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Higher education in West Bengal: a comparative analysis of NSS Report 517 - Status of Education and Vocational Training in India, 2004-05

by

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Abstract

For a middle income state, WB's share of the population with 'at least higher secondary education' is very low. However its share of the population with 'a graduate degree or above' is relatively much higher. The difference in performance is due to the very high probability of opting for under-graduate education after finishing higher secondary. This high probability is underpinned by an exceedingly high preference, across both geography and gender, for under-graduate education vis-à-vis diploma programmes as a post-higher secondary choice. In terms of higher education attainments, WB is characterised by the sharpest rural-urban divide in our sample and rural WB with amongst the highest levels of gender discrimination. Urban WB is very different in terms of gender equity partly because the gender probability gap in opting for under-graduate education is in favour of females. Our analysis suggests that there is a strong correlation between the share of the population with 'at least higher secondary education' and per capita income levels. It also suggests that preference patterns within tertiary education maybe correlated with human development. A few policy recommendations are made keeping in the above.

(Keywords: West Bengal; education; higher education; likelihood; probability; preferences; rural; urban; gender; female; male; discrimination; higher secondary; diploma; under-graduate; graduate; HDI; per capita income)

Higher education in West Bengal: a comparative analysis of NSS Report 517 - Status of Education and Vocational Training in India, 2004-05

In terms of growth, the post-reform decade has been a good one for West Bengal. It has built on the impressive record of the 1980s and per capita SDP has grown by 5.6% p.a. between 1994/5-2003/4. Among the larger states, only Gujarat with per capita growth of 5.8% has a better record. As a result of this sustained growth, it is now a middle-income state though is still some distance away from high-income status – roughly about 50% below the clutch of top four states, outside of Delhi, in terms of per capita incomes – Punjab, Maharashtra, Haryana and Gujarat.

This background paper seeks use descriptive statistics to explore higher education in West Bengal (WB) in the context of this growth. The paper will largely be based upon data from the NSSO's 61st sample survey on education and employment. The paper also situates West Bengal's experience in higher education in the context of that of other middle and high income states. For some comparisons all states listed in Table 1 below

will be used. For others, we have chosen a set of comparators (the basis for which is explained below) against which to assess WB's performance.

The paper is divided into seven sections: Section I is a methodological note. Section II, III and IV situate the comparative context – Section II deals with the choice of comparators for WB; Section III looks at rural and urban household occupational categories for WB and its comparators; Section IV at the age-wise population distribution in WB and its comparators. Section V which essentially is the main body of the paper is in turn divided into three sub-sections: Va looks at attainment of at least a higher secondary education in the 15+ population; Vb at higher education broadly defined; and Vc at under-graduate education. Section VI conducts a few statistical exercises to explore the relationship between educational attainments on the one hand and per capita incomes and human development on the other. Section VII brings together the analysis of the preceding sections and in that light makes a few policy recommendations.

Table 1	Per capita incomes and average rates of growth of middle and high income states	
	Average PCY (2001/2-3/4) at constant 1993/4 prices	Average ROG of PCY(1994/5-2003/4)
Rajasthan	8788	5.0
West Bengal	**10981**	**5.6**
Andhra Pradesh	11080	4.8
Kerala	11565	4.5
Himachal Pradesh	11970	5.0
Karnataka	12563	5.4
Tamil Nadu	12719	3.8
Gujarat	14850	5.8
Haryana	14897	3.6
Maharashtra	15567	3.2
Punjab	15611	2.4
Delhi	47842	11.1
Note: On the basis of data from RBI's Handbook of Statistics on Indian Economy		

I: A brief note on method

This paper has defined higher education somewhat broadly and essentially in terms of choices made after finishing higher secondary education. It therefore uses two definitions of higher education: First, is **higher education broadly defined** and includes within its ambit diploma and technical certificate programmes as well under-graduate and post-graduate education. Second, is the more **traditional definition of higher education** as under-graduate and post-graduate education.

The rationale for doing so is to explore whether there are any patterns to post-higher secondary choices among middle and high income states and if there are, then whether they are related in some (any) way to income growth or human development or both.

Keeping the above in mind, we have used data collected by the NSSO's 61st sample survey on education and employment (NSS Report No. 517) to define 3 aggregates. First is the share of the15+ population with **at least higher secondary education**. To compute this aggregate we club together the following three categories from NSS Report No. 517: share of the 15+ population with higher secondary education; with diplomas; and with graduate degrees or above[1]. Second, is the **share of higher education broadly defined** in the 15+ population. To compute this aggregate we add the following two categories: share of the 15+ population with diplomas; and with graduate degrees or above[2]. Finally, is the **share of the 15+ population with graduate degrees or above**[3]. These three aggregates we have called **outcomes** in education.

We then compute probabilities of opting for various levels of education. The **probability of opting for higher education broadly defined** is the share of higher education broadly defined in the 15+ population as a proportion of the share of the15+ population with at least higher secondary education. Similarly the **probability of opting for under-graduate education** is the share of the15+ population with graduate degrees or above as a proportion of the share of the15+ population with at least higher secondary education.

It will be kept in mind that these are **conditional probabilities**, conditional upon the completion of higher secondary education. Both outcomes and probabilities are analysed across geographies, rural and urban, as well as by gender, female and male, for each geography.

Before proceeding two caveats need to be entered. First, the data in statement 3.8.1 deals with completed phases in education and does not include drop-outs. Therefore, for example, it tells us the share of diploma holders in a given 15+ population but does not tell us the share of the population that joined the programme but failed to make the final grade. Therefore strictly speaking we should call it the probability of opting for and completing a programme, but given that it is too cumbersome, probability of opting is used as shorthand.

Second, the word opting creates an illusion of choice. Particularly in India where the opportunity cost of education is very high, there are those who might decide to drop-out not because they do not want to continue but because they cannot afford to. We have tried to keep this fact upfront in the text as we have discussed the results.

Finally, given that diploma programmes are available at various levels of education (both pre- as well as post- under-graduate education), the NSSO's definition of diploma holders ensures that there is no intersection between diploma holders and graduates. It might be worthwhile quoting the relevant part of the definition to clarify matters:

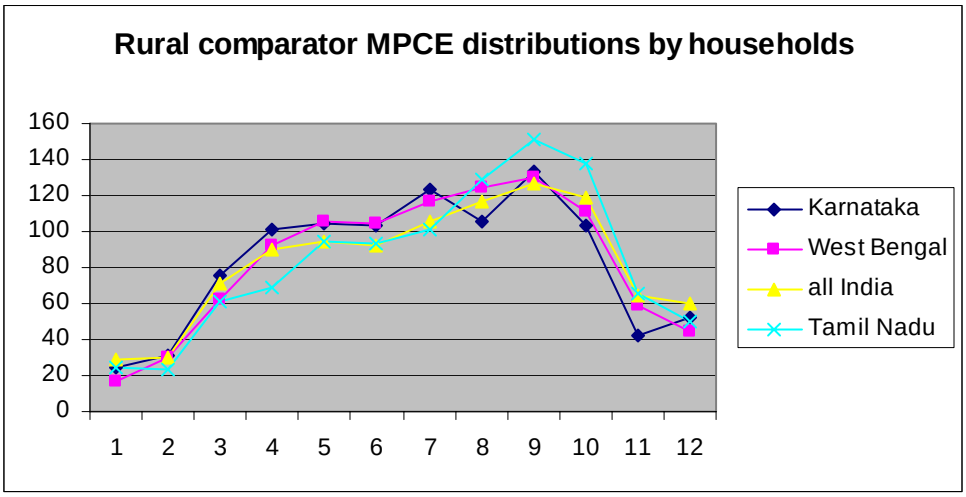
[1] Essentially we add together columns 6, 7 and 8 from statement 3.8.1 in **NSS Report No. 517: Status of Education and Vocational Training in India, 2004-05.**
[2] We add together columns 7 and 8 from statement 3.8.1 in **NSS Report No. 517.**
[3] Column 8 from statement 3.8.1 in **NSS Report No. 517.**

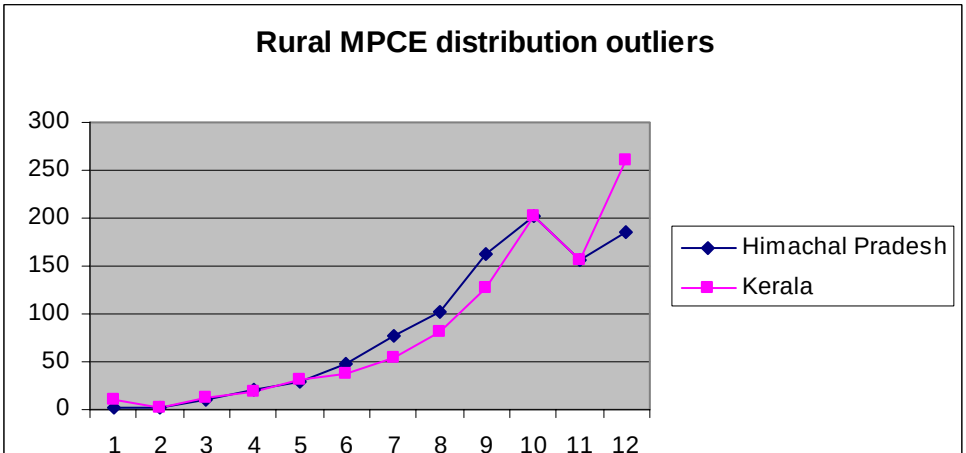
"The category 'diploma or certificate course' meant diploma or certificate courses in general education, technical education or vocational education, which is below graduation level. Diploma or certificate courses in general education, technical education or vocational education, which was equivalent to graduation level, was considered under the category 'graduate'. Similarly, diploma or certificate courses in general education, technical education or vocational education, which was equivalent to post-graduation level and above were considered under the category 'post-graduate and above'." [p.7, NSS Report 517]

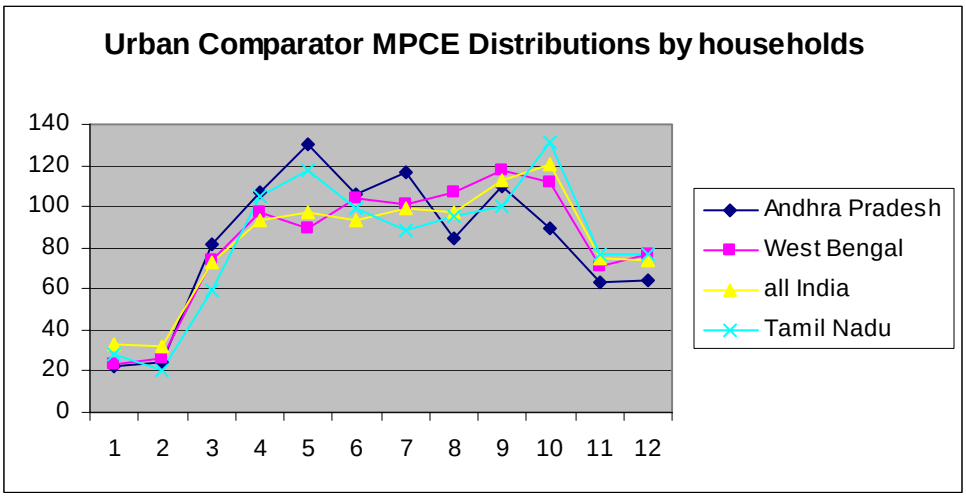
II: Rural and urban household income distributions

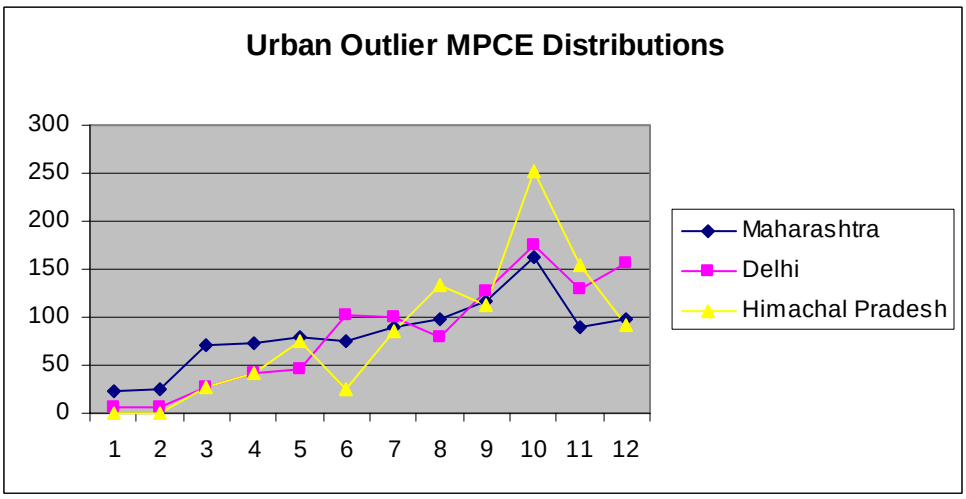
For choosing our comparators we have used income distribution as the criterion. Why income distribution? Primarily because higher education is increasingly being treated as an asset by economists and as many have argued, ownership of this particular asset in today's knowledge economy might have an important bearing of inequality. Inequality of course impacts both human development and growth.

Given that rural and urban economies tend to very different in terms of their assets profiles and opportunities, particularly where education is concerned, we therefore chose to check whether the data threw up different comparators at least at the level of household income. Why households rather than personal income distributions? Because in India, given the paucity of free and compulsory education (as well as the poor quality of what little there is available) household rather than personal incomes have a more important bearing on educational choices that are made (or not made).









And as expected the data does throw up different comparators for urban and rural geographies. Income distribution in rural West Bengal (WB) is similar to that in rural **Karnataka** and **Tamil Nadu**, with latter state having somewhat fewer households in the lower echelons of income distribution and somewhat greater in the upper ranges. It is interesting to note that rural Bengal's distribution is very similar to that of rural India.

We also note that among middle and high-income states, rural **Kerala** and **Himachal Pradesh** (HP) do not have inverted-U distributions, skewed or otherwise, and have the

bulk of the households located in the upper ranges of the income distribution. We have therefore labelled them 'outliers'.

The household income distribution for urban WB similar to that of urban **Andhra Pradesh** and **Tamil Nadu**, even though the distribution for the former is decidedly worse with a positive skew and for the latter somewhat ambiguous with twin peaks.

Urban **Maharashtra**, **Delhi** and **HP** have a decided negative skews, with a significant proportion of the households located in the upper ranges of the distribution and these three are our urban outliers.

III: Rural and Urban households by occupational categories

In terms of distribution of rural households by occupational categories, in rural WB, the modal household is engaged in agricultural labour (ALH), followed by self-employment in agriculture. In this it is similar to its comparators Tamil Nadu and Karnataka. But very dissimilar from the outliers, Himachal Pradesh and Kerala. In Himachal Pradesh, self-employment in agriculture is the modal household occupation, whereas in rural Kerala it is 'other labour' households. It is also worth noting that both outlier states, significant proportions of rural households are neither self-employed nor labouring households.

Table 2a: Per 1000 distribution of households by household type (statement 3.4.1/515)

Rural						
	SE in Agri	SE in non-agri	ALH	OLH	O	
Himachal Pradesh	428	142	17	193	221	1000
Kerala	207	185	161	273	174	1000
all-India	359	158	258	109	116	1000
West Bengal	269	215	326	89	101	1000
Tamil Nadu	205	135	355	166	138	1000
Karnataka	313	97	425	81	84	1000

Whereas there is some similarity between rural WB and its comparator states, there are differences as well. First, the share of ALH for both comparators is higher than for rural WB. The share of households engaged in non-agricultural self-employment however is much higher for rural WB.

Finally, it is worth noting that rural WB's occupational distribution is different from the all-India average. Self-employment in agriculture is the modal household occupational category at the all-India level, as opposed to the agricultural labour household in WB.

Table 2b: Per 1000 distribution of households by household type (statement 3.4.1/515)

Urban					
	SE	RE	Casual	O	
Delhi	324	589	39	48	1000
all-India	375	413	118	94	1000
Maharashtra	322	482	121	74	1000

West Bengal	373	403	131	92	1000
Tamil Nadu	328	434	133	105	1000
Andhra Pradesh	377	350	149	124	1000
Himachal Pradesh	251	398	236	115	1000

In urban WB, the modal household occupational category is 'regular employment'. In this it is similar with both its comparators as well as outliers, except Andhra Pradesh where the modal occupational category is 'self-employment'. The next occupational category in terms of importance is 'self-employment' for all states under discussion, except Andhra Pradesh where it is 'regular employment'.

For the outliers Maharashtra and Delhi have a significantly larger proportion of their households engaged in regular employment than others in this sample. Himachal Pradesh seems to have a occupational distribution that is quite unique among relatively high income states – it has a significant proportion of its urban households engaged in casual labour.

Finally, unlike in the rural instance, urban WB's household occupational distribution is very similar to the all-India average.

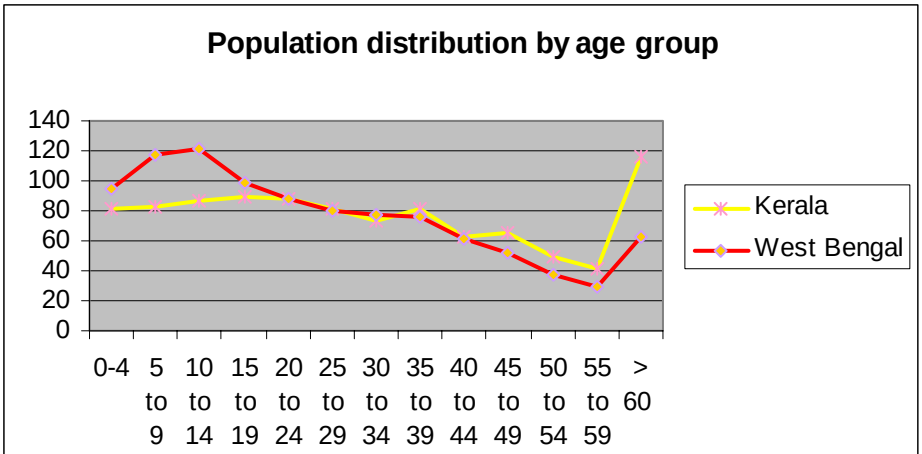
IV: Age-wise population distribution

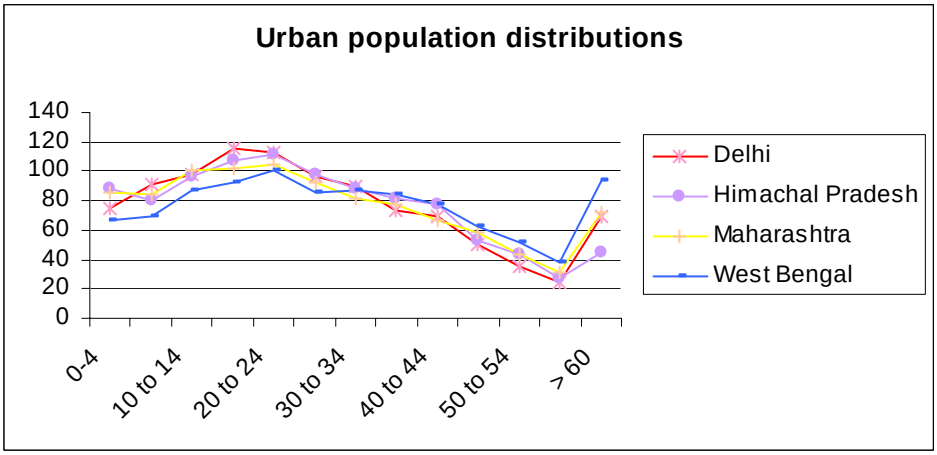
Rural: Accounting for 12.2% of the total population, 10-14 years is the modal age group for the rural WB population. The preceding age group 5-9 has the next largest share of the population with 11.8%. Therefore, potential entrants into high school and thereafter into higher education, be it a diploma or a college degree, has not yet peaked in rural WB.

The shares of the rural population in terms gender are not very different from each other in both these age groups. This is different from the all-India averages for these age groups where the share of girls in the 10-14 age group is more than 10% lower than that of boys.

All three states, rural Tamil Nadu, HP and Karnataka have the 5-9 and 10-14 age group accounting for a lower percentage of the population, even though 10-14 is the modal population age group in all of them.

As one would expect of a state with much lower population rates of growth, in rural Kerala the population distribution is much flatter in with shares significantly lower in the younger age groups.





Urban: As the graph above suggests in the 0-24 segment of the population, urban WB has a much flatter population distribution than urban Delhi, Maharashtra or Himachal Pradesh. And equally importantly, lies below all three states. Therefore, this segment of the population accounts for a smaller share than in the other three states. The modal population is in the age group 20-24. Therefore the number of potential entrants into higher education in urban WB has probably peaked.

V: Education characteristics of the 15+ population and patterns of outcomes

According to the NSSO's 61st sample survey on education, in WB, 33% of the 15+ population is not literate and another 32% has education only up to primary school level. 16% has not gone beyond middle school and 8% have finished only their secondary education. 5% of this population stopped after completing higher secondary education, 0.3% are diploma holders and nearly 6% are at least graduates.

At 38%, India as a whole has a much larger share of the 15+ population that is illiterate and at 23%, much smaller that has completed only primary school education. Diploma holders constitute more than 1% of the population. For the other categories, averages are almost the same as that of WB.

Among our sample, Andhra Pradesh and Karnataka have a higher share than WB of the 15+ population that is illiterate. All other comparators have lower shares, with Delhi and Kerala lowest shares at14.6 and 9.4% respectively.

Va: Attainment of at least a higher secondary education in the 15+ population

Given that to able to pursue higher education broadly defined, one at least has to have completed a higher secondary education, it would be useful to look at this aggregate in a comparative context. In West Bengal, 11% of the 15+ population has completed at least higher secondary education (column 'A' in Table 3a). The all-India average for this aggregate is 12.7%.

Table 3a: Outcomes and probabilities for persons of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
Rural+Urban Person	A	B	C	D	E
Andhra Pradesh	106	61	48	0.58	0.45
West Bengal	**110**	**61**	**58**	**0.55**	**0.53**
Karnataka	124	66	55	0.53	0.44
all- India	**127**	**69**	**57**	**0.54**	**0.45**
Tamil Nadu	152	84	66	0.55	0.43
Himachal Pradesh	159	77	54	0.48	0.34
Maharashtra	171	102	73	0.60	0.43
Kerala	179	116	58	0.65	0.32
Delhi	353	225	208	0.64	0.59

Source: Computations on the basis of data from Statement 3.8.1 in NSSO Report 517. Note: 1 = Higher Secondary; 2 = Diploma; 3 = Graduate and Above. Numbers in columns A and B refer to per 1000 distribution and numbers in columns C and D are percentages (%).

As Table 4 makes clear, only Rajasthan and Andhra Pradesh have a lower aggregate than WB. The highest is Delhi's aggregate at 35.3%. Leaving side Delhi, for other high income (such as Maharashtra) or high HDI (such as Kerala) states this aggregate is significantly higher than WB's, with the former at around 17% and the latter at around 18%[4].

It would be useful to get a sense of how this compares internationally with countries at different levels of income. Among OECD countries the aggregate 'at least higher secondary' ranges from 21, 23 and 26% for Mexico, Portugal and Turkey to 83, 84, 87 and 88% for Germany, Japan, Norway and the USA. Among non-OECD countries it ranges from 21, 24 and 30% for Thailand, Indonesia and Brazil to 42, 49 and 88% for Malaysia, Chile and Russia[5].

To put this in the context of comparative per capita incomes, in 2006, India's PPP per capita income was $3800. Indonesia was at $3950, Thailand at $9140, Malaysia at $11, 300 and Mexico at 11, 410. Whichever way we look at it, India's aggregate of 13% for 'at least higher secondary' is very low. Excepting Delhi, India's high income states too performing poorly in terms of this aggregate. At 11%, WB has aggregate that is even lower than the all-India average.

[4] At 11%, WB is almost 30% below the 12-state sample median of 15.6%.

[5] Source: **Table A1.2a** (Percentage of Population that has attained at least upper secondary education (2003)) in **OECD Education at a Glance 2006**. Our 'at least higher secondary' is equivalent to their 'at least upper secondary'.

Conclusion 1: At 12.7%, the proportion of the 15+ population with at least higher secondary education in India is significantly lower than countries at comparable levels of development. At 11%, WB's aggregate is lower than the all-India average. Equally importantly, it is also lower than most of its comparators among middle and high income states.

Rural-urban: The aggregate of 11% for WB hides substantial variation across both space and gender. In rural WB, the proportion of the 15+ population with at least higher secondary education is 5.4% (column A in Table 3b) whereas in urban WB it is significantly higher at 25.3% (column A in Table 3c). That is to say an urban person from WB is almost 5 times as likely as a rural person to have at least completed a higher secondary education. The all-India rural and urban average is 7.3% and 27% respectively, implying that an urban Indian is almost 4 times as likely as a rural Indian to have attained at least a higher secondary education.

It is equally noteworthy that of the 12 states in our sample of middle and high income states, the rural-urban divide in higher secondary education is sharpest in WB. Outside of WB, there are 3 other states where the rural-urban divide is sharper than the all-India average – Andhra Pradesh, Karnataka and Rajasthan. In the 8 other states in the sample, the rural-urban divide is narrower than the all-India average. It is narrowest for Kerala where an urban person is 80% more likely than a rural person to have attained at least higher secondary education. Kerala is followed by Himachal Pradesh where an urban person is twice as likely as a rural person to have attained the same educational status.

Not only is it the case that the aggregates for both rural and urban WB are below the all-India average, but the distance of rural WB from the all-India average (it is almost 30% lower) is much greater than that of urban WB from the relevant all-India average (it is little more than 6% lower). That is to say that not only does rural WB fare significantly worse than urban WB, but its position relative to the all-India average is significantly worse than the position of urban WB in relation to the all-India urban average.

Table 3b: Outcomes and probabilities for **rural** persons of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	E
West Bengal	**54**	**24**	**23**	**0.44**	**0.43**
Karnataka	62	25	20	0.40	0.32
all-India	**73**	**32**	**25**	**0.44**	**0.34**
Tamil Nadu	79	37	26	0.47	0.33
Himachal Pradesh	141	65	45	0.46	0.32
Kerala	154	94	41	0.61	0.26

Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies

In comparison with other middle income states which have a similar rural household income distribution, WB is not dissimilar from Karnataka, with both lying below the all-India average and not too far from each other. Tamil Nadu is however markedly different from WB – at 7.9% it almost 50% higher than WB's 5.4% and is also higher than the all-

India average. As compared with Himachal Pradesh and Kerala, rural outliers in terms of income distribution, WB is way behind – e.g., the proportion of the 15+ population with at least higher secondary education in Kerala is three times that of WB.

Table 3c: Outcomes and probabilities for **urban** persons of 15 years and above by general educational level					
	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	E
Andhra Pradesh	244	157	126	0.64	0.52
West Bengal	**253**	**158**	**150**	**0.62**	**0.59**
Tamil Nadu	263	155	126	0.59	0.48
all- India	**270**	**166**	**140**	**0.61**	**0.52**
Maharashtra	270	175	134	0.65	0.50
Himachal Pradesh	324	190	140	0.59	0.44
Delhi	364	234	217	0.64	0.60
Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies					

As Table 3c suggests, differences in urban areas are much less marked than in rural areas. Both Andhra Pradesh and Tamil Nadu, which have similar urban household income distributions as WB, have the 'at least higher secondary' proportion not too dissimilar from that for WB, with the former a little lower and the latter a little higher. All three are also below the all-India average of 27% for 15+ urban population with education levels of 'at least higher secondary'. All three states – Delhi, Himachal Pradesh and Maharashtra - with negatively skewed urban household income distribution have the 'at least higher secondary' proportion at least equal to the national average. For Maharashtra it is exactly the same as the national average, whereas Himachal Pradesh and Delhi are significantly higher. At 36.4%, Delhi's proportion is more than 40% higher than WB.

Conclusion 2: The proportion of the 15+ population with 'at least higher secondary education' is much lower in rural than urban WB, with the urban probability almost 5 times the rural probability. WB's rural-urban gap is greater than the all-India average where an urban Indian is almost 4 times as likely as a rural person to have at least completed higher secondary education. It is also higher than all other states in our sample.

Conclusion 3: Both rural and urban WB lag behind all-India averages as well their comparators.

Conclusion 4: In terms of share of the population with 'at least higher secondary education', rural WB compares poorly with rural Tamil Nadu, a state at a comparable level of income and a similar rural household income distribution.

Gender - rural:
There is a clear gender dimension to education attainment in WB in particular and, with a few notable exceptions, in India in general. In rural WB, in the 15+ population, a male is

3 times more likely than a female to have at least higher secondary education whereas a rural Indian male is a little more than twice as likely as a female to have attained the same level. In both rural Karnataka and Tamil Nadu the gap between the sexes is significantly lower than both WB and the all-India average. In Karnataka a rural male is almost twice as likely as a female to have completed higher secondary education. In Tamil Nadu a male is 60% more likely than a female. In Kerala moreover there is practically no gender bias in terms of educational attainment. Among middle and high income states, Rajasthan is worst off, with a male being 5 times as likely as a female to have at least finished higher secondary education.

Table 3d: Outcomes and probabilities for **rural males** of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	
West Bengal	**80**	**38**	**36**	**0.48**	**0.45**
Karnataka	81	35	28	0.43	0.35
Tamil Nadu	100	52	36	0.52	0.36
all-India	**103**	**48**	**38**	**0.47**	**0.37**
Kerala	158	100	42	0.63	0.27
Himachal Pradesh	167	85	57	0.51	0.34

Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies

Table 3e: Outcomes and probabilities for **rural females** of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	
West Bengal	**27**	**9**	**9**	**0.33**	**0.33**
Karnataka	43	15	12	0.35	0.28
all-India	**45**	**18**	**13**	**0.40**	**0.29**
Tamil Nadu	62	24	17	0.39	0.27
Himachal Pradesh	116	45	33	0.39	0.28
Kerala	152	90	41	0.59	0.27

Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies

Table 3f: Outcomes and probabilities for **urban males** of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	
West Bengal	**297**	**181**	**168**	**0.61**	**0.57**
Maharashtra	308	199	147	0.65	0.48
Tamil Nadu	311	200	155	0.64	0.50
all- India	**313**	**197**	**162**	**0.63**	**0.52**
Andhra Pradesh	314	212	164	0.68	0.52
Himachal Pradesh	314	190	135	0.61	0.43
Delhi	392	259	238	0.66	0.61

Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies

Table 3g: Outcomes and probabilities for **urban females** of 15 years and above by general educational level

	1+2+3	2+3	3	(2+3)/(1+2+3)	(3)/(1+2+3)
	A	B	C	D	
Andhra Pradesh	174	102	88	0.59	0.51
West Bengal	**204**	**132**	**129**	**0.65**	**0.63**

Tamil Nadu	217	112	98	0.52	0.45
all- India	**221**	**131**	**115**	**0.59**	**0.52**
Maharashtra	229	150	120	0.66	0.52
Delhi	328	202	190	0.62	0.58
Himachal Pradesh	337	191	147	0.57	0.44
Source: same as Table 3a. Note: the same explanatory note as in Table 3a applies					

Gender – urban:
Even though much less stark than in rural India, gender disparity is clearly visible in urban India as well. First, at an all-India level, an urban Indian male in the15+ population is 42% more likely than an urban Indian female to have at least a higher secondary education. Second, at 43 and 46% more likely respectively, both Tamil Nadu and WB have probabilities that are similar to the all-India average. In Andhra Pradesh, on the other hand, an urban male is almost twice as likely as an urban female to have at least a higher secondary education. It is worth recalling that Andhra Pradesh has a more positively skewed income distribution as compared with both Tamil Nadu and WB.

In all three urban outliers, states with negatively skewed income distributions, probabilities are less skewed against females than the national average. In Maharashtra and in Delhi males are 35 and 20% respectively more likely to have at least a higher secondary education. In Himachal Pradesh, there is no gender discrimination against females, who actually are 7% more likely than males to have at least a higher secondary education. Among middle and high income states, Himachal Pradesh is not alone – in Punjab as well females are 10% more likely than males to have at least a higher secondary education.

Conclusion 5: Again, and this time in terms of gender bias, rural WB (along with rural Rajasthan) is an outlier among middle and high income states. A rural WB male is 3 times more likely than a female to have completed at least higher secondary education. This likelihood is greater than the all-India average and as well as all of WB's rural comparators.

Conclusion 6: The gender bias reduces dramatically in urban geographies including WB which is much closer the urban Indian average. Even so, an urban WB male is 46% more likely to completed at least higher secondary education than a female. In this it is similar to some of its comparators but still some distance from states such as Himachal Pradesh where there is no gender bias against females in completing higher secondary education.

Conclusion 7: The rural-urban divide is significantly sharper than the female-male divide. This is true both for WB and India as whole, but the rural-urban divide in WB is significantly sharper as compared with the all-India level. The rural-urban divide in WB in terms of attainment of at least higher secondary education is also sharpest our sample.

Vb: Post higher secondary outcomes - higher education broadly defined:
6.1% of the 15+ population are either diploma holders or graduates and above (column B in Table 3a above). That is 6.1% of the population chose to and can afford to enter and complete a higher education programme. This compares with an all-India average of

6.9%. The distance from the all-India average is roughly the same as that for the aggregate 'at least higher secondary education'.

In terms of comparison with other middle and high income states, WB ranks no.3 from the bottom, with Rajasthan and Andhra Pradesh below it[6]. With 22.5% of the 15+ population either diploma holders or graduates and above, Delhi is the best educated state in the country, followed by Kerala at 11.6%. Even if we leave aside Delhi as being a special case, Kerala's higher education broadly defined proportion is almost twice that of WB. Therefore even though WB's distance from the all-India average for 'diploma holders or graduates' is about the same as that for 'at least higher secondary education', its distance from the best performers Delhi and Kerala actually increases[7].

Interestingly, however when we consider the probability of opting for higher education broadly defined (column D in Table 3a) in WB, it neither is low nor an outlier. At 0.55, not only is it marginally higher than the all-India average, but also 5th from the top among the 12 states in our sample. Though it is fair to mention that even though these probabilities range from 0.48 (Himachal Pradesh) to 0.65 (Delhi), a lot of them are clustered around 0.54-0.55 and statistically some of the differences are not very significant[8]. But what is worth noting is that WB is not very different from other middle and high income states in terms of opting for higher education broadly defined after completing higher secondary education.

All this to suggest that, if the proportion of the 15+ population who are 'diploma holders or graduates' is among the lowest among middle and high income states, then it is because the proportion of people who finish higher secondary education is among the lowest in our sample of middle and high income states. It has to be said however that the probability itself could and should increase, as the experience of Delhi and Kerala suggests.

Conclusion 8: The probability of opting for higher education broadly defined in WB is around the median value of distribution of probabilities in our 12-state sample. Therefore the relatively low proportion of people who complete a higher education programme reflects the low base on which this choice is exercised, i.e., the small proportion of the 15+ population that completes higher secondary education.

Rural-urban: The aggregate of 6.1% of the 15+ population who are either 'diploma holders or graduates and above' of course masks a significant rural-urban divide. The rural-urban dichotomy noted for the aggregate 'at least higher secondary education' gets repeated in the instance of higher education broadly defined as well, with the proviso that there is a widening of the gap between the two.

[6] At 6.1%, WB is 24% below the 12-state sample median of 8.05%.
[7] Kerala's share of the population with at least higher secondary education is about 60% higher than WB's whereas Delhi's is more than 3 times. In the instance of higher education broadly defined, Kerala's share is almost twice WB's and Delhi's is more than 3.5 times.
[8] The median value of the distribution of probabilities is 0.55, the same as WB's.

In rural WB, the proportion of the 15+ population who are either 'diploma holders or graduates' is 2.4% (Column B in Table 3b) whereas in urban WB it is significantly higher at 15.8% (Column B in Table 3c). That is to say that an urban person is more than 6 times as likely as a rural person to be either a diploma holder or a graduate. The all-India rural and urban shares are greater for both geographies at 3.2 and 16.6% respectively, implying that an urban Indian is more than 5 times as likely as a rural Indian to have attained at either a diploma or a graduate degree[9].

The difference between rural and urban is explained at least in part by the differing probabilities in the two geographies of opting to continue for higher education broadly defined. In rural WB this probability is 0.44 (column D in Table 3b) as against 0.62 for urban WB (column D in Table 3c). The probability for rural India is 0.44 whereas that for urban India is 0.61. Even though WB's probabilities are not very dissimilar from the all-India average, there are important differences between rural and urban WB. The probability for rural WB is clustered around the lower end of the distribution of probabilities in our 12-state sample of middle and high income states (4th from the bottom). Urban WB on the other hand not only has a probability marginally greater than the all-India average, but clustered around the higher end of the distribution (5th from the top). This has to be assessed in context with the fact that the distribution of probabilities in rural WB has a variance and SD that is significantly greater than that for urban WB[10]. All this to say that rural WB has a probability of continuing in higher education broadly defined that is low, relative to others in the sample. It is also worth noting that the lower variance for urban geographies vis-à-vis rural, suggests a greater 'preference' for higher education in the former – though one cannot say whether that reflects choice, affordability or availability or some combination.

The increase in the gap between rural and urban geographies at these two levels of education – 'at least higher secondary' and 'higher education broadly defined' – is true across all middle and high income states in our sample. The increase is least in states where the difference in probabilities is the narrowest – Kerala, Haryana and Delhi - all of whom have a difference of 0.11 between urban and rural geographies. At the other end there is Karnataka and Punjab where the difference between urban and rural is 0.2 and 0.22 respectively and the increase in the gap has been significantly greater. WB is just behind with a gap of 0.18.

Both Karnataka (2.5%) and Tamil Nadu (3.7%), states with rural household income distributions similar to WB's, have a higher proportion of the 15+ population that is either a diploma holder or a graduate. The reason however in each instance is different. In Karnataka the share of the population completing at least higher secondary is greater than

[9] An urban person in WB is almost 5 times as likely as a rural person to have completed at least higher secondary education, whereas an urban Indian is almost 4 times as likely as a rural person.

[10] Rural probabilities range from 0.36-0.61 with a variance and SD (not including all-India value) of 0.0039 and 0.062 respectively. The urban distribution of probabilities ranges from 0.58 to 0.71with a variance and SD of 0.0016 and 0.04 respectively, i.e., the rural variance is more than 2.4 times the urban variance and a SD that is more than 50% higher. If we leave Kerala, which has the highest probabilities in both geographies (0.61for rural and 0.71 in urban), out, the rural ranges from 0.36-0.53 and the urban from 0.58-0.65 and the difference in variance increases to 2.8 times and in SD to almost 70%.

that in WB, therefore even though the probability of opting for higher education is lower (0.40), the share of population who are diploma holders or graduates is slightly higher. In Tamil Nadu both the share of the population completing at least higher secondary education and the probability of opting for higher education are greater and therefore the share of population who are diploma holders or graduates is significantly greater. The same is true for Kerala where at 9.4% the proportion of diploma holders and graduates is 3 times that of WB – it operates on a much higher base and significantly different probability (0.61).

When we look at WB's urban comparators, Andhra Pradesh and Tamil Nadu, states with a similar distribution of urban household income as WB, both have a proportion of the 15+ population that are either diploma holders or graduates that is very similar to that of WB (15.8%), 15.7% for the former and 15.5% for the latter. The proportion for all three however is also lower than the national average. Among the three, the probability of opting for higher education is also similar though with urban Andhra Pradesh ahead at 0.64 and followed by urban WB at 0.62 and urban Tamil Nadu at 0.59.

All three states with negatively skewed urban household income distribution, Maharashtra, Himachal Pradesh and Delhi, have the 'higher education broadly defined' proportion greater than the national average. Delhi at 23.4% also has the highest proportion of diploma holders or graduates amongst our middle and high income states. At 0.64 its probability of opting to stay in higher education is not very different from WB's. Delhi's large proportion clearly then reflects the much larger proportion of the 15+ population who finish higher secondary – the base effect. The highest probability of continuing after higher secondary education is that for Kerala – 0.71.

As we have seen, taking all 12 middle and high income states in our sample, the distribution of probabilities ranges from 0.58 to 0.71[11] and has a much lower variance, reflecting higher 'preference' either due greater value attached to higher education in urban geographies or greater financial ability to afford continuing or availability or a mix of all these. The closeness of WB's probabilities with urban frontrunners means that its gap from states with negatively skewed income distributions such as Himachal Pradesh and Delhi is much smaller than the equivalent rural gap.

Conclusion 9: The gap between rural and urban WB in higher education broadly defined is greater than that for the aggregate 'least finished higher secondary'. This however is true across our sample of middle and high income states, as well as characterising the all-India average.

Conclusion 10: Rural WB suffers not only from a low base, i.e., a very small proportion of the 15+ population complete higher secondary, but also from the fact that the probability of opting to continue in higher education broadly defined is low. On both these metrics, base and probability, rural WB lags significantly behind its comparators

[11] As we know, it is even narrower if we leave Kerala out. Then it ranges between 0.58-0.65. The comparable rural probabilities range from 0.36-0.61. If we leave Kerala (0.61) out, it still ranges from 0.36-0.53.

and best performers. This clearly qualifies the conclusion no.8 that the aggregate probability of opting for higher education broadly defined in WB was the same as the median value for all 12 states taken together.

Conclusion 11: In urban WB the probability of continuing in higher education broadly defined is much less of a problem and compares favourably with best performers. However the proportion of the 15+ population who are diploma holders or graduates in urban WB is lower than the all-India average, largely due to the fact that its base in terms of those finishing higher secondary is very low. This is a characteristic that it shares with other states with similar urban household income distributions, Andhra Pradesh and Tamil Nadu

Gender - rural:
WB's rural average of 2.4% of the 15+ population who are diploma holders or graduates disaggregates to 0.9% for females and 3.8% for males. Both of these are lower than the all-India average for rural females and males which is1.8 and 4.8% respectively (column B in Tables 3d and 3e). That is to say, a male in rural WB is more than 4 times as likely as a female to be either a diploma holder or graduate as compared with a rural Indian male who is almost 3 times as likely as rural Indian female to have acquired that educational status.

It is worth noting that, as compared with the position of rural females in finishing higher secondary education[12], gender discrimination in acquiring diplomas or under-graduate degrees is worse, both in WB and at the all-India level. It worsens for 9 out of the 12 states in our sample, with Delhi showing a significant improvement and the change in Kerala and Haryana being insignificant[13]. In this overall trend of worsening access for females, rural WB fares very badly relative to other middle and high income states in our sample – 8 have the gender discrimination likelihood lower than all-India average of almost 3 times. Only in rural Rajasthan is the gender discrimination in higher education worse than in rural WB – a male is almost 8 times as likely as a female to be either a diploma holder or a graduate.

Both rural WB's comparators, Karnataka and Tamil Nadu, have lower levels of gender discrimination. In rural Karnataka, 1.5% of females and 3.5% of males had acquired either diplomas or are graduates. In rural Tamil Nadu, it is 2.4 and 5.2% for females and males respectively. Karnataka like WB was lower than the national average on both counts whereas Tamil Nadu is higher on both. Even though in terms of educational outcomes rural WB and Karnataka are similar on so many counts, in terms of gender discrimination the two are very different and the latter is a lot more like rural Tamil Nadu.

[12] In rural WB, a male is 3 times more likely than a female to have completed higher secondary education whereas a rural Indian male is more than twice as likely as a female to have reached the same level.
[13] In rural Delhi it reduced from males being more than 2 times as likely females in competing higher secondary to being them 1.3 times as likely females in acquiring being either diploma holders or graduates. In rural Kerala it rose from 1.04 to 1.11 and in Haryana from 1.76 to 1.84.

In rural Karnataka and Tamil Nadu males are 2.33 and 2.17 times respectively as likely as females to be diploma holders or graduates. This though marked, is lower than the all-India gender gap and of course a great distance from that in rural WB. With rural male merely 10% more likely than a female, gender outcomes are far more equitably distributed in Kerala. Himachal Pradesh goes from being an outlier in gender discrimination in finishing higher secondary education to close to the national norm when it comes to diplomas holders or graduates, with discrimination probabilities worsening from 1.4 to 1.9 respectively. In terms of access to higher education broadly defined, in WB, rural females, as compared with males, are worse off than all other states in our sample excepting Andhra Pradesh and Rajasthan.

Again differing probabilities between females and males in opting for or being able to continue in higher education broadly defined have some role to play in these outcomes. The probability that a rural WB male will opt, after completing higher secondary education, to continue and obtain either a diploma or an undergraduate degree, is 0.48. The same probability for rural females is 0.33. The all-India probabilities for rural males and females are 0.47 and 0.4 respectively. In rural Tamil Nadu they are 0.52 and 0.39 respectively for males and females. In rural Kerala, it is 0.63 and 0.59 respectively for males and females. In one of the few exceptions among rural geographies, in rural Delhi female probability is higher than male, at 0.72 and 0.47 respectively[14].

Conclusion 12: In rural WB, gender discrimination is much worse in access to higher education broadly defined than in access to higher secondary education. Both of rural WB's comparators, rural Karnataka and rural Tamil Nadu, perform significantly better in this regard.

Conclusion 13: We had noted earlier (conclusion 10) that in rural WB the probability of opting to continue and obtain either a diploma or an undergraduate degree is very low. One reason for this is gender discrimination, with the probability that a rural female will opt for either a diploma programme or an under-graduate degree is both very low and significantly lower than that for males. Therefore not only are there fewer females (than males) who qualify to enter higher education broadly defined, but even among those who do, even fewer (than males) decide to opt for and complete a higher education programme.

Gender - urban:
WB's urban average of 15.8% of the 15+ population who are diploma holders or graduates disaggregates to13.2% for females and 18.1% for males. National urban averages are 13.1 and 19.7% for females males and respectively. Therefore unlike rural WB where aggregates for both males and females were below the national average, in urban WB, the aggregate for females is slightly higher than the national average.

[14] It will be recalled that rural Delhi was the only state which recorded a significant improvement in gender access between the two levels of education – completing higher secondary and continuing to become diploma holders or graduates.

As in the case of higher secondary education, so too in higher education broadly defined, gender discrimination is much less stark in urban India with an urban Indian male 50% more likely than an urban Indian female to have a completed either a diploma or an under-graduate degree[15], which is marginally higher than the 42% more likelihood that urban males have of completing higher secondary education. In comparison, in urban WB, males are 37% more likely than females to have acquired the former level of education, which is marginally lower than the 46% more likelihood that urban WB males have of completing higher secondary education. Urban WB then bucks the national trend and gender discrimination in access to higher education broadly defined is somewhat lower as compared with access to higher secondary education.

To put this mild improvement in context, it should be noted however that in our 12-state sample, there are 8 where this index of gender discrimination is lower than the all-India average and there are 6 where it is better than urban WB. Indeed there are two states, Punjab and Himachal Pradesh, where there is no gender discrimination in terms of access to higher education. In urban Punjab females are 10% more likely than males to be either diploma holders or graduates[16]!

Urban WB performs much better in terms of gender equity as compared with urban Andhra Pradesh and urban Tamil Nadu, comparators with similar urban household income distributions. In the former, males are twice as likely as women to be either diploma holders or graduates whereas in the latter males are 80% as likely, as against 37% more likely in the instance of urban WB. Therefore even though both Andhra Pradesh and Tamil Nadu, at 19.9 and 20% respectively, have a larger proportion of males who are either diploma holders or graduates as compared with WB (18.1%), both, at 10.2 and 11.2% respectively, have a lower proportion of females with the same educational status, as compared with WB at 13.2% (see Tables 3f and g). It is interesting to note the reversal - rural Tamil Nadu performs much better than rural WB in terms of gender equity.

However all three states with negatively skewed urban household income distribution - Maharashtra, Himachal Pradesh and Delhi – have male and female shares for higher education broadly defined greater than that of urban WB. For urban females the shares are 15, 19.1 and 20.2% respectively as against 13.2 for WB. For urban males the shares are 19.9, 19 and 25.9% respectively as against 18.1 for WB. And as we have already noted, WB's urban male share is below the all-India average and female share almost identical to the all-India average. In other words, the relative performance of urban WB females in higher education broadly defined is much better than that of urban WB males.

One of the reasons for the relatively better performance of urban females is their higher probability of opting for and completing a higher education broadly defined programme, either degree or diploma. The probability that an urban WB female will opt, after completing higher secondary education, to continue and obtain either a diploma or an

[15] In rural India this probability is slightly less than 3.

[16] It will be recalled that in urban Punjab, in terms of gender equity a similar result obtained for access to higher secondary education.

undergraduate degree, is 0.65. The all-India probability for urban females is 0.59. The probability for urban WB females is no.3 from the top and very close to the no.1 Kerala with 0.67. Tamil Nadu has the lowest probability at 0.52, not too different from the next in line, Rajasthan at 0.54. The importance of the higher probability of opting for higher education is clearly brought out by the Tamil Nadu example. At 21.7%, Tamil Nadu has a higher share than WB (20.3%) of the urban female population with at least a higher secondary education. However, given that Tamil Nadu has a lower probability than WB of urban females choosing to continue, at 11.2% it has a lower share of the urban female population (as opposed to WB's 13.2) that has either a diploma or a graduate degree.

The same probability for urban WB males is 0.61 whereas the all-India probability is 0.63. WB's probability is no.4 from the bottom, with Himachal Pradesh, Gujarat and Punjab below it. It is some distance from Kerala which has the highest probability for urban males at 0.71, followed by Andhra Pradesh at 0.68. Therefore even though with nearly 30% of the urban male population with at least a higher secondary education, WB is not far off the median value[17], it loses out relative to other middle and high income states, because it has a lower probability of an urban male opting for higher education broadly defined. Kerala's example brings this dynamic out very well. At 27%, Kerala has a lower share than WB[18] of the urban male population with at least a higher secondary education. However, given that, at 0.71, Kerala has a higher probability than WB of urban males choosing to continue, at 20.6% it has a higher share of the urban male population (as opposed to WB's 18.1) that has either a diploma or a graduate degree.

This differential performance in terms of probabilities and the fact that the urban female probability of opting for higher education broadly defined in WB (0.65) is greater than the urban male probability (0.61), explains why WB's performance in terms of gender equity is so much better than that of its comparators. In other words, the gender probability gap in opting for higher education broadly defined (0.04) is in favour of females, and works towards lowering discrimination against them.

To take the Tamil Nadu experience as another example, the urban female and male probabilities in opting higher education broadly defined are 0.52 and 0.64 respectively. The gender probability gap of 0.12 is in favour of males and works towards worsening the discrimination against females. And as we have already noted, an urban male in Tamil Nadu is 80% more likely than an urban female to be a diploma holder or graduate as opposed to 37% more likely in WB[19]. Or Himachal Pradesh, where the female and male probabilities are 0.57 and 0.61 respectively and the gender probability gap of 0.04 is in favour of males. But because females are 7% more likely than males to have completed at least higher secondary education, gender parity is maintained in access to

[17] The median value for urban males with at least higher secondary education in our sample is 30.25%, as opposed to 29.7 for WB.
[18] Indeed it has the lowest share among all the 12 states in our sample.
[19] It is worth recalling that urban Tamil Nadu and WB are very similar in terms of gender discrimination in higher secondary education. An urban male is 43 and 46% respectively more likely than a female to have at least completed higher secondary education (see p.12 above).

higher education broadly defined, despite the gender probability gap in opting for higher education broadly defined being slightly in favour of males.

Conclusion 14: In the instance of higher education broadly defined, the relative performance of urban females in WB is better than that of urban males.

Conclusion 15: The probability of urban females opting for higher education broadly defined is amongst the highest in our sample of middle and high income states. This helps mitigate the fact that WB has a relatively low share of urban females who have at least a higher secondary education and pulls up the share of urban females who are either diploma holders or graduates to marginally higher than the national average.

Conclusion 16: The probability of urban males opting for higher education broadly defined is amongst the lowest in our sample. This reinforces the fact of WB has a relatively low share of urban males who have at least a higher secondary education and pulls down the share of urban males who are either diploma holders or graduates to being significantly lower than the national average.

Conclusion 17: However, given the fact that the gender probability gap in opting for higher education broadly defined works in favour of females, WB's performance in terms of gender equity is not only better than at the all-India level, but significantly better than some of its urban comparators such as Tamil Nadu, where it works against them. There is, however, still some distance to be travelled in achieving equality among the sexes in outcomes in higher education broadly defined, as is the case in Punjab and Himachal Pradesh, which build on gender equity in higher secondary education as well.

Vc: Post higher secondary outcomes – graduates and above:
5.8% of WB's 15+ population are holders of a graduate or a higher degree. That is to say, after finishing higher secondary education, 5.8% of the 15+ population chose and completed an under-graduate college education rather than a professional or technical education. This is slightly higher than the national average for this level of education which stood at 5.7% (column C in Table 3a). It is worth recalling that at 6.1% of the 15+ population that are either diploma holders or graduates, the share was below the national average of 6.9%[20].

Not only is WB's performance in terms of the share of the graduate population marginally better than the all-India average, its performance, vis-à-vis other middle and high income states in our sample, improves as well. It has the same proportion as Kerala and is marginally higher than both Karnataka and Himachal Pradesh (5.5 and 5.4% respectively)[21] and significantly higher than Andhra Pradesh (4.4%). Tamil Nadu at 6.6%

[20] It should also be recalled that at 11% of the 15+ population with at least higher secondary education, WB's share is lower than the national average of 12.7% (see p8, section Va above).
[21] It is worth reminding ourselves that both Kerala and Himachal Pradesh have higher shares than WB in both aggregates – 'at least higher secondary education' and 'higher education broadly defined' (see Table 3a on p8 and discussions in sections Va and Vb respectively).

however has a higher share WB's. Delhi at 20.8% has the highest share followed by Maharashtra at 7.3%[22] (see Table 3a above).

To situate this in the international context, among OECD countries, the aggregate 'graduates and above' ranges on the one hand from 8 and 10% for Portugal and Turkey respectively and 14% for both Mexico and Germany, to 21% for Japan, and 29% for both Norway and USA on the other. Among non-OECD countries it ranges from 2% for Indonesia and 8% for both Thailand and Brazil to 11, 12 and 21% for Malaysia, Chile and Russia. India's aggregate of 5.7% (or WB's 5.8%) compares poorly as does that of most other middle and high income states, except Delhi. At nearly 21%, Delhi compares very favourably with best performers among both OECD and non-OECD countries[23].

To return to WB, the reason for improvement in its performance in under-graduate education despite doing poorly, both in an absolute and a relative sense, in higher secondary education, lies in the high probability of persons from WB, after completing higher secondary, opting for and completing an under-graduate college education rather than a professional or technical education. This is not only significantly higher than the national average but is amongst the highest in our sample of middle and high income states.

In WB the probability of opting for an undergraduate college education after finishing higher secondary is 0.53 whereas the national average is 0.45 (see column E in Table 3a). WB's probability is the second highest in our 12-state sample, being topped only by Delhi at 0.59. It is higher than Andhra Pradesh, Karnataka and Tamil Nadu all of which hover around the national average with probabilities of 0.45, 0.44 and 0.43 respectively[24]. Interestingly, Kerala and Himachal Pradesh have the lowest probabilities at 0.32[25] and 0.34 respectively.

This difference in probability explains why Kerala and WB's shares of graduates in the 15+ population are identical despite the fact that the former's share of persons who have completed at least higher secondary education is more than 50% higher than that of the latter. It also explains why Himachal Pradesh has a lower share of graduates than WB despite a significantly higher share than the latter in the aggregate 'at least higher secondary education'. The difference in probabilities however was not sufficient to overhaul the advantage that Tamil Nadu and Maharashtra have over WB with their much

[22] At 5.8%, WB is 2.5% below the sample median of 6%. This compares with being 30 and 24% below respectively of the 12-state sample medians of 'at least higher secondary education' and 'higher education broadly defined' (see fns. 4 and 6).

[23] It will be recalled that, in terms of the share of the population with 'at least higher secondary education', Delhi is also the only middle and high income state to compare favourably with countries at similar levels of development (see p9 above). In the case of graduate education, it has gone one better, and compares very favourably with best performing developed countries.

[24] It will be recalled that in WB the probability of opting for higher education broadly defined, after finishing higher secondary, is 0.55, which is almost identical to the national average of 0.54. Also the probabilities of Andhra Pradesh, Karnataka and Tamil Nadu are not very dissimilar to that that of WB's. Indeed among these 4 states, Andhra Pradesh has a slightly higher probability at 0.58.

[25] At 0.65, Kerala has the highest probability in our 12-state sample of opting for, after finishing higher secondary, higher education broadly defined..

larger share of the population that finishes higher secondary education. Delhi of course is in a different class altogether – it has the highest share of the 15+ population that has at least completed higher secondary education[26] and the highest probability of continuing for an undergraduate education – resulting in a share of graduates that is almost 3 times that of the second place holder in our sample, Maharashtra.

Therefore even though Delhi and WB are very different in terms of income[27], they are rather similar in terms of the probability of choosing, after completing higher secondary, an undergraduate education as opposed to a diploma programme. And in this respect, both are very different from the other states in our sample. After finishing higher secondary education, 95%[28] of those who continued and completed in WB, chose under-graduate education and only 5% a diploma programme. In Delhi the preference for a graduate degree is slightly lower at 92%. At the all-India level, a little more than 80% chose undergraduate education and a little less than 20% chose diploma programmes. Tamil Nadu, Andhra Pradesh and Karnataka hovered around the national average with a little more than 20% choosing diplomas. In Maharashtra and Himachal Pradesh almost 30% chose diploma programmes. Kerala had the highest preference with 50% choosing diploma programmes[29].

Conclusion 18: In terms of graduate education India and most middle and high income states compare poorly with countries at comparable levels of development, let alone developed OECD economies.

Conclusion 19: The only exception is Delhi which compares very favourably with best performing OECD and non-OECD countries.

Conclusion 20: WB's relative performance in graduate education is significantly better than in higher secondary or higher education broadly defined.

Conclusion 21: This is because it has, along with Delhi, amongst the highest probabilities of opting for under-graduate college education after finishing higher secondary. In this both are significantly different from most of other states in the sample.

Conclusion 22: Delhi and WB have a very high preference for under-graduate education as opposed to diploma programmes. This is not only higher than the national average but significantly different from other states in our sample.

Rural-Urban: As at other levels of education, the aggregate of 5.8% of WB's 15+ population who are at least graduates masks a wide disparity between rural and urban areas. In rural WB, the proportion of the 15+ population who are at least graduates is

[26] At 35.3% it is more than 3 times that of WB's 11%. Kerala's share is 17.9%.
[27] Delhi's per capita income is almost 5 times that of WB's (see Table 1 above).
[28] This probability is arrived at by expressing the share of graduates as a proportion of the share of higher education broadly defined in the 15+ population.
[29] The four states that follow Delhi in per capita income rankings are Punjab, Maharashtra, Haryana and Gujarat (see Table 1 above). In these four states, after finishing higher secondary education, 23, 28, 17 and 21% respectively, of those who continued and completed chose a diploma programme

2.3% whereas in urban WB it is significantly higher at 15%. That is to say that an urban person is more than 6.5 times as likely as a rural person to be a graduate. The all-India rural and urban average is 2.5 and 14% respectively, implying that an urban Indian is 5.5 times as likely as a rural Indian to have attained a graduate degree[30].

It is worth underlining that urban WB's share of graduates in the 15+ population is greater than that of urban India's whereas in rural geographies both have similar shares. This is in contrast with higher education broadly defined, where as we have already noted, (see rural-urban discussion in section Vb, p.14 above), WB's shares, both rural and urban are lower than that of rural and urban India's respectively.

As in the case of higher education broadly defined, so too with under-graduate education, the difference between rural and urban is explained at least in part by the differing probabilities in the two geographies of opting for under-graduate education after finishing higher secondary. At 0.43 (column E in Table 3b), the rural WB probability of opting for under-graduate education is clearly lower than the 0.59 for urban WB (column E in Table 3c). The probability for rural India is 0.34 whereas that for urban India is 0.52.

WB's probabilities, both rural and urban but particularly the former, of opting for graduate education are clearly dissimilar from all-India probabilities. This again contrasts with higher education broadly defined, where WB and all-India probabilities of opting to continue are very similar in both geographies respectively. Second, in terms of probabilities of opting, both rural and urban WB perform very well vis-à-vis other states in our sample. WB's probabilities for under-graduate education, both rural and urban, are amongst the highest in our sample of 12 middle and high income states. In both instances, rural and urban, Delhi is the only other state with higher probabilities.

Again, this contrasts with the pattern that emerges when we look at WB's probabilities, both rural and urban, of opting for higher education broadly defined. As we have noted earlier, rural WB's probability of opting for higher education broadly defined after completing higher secondary is at the lower end of our sample, whereas the urban probability, even though it is in the top half, is clearly nowhere near the top. All this to say, both in an absolute and relative sense, WB's probabilities, both rural and urban, of opting for graduate education after finishing higher secondary are different, both quantitatively and qualitatively, from those of higher education broadly defined, and reflect faithfully the pattern at the state-wide level.

Relatively high probabilities of opting for graduate education of course only take one thus far. An equal if not greater influence on the share of graduates in the 15+ population is exercised by the share of the population that has at least finished higher secondary education. Therefore, on the one hand, rural WB's share (2.3%) of graduates in the 15+

[30] The distance between rural and urban WB, when higher education broadly defined and graduates is compared, stays roughly the same. On the other hand, at the all-India level the rural-urban distance for graduates is somewhat greater than that for higher education broadly defined. Even though there is some convergence in these likelihoods, it needs to be emphasized however that the rural-urban difference in WB for both higher education broadly defined and graduates is greater than that at the all-India level.

population is greater than rural Karnataka's (2%), even though Karnataka has a higher share of the population which has at least finished higher secondary education. This is because rural WB's probability (0.43) of opting for graduate education is higher than Karnataka's (0.32). However, on the other hand, despite the fact that Tamil Nadu's probability (0.33) is lower than WB's, its share of graduates is higher (2.6%) because its share of the population with at least higher secondary education is significantly greater[31].

For similar reasons rural geographies of both Himachal Pradesh and Kerala have significantly higher shares of graduates in their 15+ population, 4.5 and 4.1% respectively, even though both have significantly lower probabilities (0.32 and 0.27 respectively) of opting for under-graduate education than WB. Rural Delhi, which has the highest share of 15+ population with 'at least higher secondary education' as well as the highest probability of opting for under-graduate education, not unsurprisingly, at 8.6%, has the highest share of graduates in the 15+ population.

In urban WB however the story is somewhat different and demonstrates how, in the urban context, the probability of opting makes a difference. At 15%, not only, as we have already noted, is urban WB share of graduates in the 15+ population higher than the all-India average, but it also is the 2nd highest in our sample of 11 middle and high income states. It is topped by Delhi at 21.7%. Outside of Delhi therefore WB's share is higher than all its urban comparators. This, despite the fact that, at 25.3%, urban WB's share of the 15+ population with at least higher secondary education is not only lower than the national average, but is the 3rd lowest in our sample. Except Andhra Pradesh, all the other urban comparators – Tamil Nadu, Maharashtra, Himachal Pradesh and Delhi – have higher shares with at least higher secondary education.

The explanation for the improvement in urban WB's relative performance in terms of the graduate education lies in differences in the probability of opting. Perhaps the best example of this is the comparison between urban Himachal Pradesh and West Bengal. The former's share with at least higher secondary education is significantly greater than the latter's – 32.4% as against 25.3%. However given that the probability of opting for under-graduate education after completing higher secondary is significantly lower in urban Himachal Pradesh – 0.43 as opposed to 0.59 – its share of graduates in the 15+ population is lower than urban WB's – 14 as against 15%. For similar reasons, urban WB has a higher share of graduates than urban Tamil Nadu, Maharashtra and Kerala as well. In the instance of Andhra Pradesh of course WB started out with a higher share of the urban population with 'at least higher secondary education' and this effect is reinforced by a higher urban probability of opting for under-graduate education after completing higher secondary.

Why does the probability of opting not seem to matter as much in rural contexts as in urban? At least part of the answer has to do with the much greater variance in rural shares in our 12-state sample as opposed to urban ones. For example, at 5.4%, rural Rajasthan and rural WB have the lowest shares in our sample, of the 15+ population with at least

[31] Rural WB's share of the 15+ with at least higher secondary education is 5.4%, Karnataka's is 6.2 and Tamil Nadu's is 7.9%.

higher secondary education. The highest is Delhi with 19.7%. That is, Delhi's share is almost 4 times that of Rajasthan and WB. On the other hand, among urban geographies, Rajasthan and Andhra Pradesh, at 22.6 and 24.4% respectively, have the lowest shares of the population with at least higher secondary education. Delhi again has the highest share at 36.4%. Delhi's share is approximately 60 and 50% respectively higher than Rajasthan and Andhra Pradesh, but clearly the urban gap between the highest and lowest is much narrower than the equivalent rural gap. As we had noted earlier, urban geographies seem to have a higher 'preference' for education, as compared with rural.

To put it differently, the coefficient of variation (CV) of the share of the population with at least higher secondary education in urban geographies in our sample (0.14) is significantly lower than that for rural (0.46). Therefore even though rural probabilities of opting for under-graduate education tend to have a much greater variance than urban ones, but given that rural gaps in higher secondary education are much greater, when states are located at the bottom of the distribution, as rural WB is[32], a high probability of opting is unable to close the gap and make a difference to relative positions. On the other hand, given that inter-state urban gaps in higher secondary education are narrower and urban WB is situated in the middle of the distribution[33], high probabilities of opting are able to close the gap and make an important difference to both absolute and relative positions. Clearly initial conditions have a determinative weight in outcomes.

We had noted earlier (conclusion 18) that in terms of the share of the graduates in the population neither India nor most middle and high income states compares very well with other countries at comparable levels of development, let alone developed OECD countries. The only exception to this being Delhi. It is worth pointing out that at 14%, the share of graduates in the urban Indian 15+ population compares well with OECD averages. The median value for the graduate share of the population in high-income OECD countries is 18% and for the entire OECD club taken together is 16%[34]. Urban geographies in many of the middle and high income states including WB, Punjab, Himachal Pradesh, Haryana and Maharashtra with graduate shares at 15, 14.7, 14, 13.8 and 13.4% respectively compare very well too. Of course, at nearly 22%, urban Delhi would compare with OECD best performers.

Finally, the preference for under-graduate education over diploma programmes noted above for WB in general (conclusion 22), repeats itself in both rural and urban geographies. In rural WB, 96% of those who continue after higher secondary choose under-graduate college education as opposed to diploma programmes. The rural all-India average is significantly lower at a little less than 80%. Interestingly, rural WB has a somewhat higher preference for under-graduate education than rural Delhi, where a little more than 80% opt for under-graduate education. Amongst WB's rural comparators, in Karnataka a little more than 85% opt for under-graduate education whereas in both

[32] The median value of the distribution of shares in our sample of the rural population with 'at least higher secondary education' is 9% as opposed to WB's share of 5.4.
[33] The median value of the distribution is 26.1%. Urban WB is just a shade below that at 25.3%.
[34] It should be mentioned however that OECD averages include both rural and urban geographies. Luxembourg has been left out of both calculations.

Himachal Pradesh and Tamil Nadu, around 70% opt for under-graduate education. In Kerala a little less than 45% opt for under-graduate college education as opposed to diploma programmes. Indeed, WB has the highest preference rate in our 12-state sample, followed by Rajasthan at a little more than 85%. Rural WB is clearly an outlier in this regard.

Urban WB too has a high preference for under-graduate education, with 95% of those who continue after higher secondary choosing under-graduate college education as opposed to diploma programmes. In this respect it is very similar to urban Delhi where 93% chose under-graduate college education over diploma programmes. The all-India urban average is around 85%. Therefore urban WB and urban Delhi are not that different from all-India pattern in this regard. Its comparators, Andhra Pradesh and Tamil Nadu are a shade lower than the all-India average, in the low 80s. A notch lower are Maharashtra and Himachal Pradesh at 77 and 74% respectively. In our 12-state sample, urban Kerala is clearly the outlier, with 60% of those who continue after higher secondary choosing under-graduate college education as opposed to diploma programmes.

Conclusion 23: In the case of graduate education as well WB is characterised by a very sharp rural-urban divide which is significantly worse than the all-India rural-urban divide. In WB an urban person is 6.5 times more likely than a rural person to be a graduate.

Conclusion 24: In both geographies, rural as well as urban, WB, along with Delhi, has amongst the highest probabilities of opting for under-graduate college education after finishing higher secondary. In this both are significantly different from most of the other states in the sample.

Conclusion 25: Despite the high probability of opting for under-graduate education in rural WB, given the very low share of the 15+ population with at least higher secondary education and its poor position in the distribution, rural WB's share of graduates remains low, both in an absolute and relative sense.

Conclusion 26: However in urban WB, given that both the absolute and relative position, in terms of the share of the 15+ population with at least higher secondary education, is much better, high probabilities of opting do make a difference and urban WB has the 2nd highest share of graduates, topped only by Delhi.

Conclusion 27: Probabilities of opting for under-graduate education matter much more in urban than in rural India because the spread across urban geographies in terms of the educational attributes is much narrower than in rural geographies, perhaps reflecting a much higher 'preference' for education.

Conclusion 28: The share of the graduate population in urban India and the urban geographies of some middle and high income states including WB are comparable to OECD levels. Urban Delhi compares with OECD best performers.

Conclusion 29: Both rural and urban WB have very similar and high preference for under-graduate college education as opposed diploma programmes. Both have the highest preference in their respective geographies amongst all states in our sample. In this regard rural WB is an outlier. Urban WB is not, reflecting a much higher urban preference for under-graduate college education.

Gender - rural:

Rural WB's average proportion of 2.3% of the 15+ population who are graduates disaggregates in gender terms into 0.9% for females and 3.6% for males. The gender disaggregation of the all-India rural average of 2.5% is 1.3 and 3.8% for females and males respectively. As in the case of both, the proportion of the population with at least higher secondary education and that which opted for higher education broadly defined, the shares of rural females and males who are graduates in WB too lags behind their counterparts in rural India. The gap however is a lot narrower in the instance of graduates[35].

A rural WB male is therefore 4 times as likely as a female to have completed under-graduate education as opposed to the rural Indian male who is 3 times as likely as a female to have achieved the same level of education. It is worth noting that even though at the all-India level gender discrimination against rural females in access to under-graduate education worsens slightly as compared with access to higher education broadly defined[36], most states in our sample buck that trend and it stays the same or declines somewhat in 9 of the 12, including WB where it declines marginally. The only state where there is a significant worsening is Rajasthan.

However it also needs to be stressed that as compared with access to higher secondary education, gender discrimination in access to under-graduate education is distinctly worse not only at the all-India level but in 9 out of 12 states in our sample, including WB. It is different only in three states – Delhi, Haryana and Kerala. In Delhi there is a significant improvement, moving from a situation where a rural male in Delhi is twice as likely as a rural female to complete higher secondary education to one of gender equality in under-graduate education[37]. In Haryana it declines somewhat and in Kerala there is no gender discrimination at either level of education[38].

[35] For example, the share of rural females in WB with at least higher secondary education was 40% below the all-India average whereas the share of rural females with an under-graduate degree is 30% below. The narrowing in the case of males is even more significant with respective gaps reducing from around 20 to around 5%.

[36] The likelihood of a rural male success, as compared with that of a female, rising slightly from 2.67 in the case higher education broadly defined to 2.92 in the case of under-graduate education.

[37] Actually in rural Delhi a female is 5% more likely than a male to be a graduate!

[38] In Haryana it declines from males being 80% more likely than females to have completed higher secondary education to 60% more likely in the case of under-graduate education. Interestingly in the case of Kerala, in the instance of higher education broadly defined, a rural male is 20% more likely than a rural female to have completed a programme. Clearly males are more likely than females to opt for diploma programmes in rural Kerala.

In all of rural WB's comparators – Karnataka, Tamil Nadu, Himachal Pradesh and Kerala – gender discrimination in under-graduate education is not only lower than in rural WB but also the national average. In Karnataka and Tamil Nadu rural males are a little more than twice as likely as females to have completed under-graduate education. In Himachal Pradesh rural males are 70% more likely and, as we have already noted, in Kerala there is no gender discrimination. Indeed gender discrimination in rural WB is amongst the worst in our 12-state sample, topped only by Andhra Pradesh and Rajasthan. Equally important, gender discrimination in rural WB at all three levels of education – higher secondary, higher education broadly defined and under-graduate and graduate education – is amongst the worst in our 12-state sample and decidedly worse than the national average.

The reason gender discrimination in under-graduate education is so much worse in WB has to do not only with gender differences in the probability of opting to continue after finishing higher secondary education but also on the relative gap between the two probabilities (female and male). The probability that a rural WB male will, after finishing higher secondary education, opt to continue and complete an undergraduate education is 0.45. For a rural WB female this probability is 0.33. The same probability for a rural Indian male is 0.37 and for a rural Indian female 0.29. Therefore, in rural WB the gender probability gap is 0.12 in favour of males whereas the all-India rural gap is 0.08 in the same direction. This is why gender discrimination in graduate education in rural WB worsens so much more than rural India.

The greater the gender probability gap in the direction of males the more it amplifies differences inherited from unequal starting points for males and females in completion of higher secondary education. By the same token, the more unequal the starting point between males and females in higher secondary education, the greater the probability gap needs to be in the direction of females to compensate.

All of rural WB's comparators, across both genders, have lower probabilities of opting for and completing an under-graduate education. But the gender probability gap against females is lower as well[39]. In Karnataka it is 0.07, in Tamil Nadu it is 0.09, in Himachal Pradesh it is 0.06 and in Kerala it is 0 (i.e. the probabilities are equal). In Delhi, the one state in our sample which has seen significant decline in gender discrimination across two levels of education – higher secondary and under-graduate – the female probability of opting for under-graduate education after finishing higher secondary is significantly higher than that of males – 0.72 as compared with 0.34. That is to say the gender gap is 0.38 but to the advantage of females. And in Haryana, which also saw a mild decline in discrimination between the two levels, female probabilities are marginally higher with a gender gap in their favour of 0.04. All this to say that relatively, outside of Rajasthan, rural females in WB suffer the highest level of discrimination in our 12-state sample.

[39] In fact rural WB has the amongst the highest gender probability gap in our sample. Only rural Rajasthan at 0.13 has a higher gap.

Therefore it is the difference in the gender probability gaps in under-graduate education alongside the much higher[40] gender discrimination against females in rural WB in higher secondary education that explains why rural WB's comparators have performed so much better in terms of gender equity in under-graduate education.

Despite the relatively huge gender probability gap in rural WB, its female and male probabilities of opting for under-graduate education are not only higher than the all-India rural average, but also are amongst the highest in our 12-state sample. At 0.45 the rural WB male probability is the highest in our sample and at 0.33, the rural female probability is third from the top, behind Delhi at 0.72 and Haryana at 0.41. It will be recalled in this context that rural WB's probability of opting for higher education broadly defined is very low relative to other states (see p.12 above). This remains true even when we disaggregate the probability of opting for higher education broadly defined by gender (see p.15 above).

The fact of relatively high probabilities across gender of opting for under-graduate education reflects high preference across both females and males for under-graduate education as opposed to diploma programmes, faithfully reflecting the pattern for rural WB as a whole (see conclusion 22 and p.22-23 above). The probability of rural females opting for under-graduate education as opposed to a diploma programme after finishing higher secondary is almost 1 whereas for rural males it is 0.95. Again, for rural females it is similar to Delhi whereas for rural males in Delhi have a somewhat lower preference rate for under-graduate education of around 70%.

The relatively high probability (it is the highest in our sample) of opting for under-graduate education and the extremely high preference vis-à-vis diploma programmes, does help improve the relative position of the rural WB male in under-graduate education. It will be recalled in rural WB that the share of the male 15+ population with at least higher secondary education as well as the share that has obtained either a diploma or a graduate degree is the lowest in the 12-state sample. But the high probability of rural males of opting for under-graduate education ensures that it becomes middle ranking in terms of its share of graduates. It has a higher share than Karnataka and the same as that of Tamil Nadu. Himachal Pradesh and Kerala however continue to have higher shares as a result of the base effect. For rural females relatively higher probability is unable to outweigh the disadvantage of a low base and they continue to languish at the bottom of the league table.

Conclusion 30: In rural WB, discrimination against females is marginally lower in under-graduate education as compared with higher education broadly defined.

Conclusion 31: In all of rural WB's comparators gender discrimination in attainment of graduate education is significantly lower.

[40] See conclusion 5 in section Va and discussion in p12. Rural WB males are 3 times more likely than females to complete at least higher secondary education whereas the all-India average is 2 times more likely. All of rural WB's comparators have discrimination metrics much better than the all-India average.

Conclusion 32: Gender discrimination in rural WB across all three levels of education – at least higher secondary, higher education broadly defined and graduates – is not only worse than the national average but amongst the highest in our 12-state sample. Only rural Rajasthan has a worse record than rural WB in discrimination against females at all three levels.

Conclusion 33: In rural WB discrimination against females is much worse in higher education, broadly or narrowly (under-graduate) defined, as compared with attainment of higher secondary education. This however is true both nationally as well as for most states in our sample, excepting Delhi and Kerala.

Conclusion 34: Both rural females and males in WB have a relatively high probability of opting for undergraduate education after finishing higher secondary.

Conclusion 35: Even though rural WB's comparators have lower probabilities, across both genders, of opting for under-graduate education, their gender probability gap against females is also much lower as compared with WB. This alongside better initial conditions explains their superior performance in terms of gender equity.

Conclusion 36: Rural WB's high probability of opting for under-graduate education reflects the high preference, across gender, for under-graduate education as opposed to diploma programmes, faithfully reflecting the pattern for WB as a whole.

Conclusion 37: The high (relative) rural male probability of opting for under-graduate education helps improve the WB rural male's relative position in under-graduate education. Female probability of opting for under-graduate education however is unable to have the same impact on the relative position of rural women.

Gender - urban:

The gender disaggregation of urban WB's share of graduates (15%) in the 15+ population is 12.9 and 16.8% for females and males respectively. The national urban average of 14% disaggregates to 11.5 and 16.2% for females and males respectively. That is to say both female and male shares in urban WB are higher than their respective national averages. It is worth pointing out the contrast with higher education broadly defined (either graduates or diploma holders) where even though the share of urban WB females is higher than the national average, the male share is actually lower.

Again, as in earlier instances, urban discrimination against females is much less pronounced than rural. An urban WB male is 30% more likely than an urban female to be a graduate and this level of discrimination is somewhat lower than the national average of 41%. It is also marginally lower than the same discrimination metric for higher education broadly defined, where an urban WB male is 37% more likely than a female to be either a diploma holder or a graduate. Indeed, unlike the rural instance, in urban WB, gender equity improves, even if marginally, across all three levels of education – discrimination falls from an urban male being 46% more likely than a female to complete higher secondary to 30% in the instance of graduates.

In our 12-state sample there are 9, including urban WB, where gender equity in under-graduate education is better than the national average, 6 of which have a better record than urban WB's. Of these 6, in three – Punjab, Himachal Pradesh and Kerala – there is no gender discrimination against females in terms of attainment of a graduate degree. Indeed in Punjab, an urban female is 17% more likely than a male to be a graduate[41]!

In both Tamil Nadu and Andhra Pradesh, WB's urban comparators with similar household income distributions, gender discrimination in under-graduate education is significantly worse than in urban WB – an urban male in Tamil Nadu being almost 60% more likely than a female to be a graduate and an urban Andhra Pradesh male nearly twice as likely as a female. The gender disaggregation of graduates in urban Tamil Nadu is 9.8 and 15.5% for females and males respectively. In Andhra Pradesh, it is 8.8 and 16.4% respectively for females and males. Therefore shares of both female (12.9%) and male (16.8%) graduates in the 15+ population of urban WB are greater[42] than both Tamil Nadu's and Andhra Pradesh's (see Tables 3f and g). Notice however that male shares of the three states are much closer to each other whereas WB's female share is significantly higher than other two. It is the significantly higher female share that results in urban WB's performance in terms of gender equity in graduate education being better than both its comparators.

The performance of urban WB's comparators with negatively skewed income distributions in terms of gender equity in graduate education is more varied. In Maharashtra and Delhi gender discrimination is marginally lower than in urban WB[43] and as we have already noted, there is no gender discrimination in Himachal Pradesh in terms of access to graduate education[44]. Urban Maharashtra's gender break up of the 15+ population that are graduates is 12 and 14.7% respectively for females and males. For Himachal Pradesh these shares are 14.7 and 13.5% for urban females and males respectively. Finally in urban Delhi, 19% of females and 23.8% of males are graduates (see Tables 3f and g). Urban WB then has a higher share of female graduates than Maharashtra but a lower share than Himachal Pradesh and Delhi[45]. On the other hand it has a higher share of male graduates than both Maharashtra and Himachal Pradesh but a lower share than Delhi[46]. And as we have already noted, urban WB's female and male graduate shares are higher than the national average.

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[41] It is worth noting in parenthesis that in terms of gender equity urban Punjab has the best record at all three levels of education amongst urban geographies in our 12-state sample. An urban Punjab female is 10% more likely than a male to have completed higher secondary. She is also 10% more likely to have a higher education qualification (the holder of either a diploma or a graduate degree). And now an urban Punjab female is almost 20% more likely to be a graduate. Perhaps equally importantly, as Table 4 suggests, even in absolute terms it is amongst the best performers in our sample.

[42] It will be recalled that both Andhra Pradesh (19.9%) and Tamil Nadu (20%) have a larger proportion of urban males who are either diploma holders or graduates as compared with WB (18.1%). Urban WB's female shares for the same education level were greater than both.

[43] In Maharashtra an urban male is 23% and in Delhi 25% more likely than a female to be a graduate.

[44] Indeed, a female is almost 10% more likely than a male to be a graduate in urban Himachal Pradesh.

[45] Urban WB has the fourth highest share of female graduates in our 12-state sample, behind Delhi, Punjab and Himachal Pradesh.

[46] Indeed, urban WB has the second highest share of male graduates in our 12-state sample, behind Delhi.

Clearly females and males in urban WB perform much better in terms of under-graduate education, both in absolute and relative terms, as compared with other levels, with the relative improvement of females being higher than that of males. It will be recalled that, besides being below the national average, urban WB females have the 3rd lowest share[47] in our 12-state of the 15+ population with at least higher secondary education. WB's urban male share, on the other hand, even though it too is below the national average, is situated around the middle[48] of the distribution in our 12-state sample.

Urban WB's improved performance in graduate education across gender has much to do with its high probabilities of opting, of both females and males, for an under-graduate education after finishing higher secondary. For urban WB females the probability that they will opt for under-graduate education after finishing higher secondary is 0.63 (column E in table 3g) and the highest in our sample. It is followed by Delhi at 0.58. It is this very high probability of opting for under-graduate education that allows urban WB females to overcome the disadvantage of a low base in terms of the share of the 15+ population with at least higher secondary education. As a result they go from being the 3rd lowest in our 12-state sample in terms of the 15+ population with at least higher secondary education to having the 4th highest share of female graduates in our sample, behind Delhi, Punjab and Himachal Pradesh. But as the experience of the last three states suggests, beyond a point it is difficult to overcome the disadvantage of a low base.

For urban WB males the probability that they will opt for under-graduate education after finishing higher secondary is 0.57 (column E in Table 3f) and the second highest in our sample, after Delhi at 0.61. Despite the fact that urban WB males have slightly lower probability of opting for under-graduate education than urban WB females, they are less disadvantaged than their female counterparts in terms of the share of the 15+ population with at least higher secondary education. As a result they go from being in the bottom-half (see fn.40) of the distribution in our 12-state sample in terms of the 15+ population with at least higher secondary education to having the second highest share of male graduates in our sample, behind Delhi.

Why is it that in WB urban male probability of opting for under-graduate education, despite being slightly lower than the equivalent female probability, seems to have relatively more clout in affecting outcomes (relative positions in terms of shares of the gender-specific 15+ population with graduate degrees)? The reason has to do with a much lower variance of urban male shares, across states, of the 15+ population with at least higher secondary education as compared with equivalent female shares[49]. Given that our sample average for the urban male share of the 15+ population with at least higher secondary education is higher than the equivalent female average, the lower variance in male shares relative to female shares can be taken as another measure of gender inequality.

[47] The median value of the distribution is 22.3% as opposed to 20.4% for urban WB females.
[48] The median value of the distribution is 30.3% as opposed to 29.7% for urban WB males.
[49] The standard deviation (SD) of male shares is 3.05 as opposed to 5.85 for female shares. The CVs are respectively 0.10 and 0.24.

Therefore prior gender inequity, favouring males across all states in our sample, in the gender distribution of higher secondary education compensates for the slightly lower urban WB male probability of opting for graduate education and gives it more clout in determining relative positions, because absolute shares in higher secondary education across states in our sample are so much closer together for males than for females. Or put differently, prior and greater discrimination against females across urban geographies in higher secondary education means that the female probability of opting for under-graduate education has relatively more compensating to do than the male equivalent, and despite being higher than the latter, is not high enough to make good all the prior discrimination.

Be that as it may, the high probability of opting for under-graduate education for both males and females has an important role to play in determining gender equity outcomes vis-à-vis urban WB's comparators both those with similar household income distributions as well as those with negatively skewed distributions.

To recall, urban WB's female and male probabilities of opting for under-graduate education are 0.63 and 0.57. The gender probability gap in urban WB therefore is 0.06 in favour of females[50]. For Andhra Pradesh, these are 0.51 and 0.52 for females and males respectively. In Andhra Pradesh, on the other hand, it is in the other direction, 0.01 in favour of males. Despite the fact that Andhra Pradesh has a slightly[51] higher share of urban males who have completed higher secondary education (31.4 as opposed to 29.7% for WB), the lower male probability of opting for under-graduate education, results in having an urban male graduate share very similar to that of WB (16.4 as opposed to 16.8 for the latter).

On the other hand, Andhra Pradesh's share of urban females with higher secondary education is already significantly lower than WB's (17.4 as opposed to 20.4) and the distance is amplified by latter's higher probability of opting for under-graduate education. As a result, Andhra Pradesh's share of female graduates, at 8.8%, is distinctly lower than WB's 12.9 and consequently the latter's distinctly superior gender equity performance. The fact that the gender probability gap is working in favour of females in WB and in Andhra Pradesh against them amplifies the existing difference between the two female shares in higher secondary education. In sum, WB's superior gender equity performance is a combination of its larger share of females who complete higher secondary education as well as gender probability gaps in undergraduate education working in favour of females in WB and against them in Andhra Pradesh.

[50] It is worthwhile recalling that in rural WB the gender probability gap in opting for under-graduate education is 0.12 against females.

[51] Given the low variance that we have discussed earlier, the small absolute difference has a very important impact on relative positions. Andhra Pradesh is higher than national average, and the shares (with Himachal Pradesh) the 2nd highest position in our sample behind Delhi. WB is below the national average and in the bottom half of the sample.

In Tamil Nadu on the other hand, higher shares for both females and males with at least higher secondary education, 21.7 and 31.1% respectively, get counteracted by lower probabilities, 0.42 and 0.50 for females and males respectively, of opting for under-graduate education and results in lower urban under-graduate shares for both females and males at 9.8 and 15.5% respectively. In addition, in Tamil Nadu discrimination against females worsens, because the gender probability gap 0.08 in undergraduate education is against women, whereas because the reverse is true in WB, the latter's gender equity vis-à-vis the former improves between the two levels.

Maharashtra is another example of starting out with higher shares for both females and males in higher secondary education (22.9 and 30.8 respectively) but lower probabilities of opting for under-graduate education (0.52 and 0.48 respectively for females and males) mean that its urban female and male graduate shares (12 and 14.7% respectively) are lower than WB's. Notice however that because its gender equity performance in higher secondary education is better than WB's and it has a gender probability gap in under-graduate education of 0.04 in favour of females, it continues to perform better than WB in terms of gender equity in under-graduate education as well. However, given that WB's gender probability gap (0.06) is greater than Maharashtra's, the gap between the two narrows[52].

Delhi is a relatively more straightforward case where significantly higher shares of female and male in higher secondary education in urban Delhi (32.8 and 39.2% respectively) and very high probabilities of opting for under-graduate education (0.58 and 0.61 respectively for females and males) translate into the highest female and male graduate shares (19 and 23.8% respectively) in our 12-state sample. Delhi is an overwhelming example of the fact that beyond a point, high probability cannot counteract a large base effect.

One point of interest however is that Delhi has a gender probability gap of 0.03 against females, therefore as one would expect, gender equity worsens marginally between the two levels – higher secondary and under-graduate[53]. However, given that its gender equity performance in higher secondary is better than WB's, it continues to be better in under-graduate education as well despite the marginal worsening and the gender probability gap in under-graduate education in favour of females in urban WB. Therefore an urban male is 20% more likely than an urban female in Delhi to have completed

[52] An urban male is 34% more likely than an urban female to have completed higher secondary education in Maharashtra, as opposed to 46% more likely in WB. The greater gender probability gap in favour of women in WB is not sufficient to close the inherited equity gap but helps narrow it. As a result, an urban male is Maharashtra is 23% more likely than a female to be a graduate as opposed to 30% in WB. Notice of course that in both states the gender gap has narrowed as between higher secondary and under-graduate education.

[53] It is worth recalling that Delhi has the highest probability (0.72) of rural females opting for under-graduate education after finishing higher secondary and the highest gender gap (0.38) in favour of females. The high probability combined with the high gap meant Delhi had the sharpest improvement in gender equity, in our sample, between higher secondary and under-graduate education (see p.24-5 above). Urban Delhi is quite the opposite in comparison, with a lower female probability opting for under-graduate education and a mild worsening in terms of gender equity, because of a gender probability gap in under-graduate education against females.

higher secondary education and 25% more likely to be a graduate, which is marginally lower than the 30% higher male likelihood in WB of being a graduate.

Himachal Pradesh is an interesting example combining significantly higher (than WB) female and male shares in higher secondary education in urban Himachal Pradesh (33.7 and 31.4% respectively) [54] and relatively low probabilities of opting for under-graduate education (0.44 and 0.43 respectively for females and males), translating into a relatively high female and but very low male graduate shares (14.7 and 13.5% respectively) in our 12-state sample[55]. It is worth keeping in mind that Himachal Pradesh (along with Punjab) has one of the best records amongst our sample in terms of gender equity in urban geographies. At both levels of education - higher secondary and under-graduate - an urban Himachal female is almost 10% more likely to complete than a male. And the equal gender probabilities of opting for under-graduate education are a reflection of that equity.

Before moving on, it is worth pointing out that in urban Himachal Pradesh one aspect of gender equity - equal probabilities of females and males of opting for under-graduate education – results in gender equity in outcomes in under-graduate education because of prior equity in higher secondary education. Put differently, it is because there is gender equity in higher secondary education that equal probabilities of opting for under-graduate education result in equity at that level as well. Prior inequity would require a gender probability gap in favour of females to be able narrow or close that equity gap.

As far urban WB is concerned, urban Himachal Pradesh's experience suggests two lessons: First, despite the fact that it has a substantially lower urban female probability of opting for under-graduate education than WB (the gap between the two is 0.19) it still has a higher share of urban female graduates[56] because of a much greater share of urban females who have completed higher secondary education. In other words, beyond a point, high probabilities will not be able to overcome a large base effect, particularly when the variance in shares is high, as in the case of female higher secondary education.

Second, the importance of low variance among male shares is again underlined in the comparison between Himachal Pradesh and WB. Urban Himachal Pradesh has a higher share than WB of males with at least a higher secondary education, but given the low variance in male shares in our sample, the gap between the two is small[57]. Therefore even though the gap between male probabilities of opting for under-graduate education in urban WB and Himachal Pradesh (0.06) is significantly smaller than the equivalent

[54] In our sample, it has the highest share of the 15+ urban female population with at least higher secondary education and the 2nd highest male share.
[55] In our sample, it has the 3rd highest share of the 15+ urban female population with a graduate degree and the 2nd lowest male share.
[56] Urban Himachal Pradesh's share of female graduates is 14.7 as compared with 12.9% for WB.
[57] The Himachal Pradesh share is 31.4 as opposed to 29.7% for WB, gap of 1.7%. The female gap between the two is 13.4%.

female gap (0.19), unlike in the female share, urban WB overhauls Himachal Pradesh and has a higher share of male graduates[58].

It will be recalled that the female and male probabilities in urban WB of opting for higher education broadly defined (either a graduate degree or a diploma holder) after finishing higher secondary are 0.65 and 0.61 respectively. The female probability is higher than the national average and 3rd from the top in our 12-state sample. Whereas the male probability is below the national average and 4th from the bottom (see p16-17 above). On the other hand, the female and male probabilities of opting for an under-graduate education, which are 0.63 and 0.57 respectively, are very differently situated in relative terms. Urban WB's female probability of opting for under-graduate education is the highest in the sample and the male probability the 2nd highest. Both are of course higher than the national average.

Differences between urban WB's female and male probabilities of opting for higher education broadly defined and under-graduate education as well as the change in the relative positions (of these probabilities) is explained by the nature of post-higher secondary preferences for an under-graduate education as compared with a diploma programme.

The probability that an urban WB female, if she chooses (and is able) to continue after higher secondary education, will opt for an under-graduate college education over a diploma programme is practically 1 (0.98). This explains why there is very little difference between the urban female probability of opting for higher education broadly defined and that of under-graduate education. The equivalent male probability is a shade lower at 0.93. Both probabilities are higher than the respective national averages, which are 0.88 and 0.82. Therefore in urban WB both females and males have a very strong preference for under-graduate college education over diploma programmes and these are somewhat higher than the respective national average.

For its comparators the probability that an urban female, if she chooses (and is able) to continue after higher secondary education, will opt for an under-graduate college education over a diploma programme is as follows: Andhra Pradesh is 0.86; Tamil Nadu is 0.88; Maharashtra is 0.8; Himachal Pradesh is 0.76; and Delhi is 0.94. Kerala has the lowest probability of 0.66. Therefore even though the preference for under-graduate college education is high for most of its comparators, clearly WB and Delhi have the highest and are similar to each other in this regard and have much stronger preferences than Himachal Pradesh and Kerala.

For WB's comparators, urban male probabilities of opting for under-graduate college education over a diploma programme are as follows: Andhra Pradesh is 0.77; Tamil Nadu is 0.78; Maharashtra is 0.74; Himachal Pradesh is 0.71; and Delhi is 0.92. Kerala has the

[58] Urban Himachal Pradesh's share of male graduates is 13.5 as compared with 16.8% for WB. The low variance also affects relative positions. Urban Himachal Pradesh goes from having the 2nd highest share of males with at least higher secondary education to the 2nd lowest share in our sample of males with a graduate degree. Urban WB moves to having the 2nd highest share of males with a graduate degree.

lowest probability of 0.55. There are a couple of points that emerge. First, again WB and Delhi have very similar and high urban male preferences for under-graduate education. Second, outside of Delhi, in terms of urban male preferences, WB is quite different from its other comparators, which have a relatively lower preference for under-graduate education.

Conclusion 38: As in other levels of education, gender discrimination in under-graduate education in urban WB in particular and urban India in general, is much lower than in respective rural geographies.

Conclusion 39: Unlike rural areas, in urban WB, gender discrimination against females declines, even if marginally, across all three levels of education – higher secondary, higher education broadly defined and under-graduate education.

Conclusion 40: In urban WB, unlike at any other level of education, both female and male shares of graduates in the 15+ population are not only higher than their respective national averages, but are also amongst the best performers in our 12-state sample.

Conclusion 41: Urban WB performs significantly better in terms of gender equity than its comparators with similar household income distributions – Tamil Nadu and Andhra Pradesh. With two comparators with negatively skewed income distributions – Maharashtra and Delhi – it is almost on par. However from Himachal Pradesh, which has no gender discrimination in under-graduate education, it is still some distance away.

Conclusion 42: In relative terms urban WB females have performed better than their male counterparts in terms of attaining graduate degrees.

Conclusion 43: The improvement in both the absolute and relative performance is largely due to the fact that both females and males in urban WB have amongst the highest probabilities of opting for under-graduate education amongst our 12-state sample.

Conclusion 44: As in higher education broadly defined, urban females in WB have a higher probability of opting for under-graduate education than urban males. However the gender probability gap in favour of females is higher in under-graduate education than in higher education broadly defined.

Conclusion 45: Despite the fact that urban male probability in WB is lower than female, it has a greater clout (vis-à-vis the female probability and female shares) in determining WB's relative position in our sample in terms of shares of urban male graduates

Conclusion 46: This greater clout comes from prior gender discrimination against females across all states in our sample in higher secondary education, i.e., urban male higher secondary shares are higher than female and much closer to each other in our sample.

Conclusion 47: Therefore the lower (than female) urban male probability of opting for under-graduate education is relatively much more effective in overcoming the low base in higher secondary education that both females and males suffer from in urban WB.

Conclusion 48: Urban WB's probabilities of opting for undergraduate education, both male and female, as very similar to urban Delhi's.

Conclusion 49: Urban WB's high probabilities of opting for under-graduate education, both female and male, are explained by exceedingly high preference for under-graduate education over diploma programmes. In this again, urban WB, as in the rural instance, is very similar to urban Delhi.

Conclusion 50: Except, Himachal Pradesh and Kerala, where they are relatively lower, urban female preference for under-graduate education as opposed to diploma programmes is high in WB's comparators as well (though lower than WB).

Conclusion 51: Urban male preference for under-graduate education as opposed to diploma programmes is distinctly lower than WB in all of its comparator states other than Delhi.

VI: Educational outcomes and preferences: do they matter?

One of the conclusions that we arrived at the end of the discussion on higher education was that WB performs very poorly, relative to both the national average and other middle and high income states, in terms of the share of the population with at 'least higher secondary education' as well as that with higher education broadly defined. Therefore somewhat surprisingly however, it performs relatively much better[59] in terms of the share of the population with graduate degrees.

One reason for this improvement is the relatively high probability, in both rural and urban WB, of opting for under-graduate education. Underlying this high probability is an exceedingly high preference for under-graduate education vis-à-vis diploma programmes. It is a preference pattern that it shares with Delhi but with no other middle or high income state and is different from the national average as well.

The question then arises whether this pattern is idiosyncratic or linked to or correlated with other factors such as PCY or HD. If there is a link or a correlation, what is its nature? Rightfully, these issues require a separate study, but we felt that it might be useful to begin a preliminary discussion. To that end we ran a set of rank correlations to see if any further patterns emerge that might help in a more elaborate analysis of these issues.

First we ranked our 12-state sample in ascending order for the three aggregates we defined in Section I – at least higher secondary education; higher education broadly defined; and at least graduates. In addition we also ranked them according to the share of

[59] See fn.19 above for a comparison of the relative performance of the three educational aggregates.

the population with only primary education; only diploma holders; state per capita income; and HDI. Results are reported in Table 4. It will be noticed that we do not have HDI ranks for Delhi and Himachal Pradesh. Therefore we repeated the ranking exercise for HDI but without Delhi and Himachal Pradesh. Results are reported in Table 5.

We then ran two sets of rank correlations using MS Excel. One set explores correlations between education attributes and per capita incomes. Each pair-wise rank correlation is based on 12 observations using data from Table 4 and results are reported in column 2 of Table 6. The second set explores correlations between education attributes and HDI. Each pair-wise rank correlation is based on 10 observations using data from Table 5 and results are reported in column 1 of Table 6. The results make interesting reading.

Table 4: Ranks according to educational status, per capita income and HDI

	Higher Secondary and above Rank	Diploma or Graduates Rank	Graduates Rank	Primary only Rank	Diploma Rank	per capita income Rank	HDI rank
Andhra Pradesh	2	2	2	3	4	3	1
Delhi	12	12	12	1	7	12	
Gujarat	5	5	7	8	6	8	5
Haryana	8	9	10	7	5	9	6
Himachal Pradesh	7	5	3	10	10	5	
Karnataka	4	4	4	5	3	6	4
Kerala	11	11	5	9	12	4	10
Maharashtra	9	10	11	4	11	10	7
Punjab	9	7	8	6	9	11	9
Rajasthan	1	1	1	2	2	1	2
Tamil Nadu	6	7	9	10	8	7	8
West Bengal	**3**	**3**	**5**	**12**	**1**	**2**	**3**

Note: Ranks in ascending order, e.g., West Bengal has the highest share of the 15+ population with only primary education and Delhi the highest per capita income

Table 5: Ranks without Delhi and Himachal Pradesh

	Higher Secondary and above Rank	Diploma and Graduates Rank	Graduates Rank	Primary only Rank	Diploma Rank	HDI rank
Andhra Pradesh	2	2	2	2	4	1
Gujarat	5	5	6	7	6	5
Haryana	7	8	9	6	5	6
Karnataka	4	4	3	4	3	4
Kerala	10	10	4	8	10	10
Maharashtra	8	9	10	3	9	7

Punjab	9	6	7	5	8	9
Rajasthan	1	1	1	1	2	2
Tamil Nadu	6	6	8	9	7	8
West Bengal	**3**	**3**	**4**	**10**	**1**	**3**

Table 6: Pair-wise rank correlations between education status and HDI and PCY

	1	2
	HDI	Per capita income (PCY)
Higher Secondary and above	0.95	0.75
Higher education broadly defined (Diploma or Graduates)	0.89	0.74
Graduates and above	0.64	0.86
Primary only	0.44	-0.25
Diploma	0.87	0.47
One-tail critical values (1%)	**0.71**	**.66**
One-tail critical values (5%)	**0.55**	**.50**

The highest correlation of PCY is with the share of the population with graduate degrees or above (0.86). This is closely followed by shares of the population with 'at least higher secondary education' (0.75) and with higher education broadly defined (0.74). All three correlations are significant at the 99% confidence level. The share of diploma holders has a relatively low correlation with PCY. That result however is not significant at the 99% confidence level.

On the other hand, the highest correlation of HDI is with the share of the population with 'at least higher secondary education' (0.95) closely followed by the share of the population with higher education broadly defined (0.89), followed by the share of diploma holders (0.87). All three correlations are significant at the 99% confidence level. The correlation of HDI with the share of graduates is much lower (0.64). The correlation however is not significant at the 99% confidence level.

It would then not be unreasonable to infer that whereas all three levels of education have a reasonably strong positive association with PCY levels, the share of the population with 'at least higher secondary education' has a much stronger positive association with HD levels, followed by the shares of higher education broadly defined and diploma holders. Therefore it would appear that the preference pattern between undergraduate programmes and diploma programmes might matter for HD levels much more than for income levels.

Given that our sample sizes are relatively small (10 and 12), we decided to test HDI[60] and PCY correlation with educational status over a somewhat larger sample of 43 countries. The sample ranges from a PPP per capita income in 2006[61] from $59,560 for

[60] Rankings of HDI based on data from **Human Development Report 2006** which reports indicators based on 2004 data.

[61] Taken from World Development Indicators database, World Bank, 14 September 2007, available at http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf

Luxembourg and $44,260 for the USA to $3,950 for Indonesia. The countries in our sample are as follows (they have been arranged in descending order in terms of PPP 2006 per capita incomes): Luxembourg, United States, Norway, Switzerland, Netherlands, Iceland, Denmark, Ireland, United Kingdom, Finland, Austria, Belgium, Sweden, Canada, Australia , France, Japan, Germany, Italy, Spain, New Zealand, Israel, Greece, Korea, Portugal , Czech Republic, Hungary , Slovak Republic, Argentina, Poland, Russian Federation, Mexico, Malaysia, Chile, Uruguay, Thailand, Turkey, Brazil, Jordan, Peru, Philippines, Paraguay, Indonesia.

Table 7: Pair-wise rank correlations between education status and HDI and PCY		
	1	2
	HDI	PPP Per capita income
Upper Secondary and above[62]	0.59	1.00
Tertiary education	0.67	0.63
University	0.63	0.59
One-tail critical values (1%)	**0.37**	**0.37**
One-tail critical values (5%)	**0.26**	**0.26**

Our larger sample suggests that PCY levels and the share of the population with 'upper secondary education and above' (equivalent to our aggregate 'at least higher secondary education') are very strongly correlated. In fact they are perfectly correlated. The associations with the other two education levels are not as strong. All three correlations however are statistically significant at the 99% confidence level.

As far as HDI is concerned all three educational levels have reasonably strong and similar correlations. And all three correlations are statistically significant at the 99% confidence levels.

What then can we infer at the end of these statistical exercises?

First, the share of the population with 'at least higher secondary education' has a robust and high correlation with PCY levels. This correlation is higher than those associated with other levels of education.

Second, the composition of diploma holders and graduates in the share of higher education broadly defined has a greater impact on human development than on income levels – with the higher share of diploma holders having a stronger positive correlation with HD than the higher share of graduates. Therefore, it would appear that preferences as between diploma programmes and under-graduate studies matter more for human development than for per capita income levels, though they affect (or are affected by) both. It must be stressed that there is no causation that is being implied whatsoever.

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[62] Education status data taken from **Table A1.2a** (Percentage of Population that has attained at least upper secondary education1 (2003)) and **Table A1.3b** (Percentage of (25-64) Population that has attained tertiary education (2003)) in **OECD Education at a Glance 2006**.

Finally, the correlation of the population share with 'at least higher secondary education' and HD levels is at least as strong as, if not stronger, than that with other levels of education.

It goes without saying that each of these conclusions would need to be explored in much greater detail before taking a firm view on the matter.

In light of the above, however, WB's low share of the population with 'at least higher secondary education' as well as its exceedingly high preference for under-graduate education as opposed to diploma programmes become much more a cause of worry. Clearly, some of the impact of a low share of 'at least higher secondary education' is mitigated by the high probability of opting for under-graduate education after finishing higher secondary, resulting in a relatively high share of graduates in the population. And as our analysis suggests, the share of graduates has a strong association with per capita incomes, even though it may not be as strong as that of the share with 'at least higher secondary education'.

But, first, given the much stronger association of PCY levels and share of the population with 'at least higher secondary education', clearly things would be much better if WB had a much higher share of the latter, particularly in light of its high probability of opting for under-graduate education. Second, if there is indeed a stronger relationship between HD levels, as compared with PCY levels, and the share of diploma holders in particular (or that of higher education broadly defined in general), then is it the case that because of the high preference for under-graduate education vis-à-vis diploma programmes, what WB gains on the swings it loses on the roundabout? Or put differently, is it the case that the high preference for under-graduate education aids per capita income growth but relatively retards human development. Again, given the high probability of opting for under-graduate education, a higher share of the population with 'at least higher secondary education' might be one way out of this dilemma given that it has a much stronger association with per capita income levels and that it has at least as strong, if not stronger, an association with HD as that of other levels of education.

VII: In lieu of a conclusion

To conclude this somewhat lengthy but nevertheless preliminary inquiry into higher education in WB we will highlight some of our main findings and make a few policy recommendations in that light.

First, for a middle income state, WB's share of the 15+ population with 'at least higher secondary education' is very low. It is not only amongst the lowest in our 12-state sample of middle and high income states, but it is also lower than the national average. The same relative standing is repeated in the instance of higher education broadly defined. However WB's share of graduates in the 15+ population turns in a very different relative performance – it is not only higher than the national average but also close to the median value of our 12-state sample.

WB's turnaround in the performance of the share of graduates comes as a result of very high probability of opting for under-graduate education after finishing higher secondary. In other words, the high probability mitigates the impact of the low base in higher secondary education. WB's probability of opting for under-graduate education is not only higher than the all-India average, but amongst the highest in our sample, topped only by Delhi. This high probability is underpinned by an exceedingly high preference for under-graduate education vis-à-vis diploma programmes as a post-higher secondary choice. In this preference pattern, WB is similar to Delhi, a state whose per capita income is 5 times WB's. And, in this, both WB and Delhi are dissimilar not only from the national average, but also from other middle and high income states in our sample.

Second, in terms of educational qualifications, rural and urban WB are very different from each other and there is a huge gap between the two. Even though this characterises India in general and all states in our sample, the gap between rural and urban WB is the highest amongst our sample and across all three levels of education – at least higher secondary, higher education broadly defined and under-graduate.

Rural: Among rural geographies in our sample, rural WB has amongst the lowest shares across all three levels of education. The relatively high probability of opting for under-graduate education is unable to improve rural WB standing in graduate education because the share of the population with at least higher secondary education is so low and the gap with other states in our sample so high. That is to say, rural WB proves that beyond a point high probabilities cannot mitigate the impact of a low base in higher secondary education. In rural WB as well, high probabilities of opting for under-graduate education are under-pinned by a extremely high preference for under-graduate education vis-à-vis diploma programmes and in this rural WB is an outlier in our sample.

Rural WB performs poorly in terms of gender equity. Discrimination against females across all three levels of education in rural WB is amongst the highest in our sample, alongside Andhra Pradesh. Only Rajasthan has a worse record. Gender discrimination in rural WB is also significantly higher than the average for rural India. Rural Kerala is the only state in our sample where there is no discrimination against females in higher secondary and under-graduate education.

Gender discrimination worsens in rural WB between 'at least higher secondary education' and graduate degree holders because the gender probability gap in opting for under-graduate education is against females and amongst the widest in our sample (only Rajasthan is wider). Despite the gap, the high preference for under-graduate education vis-à-vis diploma programmes cuts across gender.

Rural Tamil Nadu, a middle income state with a very similar rural household income distribution to WB's, performs much better than rural WB in terms of both the rural-urban gap and gender equity. In terms of occupational structures of the rural economy, the two are differentiated by the share of other labouring households (OLH). Rural Tamil Nadu has almost twice the share of WB. It is worthwhile exploring whether there is a link between this and Tamil Nadu's improved performance.

Urban: The urban geographies in our sample look and feel very different. For starters, the differences across urban geographies are much smaller across all three levels of education, indicating perhaps a higher urban 'preference' for education. One possible reason is that the occupational structure across urban geographies in our sample is far more similar and better as compared with rural. The modal occupational category in urban geographies in our sample is 'regular employment', followed by 'self-employment'.

In urban WB, the high probability of opting for under-graduate education plays an important role in the improved absolute and relative performance in terms of the share of graduate degree holders. As a result of the high probability, in our sample, urban WB goes from having amongst the lowest shares of the population with 'at least higher secondary education' to amongst the highest shares of the population with a graduate degree, topped only by urban Delhi. A reason why the high probability is so much more effective, unlike in rural WB, in improving urban WB's relative performance is that urban geographies are so much more similar to each other than rural. That is, shares of the population with 'at least higher secondary education' are much closer to each other in urban geographies, giving WB's high probability of opting for under-graduate education much more relative heft.

The improved performance means that urban WB, along with a couple of other states in our sample including Delhi, has a share of the population with graduate degrees that is comparable to OECD levels. Indeed, Delhi is comparable to OECD best performers.

Gender discrimination is substantially lower in urban geographies across all three levels of education. Indeed, there are 2 states in our sample – Punjab and Himachal Pradesh - where there is no gender discrimination at any of the three levels of education. And in urban Kerala there is no gender discrimination in attainment of graduate degrees.

In urban WB too gender discrimination is significantly lower than in rural. In addition, in under-graduate education, lower than the national average. There is in fact an improvement in gender equity in urban WB between the two education levels – 'at least higher secondary' and 'graduate degrees and above'. This is because the gender probability gap in urban WB in opting for under-graduate education is in favour of females (i.e. the probability of an urban female opting for under-graduate education is higher than that of a male), and works towards lowering inherited levels of gender discrimination, but is unable to wipe it out altogether. As a result of the gender probability gap in favour of females urban WB performs much better in terms of gender equity than its comparators with similar household income distributions

But gender discrimination is also reflected in the fact that, across geographies and education levels, male shares of the population at various levels of education are far more closely clustered together than female. Therefore, despite the fact that in urban WB, the male probability of opting for under-graduate education is lower than the female, prior

gender discrimination means that the male probability is significantly more successful in improving relative performance in attaining graduate degrees.

In urban WB as in rural, high female and male probabilities of opting for under-graduate education after completing higher secondary are predicated upon an exceedingly high preference, across gender, for under-graduate education vis-à-vis diploma programmes. Again in this it is very similar to Delhi. But unlike rural WB, it is not an outlier – in our sample urban preferences for under-graduate education vis-à-vis diploma programmes tend to higher than rural. However, urban WB and Delhi have the highest preference for under-graduate education amongst our 12-state sample of middle and high income states.

Finally, our statistical exercises suggest that the share of the population with 'at least higher secondary education' is much more closely and robustly associated with per capita income levels, than the share with either 'higher education broadly defined' or 'graduates and above'. They also suggest that the share of diploma holders in particular and that of 'higher education broadly defined' in general is more closely associated, than the share of graduates, with human development levels. In which case, despite WB surprising performance in terms of graduate education, particularly in urban areas, both its low share of the population with at least higher secondary education and its high preference for under-graduate education become problematic.

In light of the above, we have the following policy recommendations to make for WB:

(a) Focus on raising the share of the population with at 'least higher secondary education' across both rural and urban geographies and gender.
(b) Focus on closing the rural-urban gap and on lowering the rural gender bias against females.
(c) Focus on increasing the probability of opting for higher education broadly defined in rural areas.
(d) In particular, focus on improving the probability of rural females opting for higher education broadly defined and for under-graduate education, both of which are significantly lower than that for males.
(e) Explore in greater depth the relationship between preference patterns for higher education broadly defined on the one hand with human development and per capita income levels on the other.
(f) A reasonable target would be for WB to reach median values of our sample of middle and high income states across both geographies and gender in share of the population with 'at least higher secondary education'.

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