Poverty Profile for Morocco: Annotated Outline

1. Choice of welfare measure

- Per capita household expenditures were chosen as an indicator of household well being.
- One alternative measure could have been household income. However income is difficult to measure and less accurate than expenditure data. See Deaton (1997).
- Another alternative would be to use the expenditure per adult equivalent. Morocco has not developed a country specific equivalence scale.

2. Determination of the poverty lines

- The methodology used by the Moroccans in the determination of the poverty line is similar to the methodology implemented in 1994 for computing the poverty line based on the LSMS90 data (see the annex to the 1994 Bank report for a detailed description of the methodology). A note provided to us by the Statistical Mission to WB HQ describes in detail what was done for 1998 (see paper entitled *Synthèse: approche et tendance de la pauvreté*). Note that the figures as presented in this paper have been revised to take into account minor computational mistakes in the calculations provided by the Moroccan Statistics Office.
- Table 1 below presents the lower and higher poverty lines for both rural and urban areas computed with the following two methods: (i) CPI update of the food-component of the poverty line and re-estimation of the non-food component of the poverty line[1] (ii) CPI update of the 1991 poverty lines[2]. At the request of the Moroccans the poverty lines used in the analysis are those obtained with method (i). For tabulation, the <u>upper poverty line</u> was considered as the reference.
- Refer to the 1994 report for information on the 1991 survey sampling methodology. For the 1998 survey, a note has been produced by the Moroccan Statistics Office and is attached to this outline. Also see tables 0.1 to 0.4 for a description of the 1998 sample.

Table 1 - Poverty Lines for 1998/1999 (DH/person/year)

	Lower Poverty line	Upper Poverty Line
Urban	(i) 2881 (ii) 2833	(i) 3992 (ii) 3667
Rural	(i) 2553 (ii) 2628	(i) 3037 (ii) 3140

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[1] Based of the model $w = \alpha + \beta \log(x/z) + u$ where w = the food share in total expenditure, x = the annual total per capita expenditure, z = the food poverty line, u = the residual.

[2] Using two price deflators: one for urban areas, and the other for rural areas.

3. Aggregate poverty measures

- Tables 1.7, 1.11, 1.12 and 1.20 to 1.24 present poverty indices at the national level as well as for rural/urban areas.
- Poverty is significantly higher in rural areas with respect to each of the poverty measures presented (P0, P1, P2)

4. Poverty by region of residence (tables 1.10 and 1.12)

- Warning : the sample was not designed for a regional regional breakdown of poverty indices. All tables disagregated at a level below urban/rural must be interpreted cautiously. See the distribution of the sample by region in table 0.2.
- The overall incidence of poverty is highest in Mekmes Tafilk and Fes-Boulmane with 28% of people living below the poverty line (table 1.12)
- The contribution to poverty is highest in Tensift Alha with 14.9% of the total poor living there (table 1.10)
- Note that the above is for the upper poverty line. The robustness of the results to the choice of poverty lines could be tested using poverty incidence curve analysis.

5. Sector of employment/ professional status

- Note that we did not receive the information necessary to understand the coding of the branch of activity and main occupation variables (section 6D - questions 2 and 3) . We nevertheless produced tables that should be updated once this information is available.
- Tables 2.9-2.16 presents the results. Note that it seems likely that 'Branche 0' is the agricultural sector.
- At the national level, the unemployed are the category with the highest percentage of poor (30.5%) followed by 'Branche 0' (i.e. agriculture?) and such ranking is maintained both within urban and rural areas (tables 2.11-2.13).
- At the national level the highest number of poor works in 'Branche 0' (45.2%) followed by 'Branche 1-9' as a whole. However the urban breakdown highlights the overwhelming prevalence of the poor in the Branches 1-9 (57.5%).
- In the rural sector 'Branche 0' is where almost 66% of the total poor are engaged.
- Tables 2.1-2.8 present results according to the professional status of the household head. The most notable feature of such breakdown is the concentration, at the national level, of the poor in independent (agriculture?) (50.2%) and salaried activities (34.7%).
- Looking at the rural/urban distribution of the poor it is important to notice that 42.5% of the poor in urban areas are employed in salaried activities while in rural areas almost 60% of them are independent workers.

6. Household budgets

- Tables 3.1-3.8 present budget shares for each decile of the population and by region/area of residence. [3]
- Poor households spend 80% of their total budget in food and housing/energy (table 3.2).
- While both food and housing expenditure behave as 'necessary goods' i.e. their share decreases as total expenditure increases, health, transport and clothing present the reverse pattern as their share increases with expenditure i.e. 'luxury goods (tables 3.5 to 3.7).

7. Demographics

- Poorer households tend to have the higher household size in Morocco (tables 1.13 and 1.16). However see the last paragraph on this note for a sensitivity test of such results to economies of scale.
- 16.7 % of household are female headed and tend to be relatively more concentrated in urban areas (table 1.27). Out of these female headed household, 10.7% are poor and account for 12.1% of the total number of household that live below the (upper) poverty line (table 1.26).

8. Housing

- Tables 4.1.a to 4.10.a present results extrapolated at the household level. Tables 4.1.b to 4.10.b present results extrapolated at the population level.
- 34.4% of the population lives in modern urban housing and 31.0% in rural 'pisé/pierres' housing. The latter housing type is most prevalent among the poor (54.4%) (tables 4.1.b-4.2.b).
- In rural areas the most common mean of garbage and used water disposal is to ' throw it in the nature' (tables 4.5.b to 4.8.b).
- Over two thirds of the poor own their house (table 4.3.b). Note also that the incidence of free housing is relatively higher for better off households (table 4.12).

9. Electricity and water

- Electricity is scarce in rural areas: only 15.8% of the population has it compared with 85.5% in urban areas (table 8.3b). Taza Alho. Ta is the region with the least proportion of population with electricity 26.8% (table 8.5.b).

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[3] NOTE : Deciles presented in the tables are deciles of <u>population</u> (not households), based on the per capita expenditure. Two sets of deciles have been computed : one at the national level (<u>without</u> any adjustment made to the expenditure despite the different urban/rural price levels ; this set of deciles corresponds to the deciles/quintiles used in tables produced by the Moroccan Statistics Office), and one at the urban/rural level (where deciles have been computed separately for the urban and rural households).

- 70.5% of the poor have no electricity (table 8.1.b).
- Lack of access to tap water is particularly sever in rural areas where 94.7% of the households are without it (table 49.a). The situation improves in urban areas where only 21.6% of households have no access to tap water. However while poor households are not so worse of than the average in rural areas, the situation is quite different in urban ones where 42.3% of poor households have no access to tap water.
- At the regional level Taza Alho. Ta is where the situation is relatively worse with 77.1% of households with no tap water followed by Gharg-Charda with 70.3%.
- Looking at availability of tap water by poverty status (table 4.9.a) it is worth noting the lower access of poor households in urban areas if compared to non-poor ones: 57.7% vs 80.4%. In rural areas on the contrary there is almost no difference in access but this is mostly due to the very low availability of tap water as a whole.

12. Education

- Tables 1.28 to 1.39 report the education status of the head of household by expenditures decile and poverty status. The linkage between lack of education and poverty is quite evident. At the national level, 64.3% of the poor have no education and 17.5% have only primary education (table 1.35). Such pattern is similar both in rural and urban areas albeit stronger in rural ones.
- Tables 5.16 to 5.25 present school enrollment ratios by different sub-groups. While the national average is .56 there is a marked difference between rural and urban areas (.39 and .75 respectively) (tables 5.17 to 5.18.) Such difference is relatively stable across all the deciles of expenditures (table 5.24). Note that these tables refer to the combined primary and secondary school enrollment ratio. Tables will have to be produced separately for the primary and secondary school.
- Across regions Taza Alho. Ta fares considerably worse with .40 (table 5.20).
- There is also a gap between male and female ratios with .63 and .50 respectively. (table 5.21). Such gap is stronger in rural areas across decile of expenditures (table 5.25)

13. Health

- 16.5% percent of the population has been sick/injured in the 4 weeks prior to the interview (19.2% in urban areas, 13.3% in rural areas; table 6.3).
- Sickness/injuries seem to be much more frequent to rich households compared to the poor. Only 8.6% of the population in the first decile reported a sickness/injury in the 4 weeks prior the interview, compared to 26.8% for the last decile. It is very likely that the concept of sickness/injury was different for the rich and the poor.
- Dispensaries are the most common place for consultation by the poor (31.9% vs 14.8 for the non-poor). Private doctors are preffered by the non-poor (47.1% vs 20.5 for thye poor) (table 6.13).
- Almost all of the rural population has no health coverage (96.6%) while this is true for 79.0% of the urban one (table 6.16).

- 98% of the poor vis a vis 84.7% of the non poor have no health coverage (table 6.17).

14. Priority needs as identified by households

- Tables 7.3 to 7.5 present the responses given by households to what they perceive as priority needs.
- Note first that within rural and urban areas the responses of the poor and non poor give relatively similar responses.
- More importantly the emphasis placed in rural areas for an improvement of basic infrastructure and services is quite evident. Among the rural poor the ranking of priorities is as follows: electricity, roads, dispensary, potable water, schools, transportation.

15. Inequality

Table 2.a below presents the Gini coefficients both at the national level and for urban and rural areas separately.

Table 2.a - Gini coefficients

	National	Urban	Rural
Gini Coefficient	.39	.37	.31

Table 2.b below presents inequality measures decomposed along different household groupings. How much of the overall inequality is due to differences within each sub-group and how much is due to difference between such groups? Table 2.b shows that the in urban and rural areas the largest source of inequality is that within each area with only about 20 % of overall inequality in average expenditure due to differences between the two. Similarly, only 9% of overall inequality is due to differences between regions.

(For an explanation of the 2 Theil measures used here and for a better understanding of the resluts see Dollar and Glewwe: *Poverty and inequality in the early reform period*. In "*Household welfare and Vietnam's Transition*" edited by Dollar Glewwe and Litvack, 1998, World Bank.

Table 2.b - Inequality in Morocco in 1997/87

Group or Region	Inequality Measure		Between Group inequality (as a % of total inequality)		Population Share %
	Theil T	Theil L	Theil T	Theil L	
All Country	0.2846	0.2580			
Urban/Rural					
Urban	0.2560	0.2322	0.0540	0.0571	54.0
Rural	0.1709	0.1639	(18.9)	(22.1)	46.0
Region					
Regions Sud	0.2911	0.2861	0.0256	0.0237	2.3
Sous-Massa-D	0.2597	0.2403	(9.0)	(9.1)	10.2
Gharg-Chrarda	0.2939	0.2667			6.1
Chaouia-Ourd	0.1888	0.1775			5.3
Tensift Alha.	0.3136	0.2760			10.4
Oriental	0.2020	0.1942			7.2
G.Casablanca	0.2655	0.2275			11.0
Rabat-sale' ZZ	0.2744	0.2491			8.2
Doukala	0.1968	0.1787			6.7
Tadla Azilal	0.2409	0.2190			5.4
Mekmes Tafil	0.3024	0.2579			6.7
Fes-Boulmane	0.2930	0.2564			5.5
Taza Alho. Ta	0.2745	0.2575			6.5
Tanger-Tetouan	0.2050	0.2019			7.8
Education of the H. head					
No level	0.2028	0.1915	0.0692	0.0548	52.6
Primary	0.2448	0.2283	(24.3)	(21.2)	23.0
Secondary	0.1831	0.1770			4.8
University	0.2217	0.2492			2.9
Parallel System	0.2206	0.2048			16.4

16. Growth prospects.

- What is the impact of future growth on poverty reduction ? Suppose that over the next 10 years there is no change in relative inequalities, thus all consumption levels increase at the same rate. For the 1998 distribution the elasticity of the head-count index with respect to the mean is about 2.3[4] (table 3 below). This implies that an increase in mean consumption of 25% (which implies an average growth rate of 2.2%) over the next ten years would reduce poverty by 57% reducing the head count index to about 8% at the end of the period.
- The results also show a higher sensitivity of the poverty gap and squared poverty gap to growth in income than the head count with elasticities above 3 and 4 respectively. Moreover all elasticites are higher for the lower poverty line. The decline in poverty would then be even higher for measures of poverty and poverty lines more focussed on the poorest.
- NOTE: the choice of a 25% increase is entirely arbitrary. It would make sense to use the expected increase over the next 10-15 years as forecasted by recent estimates which we imagine should be available from the live data base or from the country economist. We would thus recommend to use the expected real increase in mean consumption per capita and change the figures accordingly.

Table 3. Elasticities of the 1998 Poverty measures to growth in mean consumption

	Higher poverty line (range)		Lower poverty line (range)	
P0	-2.28	-2.40	-3.06	-3.33
P1	-3.26	-3.42	-4.27	-4.60
P2	-4.06	-4.24	-5.20	-5.54

17. Economies of Scale

- We performed a robustness test to assess the potential relevance of economies of scale in consumption. The hypothesis tested is that large households may have a distinct advantage over smaller ones as they can benefit from sharing commodities or purchasing products in bulk which may be cheaper. Note that economies of scale are independent from the age structure of the household and thus quite distinct from adult
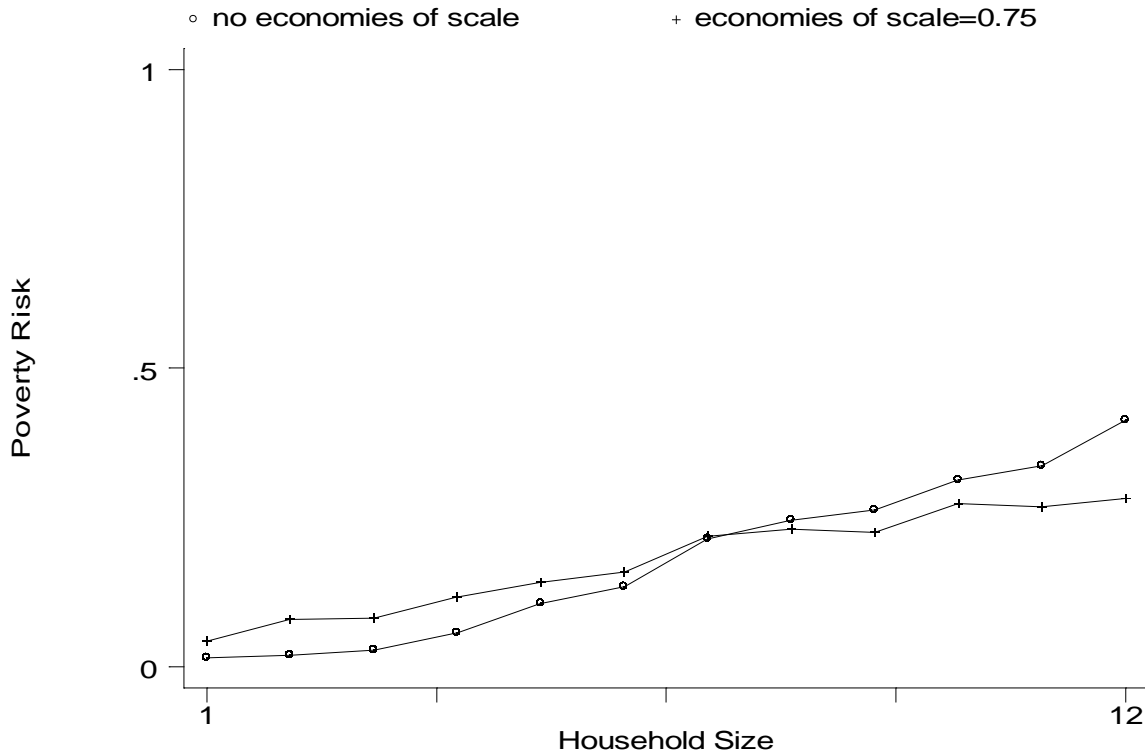
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[4] The figures reported in table 3 were estimated by calibrating a Beta Lorenz curve to the data using POVCAL. Note that the table reports ranges and not point estimates. As POVCAL works with grouped that it may be the case, as it is for Morocco, that the estimates differ slightly from those derived directly from the household survey. Thus we performed a sensitivity analysis of the results by varying the poverty line to the point where POVCAL estimates were in line with the results obtained directly from the household level data for the head count index . we therefore present the results obtained in POVCAL both with the official poverty line and by adjusting it to obtain the same headcount. For the purposes of the analysis the ranges presented are sufficiently small to offer a reliable indication of the potential changes in poverty due to an increase in mean consumption expenditure.

equivalency scales which derive from differing needs of different household members.

There is no single agreed methodology for the estimation of economies of scale. Thus to assess their importance we chose a value of theta of 0.75. This derives from the transformation of household expenditures (E) in per capita terms as follows:

$$E_{pc}=E/(n^{\theta})$$

where n is the household size and θ is the scale parameter. If θ is equal to 1 no economies of scale are assumed; while for values of θ approaching 0 the higher is the assumed effect of economies of scale. Thus, our choice of 0.75 allows for a relatively small presence of economies of scale.

To investigate the relevance of economies of scale in Morocco we first choose a poverty line that generates the same national poverty rate as if we were to use the unadjusted data. Once we have identified the subset of poor and non poor households in both sets of data we compute the poverty risk per household size and compare the adjusted results to the non-adjusted ones. The results are presented in graph 1. As expected adjusting for economies of scale has a flattening impact on the poverty/household size curve. While large households are still more likely to be poor the difference between larger and smaller households is smaller.

To pursue this robustness tests further, it may be useful to investigate the effects of equivalence scales on poverty outcomes. Morocco has not developed yet a country specific equivalence scale thus scales used in other countries could be used.

18. Data issues

Several issues should be addressed in the near future concerning the reliability of the data provided:

- The Moroccan Statistics Office should provide an explanatory note on how the consumption aggregates have been constructed. From our discussions it appears that the same methodology followed in 1991 was implemented in 1998 but it would be worth to investigate the issue further as it is crucial for comparisons over time.
- The Moroccan Statistics Office should compute the aggregated annualized income per household, per source of income (wages / transfers / farm and non-farm enterprises, transfers, etc).
- Data from some sections of the questionnaire need further editing.
- For several variables we did not receive sufficient information with respect to the codes implemented. Most notably we did not receive a valid explanation for the 'sector of employment' variables and thus could perform only very limited analysis along those lines.

19. Issue on the sampling methodology and weighting coefficients

Based on a recent and reliable sample frame (the 1996 population census), a sample of 5131 households has been selected. For each household, a weighting coefficient has been computed. This coefficient is available in variable *coef_ext*.

Using *coef_ext*, the total number of households in the population my be extrapolated by computing the unweighted sum of *coef_ext*. The extrapolated number of households at the national level is 4,643,988.

Coef_ext could also be used to extrapolate the population, by computing the sum of the weighted household sizes (= sum(household size x *coef_ext*)). By doing this, the national population is estimated at **27,498,235**.

Based on the 1996 population census, the population by age and sex has been projected for year 1998. The results from this projection differ from the results of the extrapolation of the 1998 survey data. For that reason, the weighting coefficients from the 1998 survey have been adjusted in such a way that the extrapolated population perfectly matches the census projection.

The household-level weighting coefficient (*coef_per*) has not been adjusted (the census projection is a projection of population, not households). This means that the

extrapolated number of households remains the same. However, a new set of weights has been computed at the individual level. For each household, the weighting coefficient of the head remains the same as the household-level coefficient (*coef_per*). For the other members of the household, these coefficients are different (within the same household, all members may have a different weighting coefficient). This set of individual weights is found in variable *coeffin2* (in individual-level data files only). Also, a new coefficient has been computed to allow the extrapolation of population based on household-level data. This coefficient is found in variable *coef_per*.

The extrapolated population based on these new weights (*coeffin2* or *coef_per*) is **27,971,814**.

Notes :

- The poverty incidence has been computed using both sets of weights (adjusted and non-adjusted). There is no significant difference in the results.
- All tables are based on the "official" weighting coefficients. The following rule apply for using these adjusted coefficients:
    - when working with data at the household level (data on housing or expenditure for example), use *coef_ext* to extrapolate the number of households and *coef_per* to extrapolate the number of people.
    - when working with data at the individual level (data on age, sex, etc), use *coeffin2*.

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