias usually end up with a larger number of children.

The most surprising result of all, is the significant positive relation between mother's education and male bias. This is very counterintuitive because one expects that an educated mother would have less bias for male siblings. A resolution of this problem appears when we look for a possibly non-linear relationship between these two. The motivation being the age-old saying that a little learning is dangerous; in that it increases the mother's preference for a son, as a future wage earner, rather than mitigating it. Education mitigates this bias only after a certain education level has been achieved. To test this hypothesis we included the square of MTHEDU as an explanatory variable in our regression. The coefficient of this term, as expected, turns out to be negative. So mother's education at first increases male bias and then starts reducing it after a stage. In our model, the turning point comes out as the secondary level. The final regression models are enclosed.

Again, when we repeat our exercise for the urban data, household size and number of children shows similar significant effects on bias measures. But, the education level of the mother is no longer important. This is again intuitively reasonable as in urban areas the impact of

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[1] In a separate piece of work, using data from Maharashtra, a highly industrialized state of India, we found that PCE actually effects gender bias adversely. Poorer people want more sons here, possibly in the hope of having more wage earners in the family in future.

education would be diluted due to more uniform adhesion to social norms. Here, instead of educational achievement, mother's age becomes a significant explanatory variable, The implication of this result is not very clear. One possible explanation could be that older mothers have larger numbers of children and hence have more scope of demonstrating their bias.

## V Conclusion

In this paper we have hypothesized a simple measure of son preference by parents as revealed through the age and sex composition of their children. Our measure does not take into account the stated preferences or any other information apart from the realized situation of the distribution of children. The measure looks at how many times the parents have attempted procreation after an increase or decrease in the sex ratio of their children. Our purpose in developing the methodology is to emphasize the lack of theoretical research in this particular direction which, to us, seems to be pregnant with exciting possibilities.

We attempted to illustrate our definition through an empirical exercise using data on Tamilnadu from NSSO, India. The distributions of our bias measures are bimodal showing a polarization of the population into low and high bias segments with a sparse middle region. This is definitely not an agreeable finding, demonstrating a large proportion of the population showing a high bias, but it conforms with sociological observations that people tend to exhibit extreme behaviour with respect to sex bias.

We next tried to identify household characteristics that affect the male bias of parents. It turns out that income status and social group does not affect bias. The education level of the head of household is also insignificant. The important factors turns out to be religion, family size and education level of the mother with male bias exhibiting an interesting non-linear relationship with the last named variable. The policy implication that can be drawn from this is that higher education among rural women should be encouraged.

We did not attempt a complete characterization of our measure in terms of plausible behavioral axioms. Such an exercise would be very interesting and we leave that as a future research project.

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**Regression Results**

**Rural Tamilnadu**

| Dependent Variable: | BIAS70 | | BIAS90 | |
|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Coefficient | t-Statistic |
| DMTHEDU | 0.100747 | 2.169614 | 0.082736 | 1.897551 |
| DMTHEDU^2 | -0.013677 | -2.014840 | -0.011203 | -1.757748 |
| DRC | 0.360959 | 5.785806 | 0.472257 | 8.061810 |
| DRH | 0.349616 | 6.951494 | 0.460634 | 9.754174 |
| DRI | 0.285637 | 3.914096 | 0.431105 | 6.291413 |
| HHSIZE | -0.022777 | -3.353894 | -0.014115 | -2.213427 |
| K | 0.042988 | 3.871953 | 0.014040 | 1.346818 |

| | BIAS70 | BIAS90 |
|---|---|---|
| R-squared | 0.013433 | 0.007008 |
| Adjusted R-squared | 0.010594 | 0.004151 |
| F-statistic | 4.731679 | 2.452520 |
| Prob(F-statistic) | 0.000085 | 0.022919 |
| Log likelihood | -1019.013 | -887.2769 |
| Durbin-Watson stat | 1.990309 | 2.014829 |

**Urban Tamilnadu**

| Dependent Variable: | BIAS70 | | BIAS90 | |
|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Coefficient | t-Statistic |
| HHSIZE | -0.024639 | -3.234670 | -0.016265 | -2.252986 |
| K | 0.055880 | 5.161604 | 0.023984 | 2.337564 |
| MTHAGE | 0.002196 | 2.436326 | 0.002255 | 2.640106 |
| C | 0.343963 | 8.599037 | 0.449578 | 11.85897 |

| | BIAS70 | BIAS90 |
|---|---|---|
| R-squared | 0.014987 | 0.005701 |
| Adjusted R-squared | 0.013643 | 0.004343 |
| F-statistic | 11.14776 | 4.200580 |
| Prob(F-statistic) | 0.000000 | 0.005669 |
| Log likelihood | -1038.186 | -920.0286 |
| Durbin-Watson stat | 2.051302 | 2.051923 |

**Rural Tamilnadu**