

Decomposing geographical variation of declining child sex ratio in Uttar Pradesh

Introduction

Sex ratio is measure of population composition. Generally more males are born and theoretically there are to be equal males and females in a given population. In recent years it is observed that overall sex ratio of the world population is 101 males per 100 females. As per 2011 Indian Census there are 106 males per 100 females. When we look for 0-6 years' population this number is estimated as 109 boys for 100 girls for India. There is a wide variation in sex ratio and child (0-6 years) sex ratio in states and districts of India. Typically the sex ratio is imbalanced and more males are present in more than 90 percent states of India. Uttar Pradesh, most populous state of India, also has this imbalance and this imbalance is worsening with the time. As a result, missing girls has come up as a new demographic challenge for countries experiencing fertility decline. In India, recent Census data suggest despite increase in overall sex ratio, there is decline in child sex ratio. Same is the case with Uttar Pradesh. This study aims at mainly analyzing Census data at the three levels viz. village, development block and district level and identify the geographical areas of concern. This study through its disaggregated analysis will unmask inequalities in child sex ratios in Uttar Pradesh. Census as a prime source on count of population facilitate number of males and females by age. Data released under Primary Census Abstract (PCA) enables community level representation of this phenomenon. This study is to look in to the sex ratio for three census years namely 1991, 2001 and 2011.

Objectives

Main objective of the study is to find sub-state level variations in child sex ratio and to find the areas of concern. The specific objectives are listed as-

1. To study the trends in child sex ratio in Uttar Pradesh
2. To study the village level data for three Censuses points and understand the patterns of child sex ratio over time
3. To identify areas of grave concern by multi-level analysis

Data Source

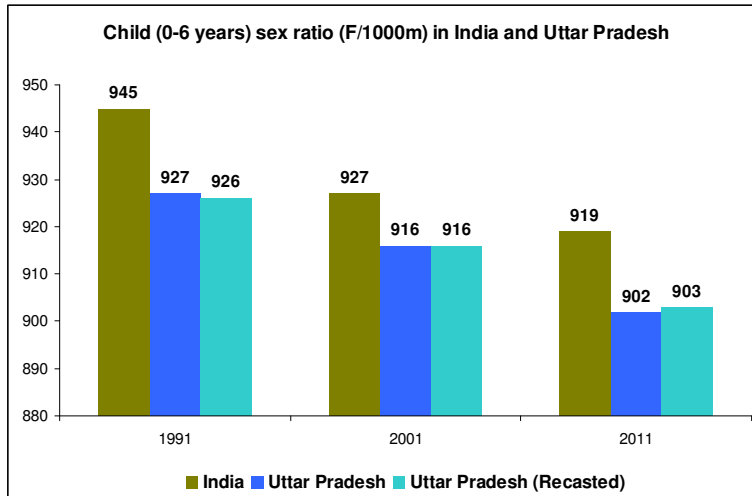
Primary Census Abstract data for 1991, 2001 and 2011 Censuses.

Methods

Recasting of PCA data for 1991 and 2001 has been done on the basis of 2011 Census. Additionally, four newly created districts in Uttar Pradesh have been created in data and analysis has been performed for 75 districts. Likewise backward recasting (based on 2011) of distribution of villages for 821 development blocks has also been done. In rural areas three levels of analysis have been considered namely district, development block and village.

Results

The sex ratio of child population (0-6 years) have declined over the time in India as well as in Uttar Pradesh.

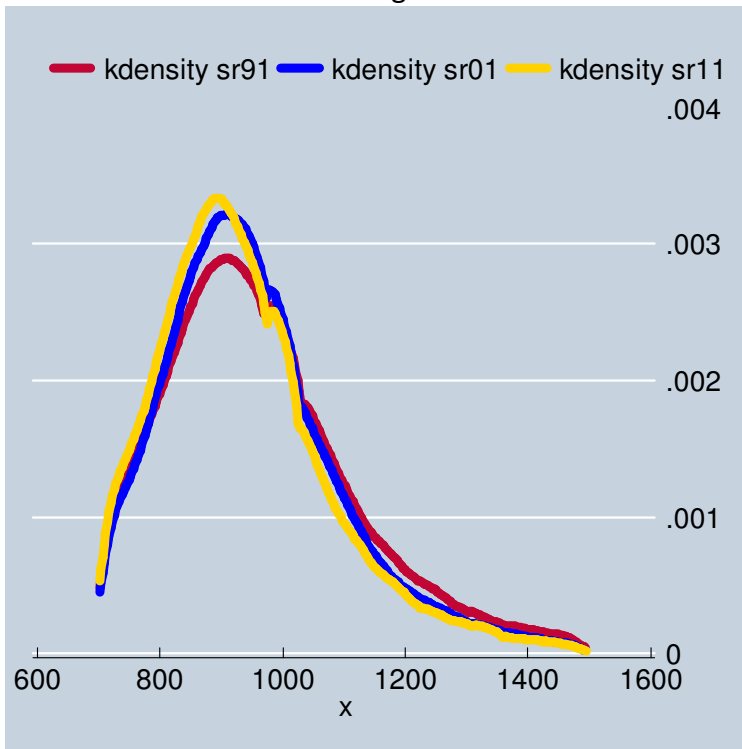


Latest Census 2011 reveal that CSR (child sex ratio) is as low as 902 girls per 1000 boys. There has been 1.2 percent decline during 1991 to 2001 in CSR. While as, an accelerated decline of 1.5 percent was noted during 2001 to 2011. In present study recasting on 2011

Jurisdiction has been performed. In the process of backward matching of villages/towns of 1991 and 2001 some units did not match owing to creation/deletion of some units. In this study of the total population 97.8 percent, 97.4 percent and 97.9 percent for Census years 1991, 2001 and 2011 have matched. Thus child sex ratio for recasted population has also been presented here. The recasted CSR are similar to those reported by Census in respective years.

CSR in 1991, 2001 and 2011

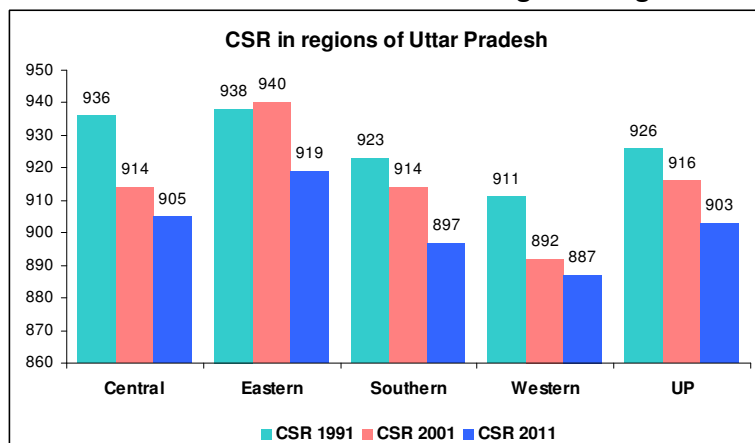
The CSR for each of the villages and town has been computed for 1991, 2001 and



2011 census units. The distribution of units has been presented in Table-1. It is notable that 49 percent units had CSR below 900, which got reduced for 44 percent units in 2001 and further to 43 percent in 2011. There has been decline in percent share of successive categories of CSR. The adjoining density graph of CSR for three decades also present the similar picture. The distribution is shifting towards the left side depicting decline in CSR.

CSR in regions of Uttar Pradesh

There is a wide variation in CSR among four regions of Uttar Pradesh. The highest

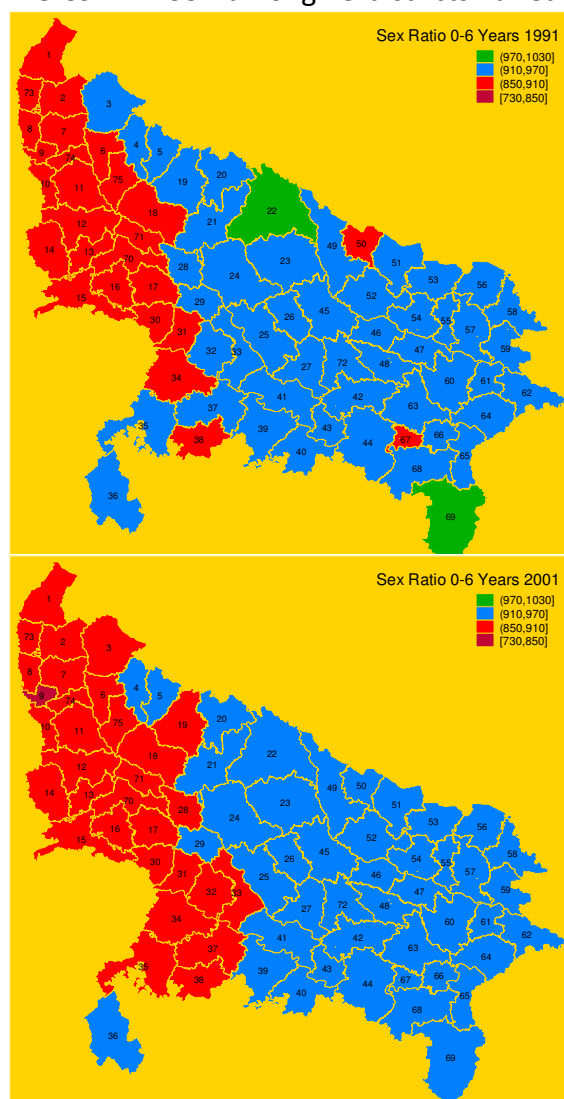


CSR was for Eastern region followed by Central region and Southern region leaving Western region for the last position. The similar position remained in 2001 and 2011. The difference between the highest and lowest CSR is 22 points in 2011. Details of CSR by rural

and urban areas are presented in Table-2.

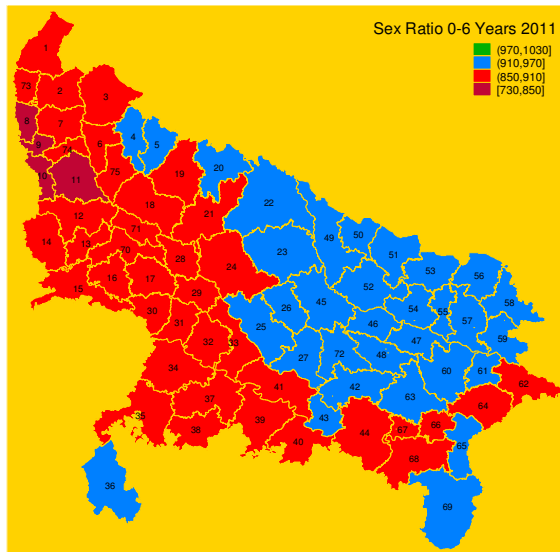
CSR in districts of Uttar Pradesh

The CSR in 1991 among 75 districts varied from 877 to 975. The top five districts as



per CSR were Sonbhadra (975), Kheri (964), Pilibhit (957), Mau (955) and Sitapur (953) and bottom five were Firozabad (877), Baghpat (885), Sambhal (886), Mathura (888) and Etah (889). In 2001 the CSR ranged between 842 and 966. The top featuring districts were Sonbhadra (966), Bahraich (965), Siddharthnagar (965), Balrampur (961) and Mahrajganj (957) and the trailing districts were Ghaziabad (890), Baghpat (850), Shamli (857), Meerut (857) and Gautam Buddha Nagar (858). In 2011 the variation in CSR ranged from 841 to 950. The top districts were Balrampur (950), Sant Kabir Nagar (942), Bahraich (935), Siddharthnagar (935) and Amethi (935) and bottom five were Baghpat (841), Gautam Buddha Nagar (844), Ghaziabad (845), Meerut (852) and Bulandshahr (854). There is a clear demarcation of east and west when top and bottom five districts of the state are counted. Map-1 presents the distribution of 75 districts by CSR for 1991, 2001 and 2011.

There were no district below 850 CSR in 1991, in 2001 one district fell in the category

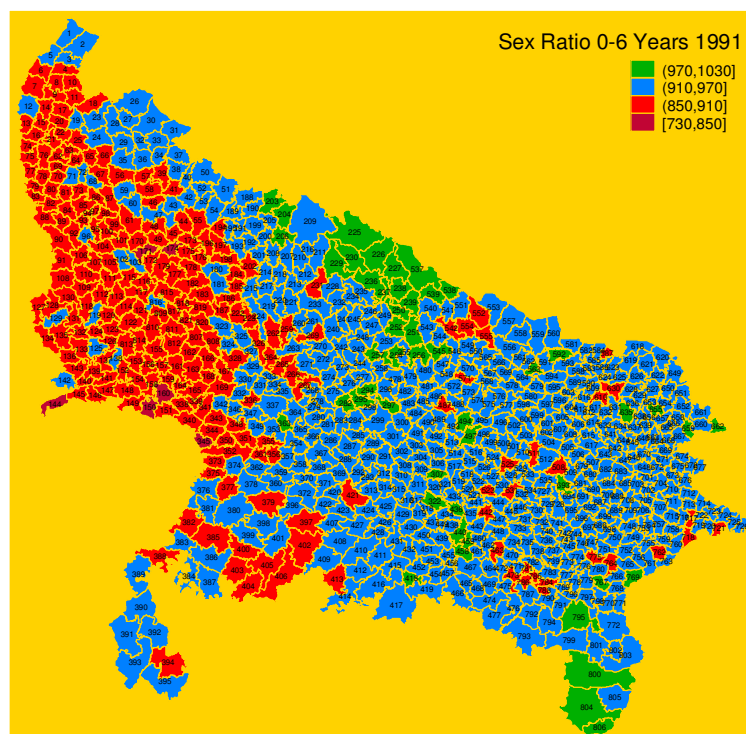


while as by 2011 4 districts had CSR less or equal to 850. Likewise in next category of '850-910' there were 25 districts in 1991 and it rose to 30 in 2001 and 39 in 2011. In the higher category of '910-970' there were 48 districts and it declined to 44 in 2001 and 32 in 2011. There were two districts in 1991 which had CSR more than 970 and subsequent year none were left in this category. Patterns clearly reveal that western districts had low CSRs and Eastern districts had high CSR. Bundelkhand districts were more similar to those of Western districts

while Central region districts more or less featured like Eastern districts. There is a clear East and West divide in as far as CSR in Uttar Pradesh is concerned.

Block level CSR in Uttar Pradesh

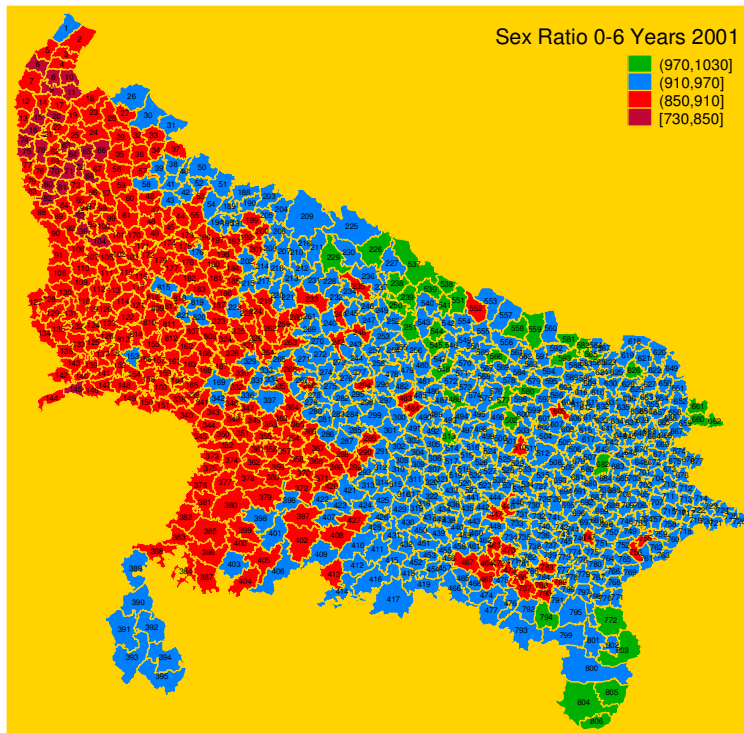
There are 821 blocks in Uttar Pradesh for which the recasted data of CSR has been



generated. In 1991 there were seven blocks with CSR more than 1000; Dhaurehra (Kheri: 1023), Kakwan (Kanpur Nagar: 1022), Nighasan (Kheri: 1019), Isanagar (Kheri: 1011), Bijua (Kheri) (1006), Amaniganj (Faizabad: 1004) and Chopan (Sonbhadra: 1002). The bottom five blocks were Islamnagar (Budaun: 842), Madanpur (Firozabad: 842), Bah (Agra: 842), Jagner (Agra: 842) and Chakarnagar (Etawah:

848). In 2001 the CSRs varied between 799 and 1004. Among top five blocks in 2001 there was only one with CSR value greater than 1000; Mihinpurwa (Bahraich: 1004) followed by Jamunaha (Shrawasti: 999), Shoharatgarh (Siddharthnagar: 991), Isanagar (Kheri: 990) and Dudhahi (Kushinagar: 990). The bottom five blocks were Shamli (Shamli: 799), Nanauta (Saharanpur: 827), Muradnagar (Ghaziabad: 830), Baghara (Muzaffarnagar: 830) and Janikhurd (Meerut: 835). In 2011 the CSR among blocks ranged between 731 and 966. Blocks with highest CSR in 2011 may be listed

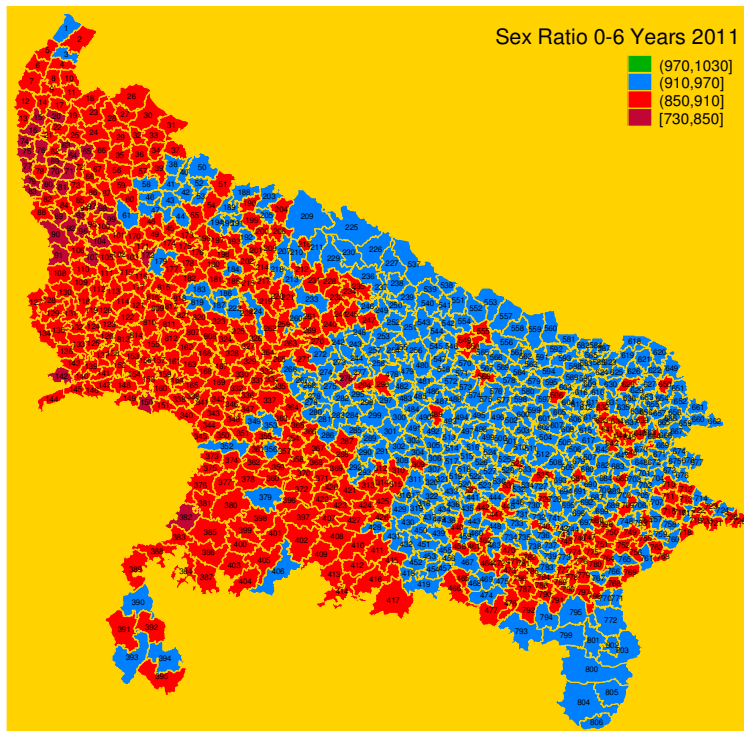
as Dhani (Mahrajganj: 966), Mavai (Faizabad: 965), Isanagar (Kheri: 964),



Semariyawan (Sant Kabir Nagar: 964) and Mihinpurwa (Bahraich: 963) and bottom five blocks were Sandila (Hardoi: 731), Shamli (Shamli: 811), Jewar (Gautam Buddha Nagar: 818), Rohta (Meerut: 820) and Chhaprauli (Baghpat: 821). The maps of block level CSR present a picture more or less in tune to the districts with few variations. There seems a clear East and West demarcation in the patterns of the CSR among the blocks in

2001 which is similar to that of 1991. The names of blocks are represented in serial numbers listed in the appendix-A.

In 1991 there were only six block which had CSR below 850, this rose to 23 blocks in 2001 and 31 in 2011.

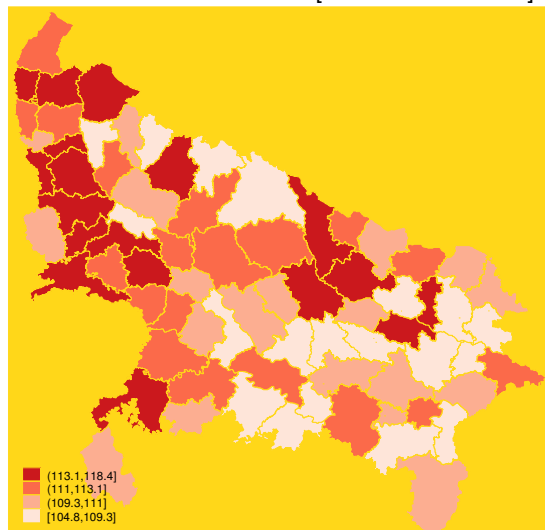


In next category '850-910' the number of blocks increased to 266 in 2001 and 375 in 2011 from 218 in 1991. In next two higher categories the number of block declined from 1991 to 2011. In highest category of '970-1030' there were 56 blocks in 1991 which got reduced to 39 in 2001 and none in 2011 (Table 4). The worsening of sex ratio is prevalent in almost all the regions and districts of the state.

Noteworthy the phenomenon of low CSR is not limited to Western region of the state but it has also swept to the blocks falling in eastern region with time.

Present scenario in sex ratio at birth

The health management information system (HMIS) data has been great source of data on health process indicators. The quality of data has been improving and has reached a satisfactory level on many counts. HMIS items include the number of births of males and females within the health facility jurisdiction. This data has a limitation that number of births reported is mainly from the public health facilities or births at home but tend to capture a fairly sizeable proportion of births in the state. The obtained for the districts of Uttar Pradesh has been pooled for past 3/5 years and average picture of sex ratio at birth has been presented in Table 7.



Ideally the SRB has to be 105 but in Uttar Pradesh in past 6 years average works out to be 111.6. Only four of the districts- Meerut, Bulandshahr, Chitrakoot and Pilibhit had SRB between 104 and 106 remaining all the district had SRB more than 107 and 118. The highest SRB has been observed in Aligarh (118.4), Hamirpur (117.3), Ambedkar Nagar (116.7), Mathura (115.1) and Firozabad (114.8).

Decline in CSR over two decades

At micro level 54 percent of villages experienced a decline in CSR over two decades while as only half a percent maintained a same level and 45.4 percent registered an increase in the CSR. In urban areas more than two thirds units have shown decline in CSR and remaining one third have registered an increase. As far as district level is concerned there are eight districts; Kanshiram Nagar, Moradabad, Firozabad, Ambedkar Nagar, Sant Kabir Nagar, Balrampur, Sambhal and Shrawasti which registered an increase in CSR in two decades and remaining 67 districts experienced decline in CSR in the similar period. Top five districts as far as decline is concerned are Kanpur Nagar (66), Jhansi (53), Meerut (51), Gautam Buddha Nagar (49) and Shamli (48). If considered for the blocks in Uttar Pradesh 163 block registered an increase in the CSR and six remained same in twenty years' time period. There were 652 blocks which have experienced a decline and top five blocks in respect to decline are Sandila (Hardoi: 198), Kakwan (Kanpur Nagar: 126), Kaurihar (Allahabad: 119), Meerut (Meerut: 97) and Jewar (Gautam Buddha Nagar: 91).

As expected the decline in the CSR has not been uniform; the rank correlation (according to population size) for rural areas during 1991-2001 and 2001-2011 pairs of villages was as small as 0.033 and 0.053 but in urban areas for same pairs of towns they were 0.205 and 0.312. If we move up in the level i.e. block level (restricted to rural areas) the rank correlations were 0.673 and 0.760. Similarly for the district level the values of rank correlations are 0.803 and 0.929 for 1991-2001 and 2001-2011 pairs of districts.

Looking through the background characteristics it may be noted that proportion of child population is negatively associated with the decline in CSR in the state. Increase in village/town size to an extent is positively associated with decline in CSR. Urban areas experienced twice as much decline in CSR compared to the rural areas. Proportion SC/ST does not have much bearing on decline in CSR in state. Increase in female literacy is found to be positively associated with the decline in CSR in the state.

Multilevel analysis depicts that most of the variation in CSR is explained at the village level a very small proportion about two percent is explained by district level and less than one percent at the block level.

Table : Regression of change CSR (2011-1991) in Uttar Pradesh

Independent variables	β	SE(β)	t	P>t
Difference in proportion 0-6 year population (2011-1991)	-0.369	0.075	-4.95	0.000
diff_rat_~91	2.45	0.262	9.35	0.000
CSR 1991	-0.978	0.003	-345.72	0.000
Female literacy 1991	-0.78	0.069	-11.31	0.000
Ratio of 0-6 population in 1991	2.491	0.319	7.8	0.000
Sector (indicator) Urban (Rural suppressed)	4.741	8.694	0.55	0.586
Size of village/ town (indicator: size class 1 '<4000 suppressed) Size class (4000-8000)	-17.199	2.789	-6.17	0.000
Size class (8000+)	-16.47	6.041	-2.73	0.006
Constant	888.896	8.165	108.87	0.000
R-square= 0.646	F(5, 95584)=34862.32; Prob>F=0.0000			