

Derivation of Per Capita Income Variable

The ITC survey collects data on household income categories reported by household head and assigned to the individual respondents within the household. Reported income is an ordinal variable where each category represents a range of income that is continuous. In Bangladesh, the household income variable is coded in all four waves as:

1. 0-5,000 BDT
2. 5,001-10,000 BDT
3. 10,001-15,000 BDT
4. 15,001-20,000 BDT
5. 20,001+ BDT

One limitation of the ITC data is that there is no information on household composition. Hence, per capita income cannot be obtained directly. However, it is possible to use a proxy variable for per capita income from a national level household survey. The first step is to identify the ranking of households in the household survey by household income that can be matched with the income range in the ITC data. In the second step, per capita household income is obtained by dividing the average household income by the average household size corresponding to a particular household income group from the national level household survey. In the third step, per capita household income from the national level household survey is linked to the ITC data using the income range, and along with the price measures is used to create the affordability index for each individual.

The data on per capita income are obtained from the 2010 Bangladesh Household Income and Expenditure Survey stratified by urban and rural area of households as shown in Table 1. The income groups in Table 1 that correspond to the income groups in ITC Bangladesh data have been separated by lines. For each income group, the average number of members per household is estimated. Then the average per capita monthly income is calculated by dividing average monthly income per household by the average number of members per household.

In Table 2, the data from Table 1 are consolidated into the five income groups as in the ITC data by calculating the weighted average per capita monthly income of the sub groups weighted by the number of households in the Household Income and Expenditure Survey data. This weighted average per capita monthly income is assigned to each individual according to the respective income group and rural-urban strata. The per capita monthly income data is converted to annual income data by multiplying by 12. In calculating the average per capita income of the top income group (20,000+ BDT), we have excluded the sub-category with income 35,000+ BDT (approximately top 5% of the income distribution) to prevent extremely large income values from influencing the group average.

Since the Household Income and Expenditure Survey data is available only for 2010 and the ITC Bangladesh Survey was conducted in 2009, 2010, 2011-12, and 2014-15, we made adjustments for inflation and income growth to obtain per capita income for 2009, 2011-12 and 2014-15. The per capita income levels for 2009 are obtained by deflating the 2010 income levels by the per capita GDP growth rate and annual inflation rate in 2009. The per capita income levels for 2011-12 and 2014-15 are obtained by inflating the 2010 income levels by the corresponding per capita GDP growth rate and annual inflation rate compounded over the period in between, subject to the restriction that the implied monthly household income does not exceed three-quarters of the upper limit of each interval in 2011-12 and 95% of the upper limit of each interval in 2014-15. The calculated per capita monthly income levels by household income groups and residence (urban and rural) are reported in Table 3. These values have been imputed to the tobacco users in ITC surveys according to their reported monthly household income group and residence in each wave.

Table 1: Distribution of households, average number of members, average monthly income per household by monthly household income groups, 2010.

Monthly household income group (BDT)	No. of households	Total number of members	Average number of members per household	% of members	Cumulative % of members	Average monthly income per household (BDT)	Per capita monthly income (BDT)
National							
< 1500	899708	2085078	2.32	1.40%	1.40%	981.81	423.65
1500 - 1999	722085	2225429	3.08	1.50%	2.90%	1758.07	570.44
2000 - 2499	1001584	3599210	3.59	2.42%	5.33%	2252.71	626.88
2500 - 2999	1243259	4668858	3.76	3.14%	8.47%	2754.59	733.51
3000 - 3999	3058604	12054364	3.94	8.12%	16.59%	3490.23	885.59
4000 - 4999	3248717	13485979	4.15	9.08%	25.67%	4497.96	1083.54
5000 - 5999	2848093	12087953	4.24	8.14%	33.81%	5459.85	1286.42
6000 - 6999	2616635	11587112	4.43	7.80%	41.62%	6478.93	1463.09
7000 - 7999	2124357	9510419	4.48	6.40%	48.02%	7472.24	1669.09
8000 - 8999	1729835	8187025	4.73	5.51%	53.53%	8455.53	1786.57
9000 - 9999	1498640	7293140	4.87	4.91%	58.45%	9489.98	1950.06
10000 - 12499	3200563	15286174	4.78	10.29%	68.74%	11158.30	2336.28
12500 - 14999	2052878	10079446	4.91	6.79%	75.53%	13630.33	2776.09
15000 - 17499	1490295	7368396	4.94	4.96%	80.49%	16179.75	3272.44
17500 - 19999	1081676	5600565	5.18	3.77%	84.26%	18627.74	3597.70
20000 - 24999	1393177	7387448	5.30	4.98%	89.24%	22089.56	4165.80
25000 - 29999	776071	4320806	5.57	2.91%	92.15%	27275.93	4899.10
30000 - 34999	630548	3421991	5.43	2.30%	94.45%	32146.44	5923.42
35000 +	1411289	8239138	5.84	5.55%	100.00%	62799.55	10756.99
All groups	33028014	148488532	4.50	100.00%		11479.47	2553.36

Source: Bangladesh Household Income and Expenditure Survey 2010, Bangladesh Bureau of Statistics.

Monthly household income group (BDT)			No. of households	Total number of members	Average number of members per household	% of members	Cumulative % of members	Average monthly income per household (BDT)	Per capita monthly income (BDT)
Urban									
<	1500		115015	297519	2.59	0.76%	0.76%	1078.65	416.98
1500 -	1999		70656	200558	2.84	0.51%	1.28%	1704.04	600.33
2000 -	2499		93652	325949	3.48	0.84%	2.11%	2207.56	634.28
2500 -	2999		126083	424310	3.37	1.09%	3.20%	2747.40	816.39
3000 -	3999		447165	1692230	3.78	4.34%	7.53%	3476.33	918.61
4000 -	4999		508763	1943567	3.82	4.98%	12.51%	4513.44	1181.47
5000 -	5999		611053	2383985	3.90	6.11%	18.62%	5427.71	1391.21
6000 -	6999		595452	2411865	4.05	6.18%	24.80%	6432.77	1588.15
7000 -	7999		529232	2168873	4.10	5.56%	30.36%	7435.65	1814.39
8000 -	8999		486583	2074786	4.26	5.32%	35.67%	8429.74	1976.96
9000 -	9999		424911	1908366	4.49	4.89%	40.56%	9492.16	2113.50
10000 -	12499		1019803	4380723	4.30	11.22%	51.79%	11158.39	2597.60
12500 -	14999		731016	3253377	4.45	8.34%	60.12%	13581.59	3051.71
15000 -	17499		604300	2766807	4.58	7.09%	67.21%	16179.89	3533.86
17500 -	19999		410360	1988874	4.85	5.10%	72.31%	18690.41	3856.35
20000 -	24999		591088	2844288	4.81	7.29%	79.60%	21936.69	4558.79
25000 -	29999		347883	1822191	5.24	4.67%	84.27%	27497.13	5249.61
30000 -	34999		316866	1530105	4.83	3.92%	88.19%	32035.60	6634.18
35000 +			830265	4610879	5.55	11.81%	100.00%	61024.43	10988.46
All groups			8860147	39029250	4.41	100.00%		16474.94	3740.03

Source: Bangladesh Household Income and Expenditure Survey 2010, Bangladesh Bureau of Statistics.

Monthly household income group (BDT)		No. of households	Total number of members	Average number of members per household	% of members	Cumulative % of members	Average monthly income per household (BDT)	Per capita monthly income (BDT)
Rural								
<	1500	784693	1787559	2.28	1.63%	1.63%	967.62	424.76
1500 -	1999	651428	2024872	3.11	1.85%	3.48%	1763.93	567.48
2000 -	2499	907933	3273260	3.61	2.99%	6.47%	2257.37	626.15
2500 -	2999	1117175	4244548	3.80	3.88%	10.35%	2755.41	725.23
3000 -	3999	2611439	10362134	3.97	9.47%	19.82%	3492.61	880.20
4000 -	4999	2739954	11542412	4.21	10.54%	30.36%	4495.09	1067.05
5000 -	5999	2237040	9703968	4.34	8.87%	39.23%	5486.63	1264.82
6000 -	6999	2021182	9175247	4.54	8.38%	47.61%	6492.53	1430.22
7000 -	7999	1595125	7341546	4.60	6.71%	54.32%	7484.37	1626.16
8000 -	8999	1243252	6112239	4.92	5.58%	59.90%	8465.62	1721.94
9000 -	9999	1073729	5384774	5.02	4.92%	64.82%	9489.11	1892.14
10000 -	12499	2180760	10905451	5.00	9.96%	74.78%	11158.26	2231.31
12500 -	14999	1321862	6826069	5.16	6.24%	81.02%	13657.29	2644.72
15000 -	17499	885995	4601589	5.19	4.20%	85.22%	16179.66	3115.25
17500 -	19999	671316	3611691	5.38	3.30%	88.52%	18589.43	3455.27
20000 -	24999	802089	4543161	5.66	4.15%	92.67%	22202.22	3919.77
25000 -	29999	428188	2498615	5.84	2.28%	94.96%	27096.22	4643.48
30000 -	34999	313681	1891886	6.03	1.73%	96.69%	32258.40	5348.55
35000 +		581024	3628259	6.24	3.31%	100.00%	65336.14	10462.83
All groups		24167867	109459281	4.53	100.00%		9648.09	2130.23

Source: Bangladesh Household Income and Expenditure Survey 2010, Bangladesh Bureau of Statistics.

Table 2: Consolidated distribution of households, average number of members, average monthly income per household by monthly household income groups, 2010.

Monthly household income group (BDT)		No. of households	Total number of members	Average number of members per household	% of members	Cumulative % of members	Average monthly income per household (BDT)	Per capita monthly income (BDT), 2010
National								
<	4999	10173957	38118918	3.75	25.67%	25.67%	3255.53	868.90
5000 -	9999	10817560	48665649	4.50	32.77%	58.45%	7138.91	1586.86
10000 -	14999	5253441	25365620	4.83	17.08%	75.53%	12124.29	2511.05
15000 -	19999	2571971	12968961	5.04	8.73%	84.26%	17209.28	3412.90
20000 +		2799796	15130245	5.40	10.19%	94.45%	25792.09	4772.73
Urban								
<	4999	1361334	4884133	3.59	12.51%	12.51%	3414.57	951.73
5000 -	9999	2647231	10947875	4.14	28.05%	40.56%	7259.40	1755.35
10000 -	14999	1750819	7634100	4.36	19.56%	60.12%	12170.14	2791.12
15000 -	19999	1014660	4755681	4.69	12.18%	72.31%	17195.22	3668.73
20000 +		1255837	6196584	4.93	15.88%	88.19%	26025.11	5274.40
Rural								
<	4999	8812622	33234785	3.77	30.36%	30.36%	3230.96	856.73
5000 -	9999	8170328	37717774	4.62	34.46%	64.82%	7104.80	1539.02
10000 -	14999	3502622	17731520	5.06	16.20%	81.02%	12101.37	2390.46
15000 -	19999	1557311	8213280	5.27	7.50%	88.52%	17218.45	3264.77
20000 +		1543958	8933662	5.79	8.16%	96.69%	25602.56	4424.76

Table 3: Per capita household income (in current BDT), 2009, 2010, 2011-12, 2014-15.

				Per capita monthly income (BDT)			
Monthly household income group (BDT)				2009	2010	2011-12	2014-15
Urban							
	<	4999		873.21	951.73	1248.04	1576.89
5000	-	9999		1610.53	1755.35	2111.85	2668.31
10000	-	14999		2560.86	2791.12	2980.10	3765.34
15000	-	19999		3366.07	3668.73	3710.94	4688.75
20000	+			4839.28	5274.40	6086.52	7690.28
Rural							
	<	4999		786.05	856.73	1123.46	1419.49
5000	-	9999		1412.06	1539.02	1788.18	2259.35
10000	-	14999		2193.26	2390.46	2424.70	3063.59
15000	-	19999		2995.44	3264.77	3311.21	4183.70
20000	+			4059.73	4424.76	4892.34	6181.45