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ACRONYMS AND ABBREVIATIONS

BiH	Bosnia and Herzegovina
BHAS	Bosnia and Herzegovina State Agency for Statistics
CAS	Country Assistance Strategy
CEE	Central and Eastern Europe
CEIT	Community Information and Epidemiological Technologies
CSW	Centers for Social Work
DfID	UK Department for International Development
ECA	Europe and Central Asia
EU	European Union
FBiH	Federation of Bosnia Herzegovina
FDI	Foreign Direct Investment
FIS	Federation of Bosnia and Herzegovina Statistical Institute
GDP	Gross Domestic Product
IBHI	International Bureau of Humanitarian Issues
ILO	International Labor Organization
IMF	International Monetary Fund
KM	Konvertible Marka
LSMS	Living Standards Measurement Study
MoF	Ministry of Finance
MTEF	Medium Term Expenditure Framework
NEAP	National Environment Action Plan
NGO	Non-Governmental Organization
OECD	Organization for Economic Cooperation and Development
OHR	Office of the High Representative
PAD	Project Appraisal Document
PEIR	Public Expenditure and Institutional Review
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
RS	Republika Srpska
RSIS	Republika Srpska Statistical Institute
SFRY	Socialist Federal Republic of Yugoslavia
SME	Small and medium sized enterprise
SOE	State Owned Enterprise
UNDP	United Nations Development Program
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WDI	World Development Indicators
WTO	World Trade Organization

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INTRODUCTION AND ACKNOWLEDGEMENTS

Monitoring their population's welfare or poverty levels helps countries around the world to determine the effectiveness of government economic and social policies. Also, as many government and non-governmental programs are specifically tailored to meeting the needs of the poor, more accurate identification of this group is critical to the targeting of such programs. And, finally, the impact of all social and economic policy on welfare can only be assessed by constant collection of data on well-being in a country.

Measuring welfare requires good micro-level or household data. Such detailed data provide information not just on average levels of welfare (as GDP per capita indicators do), but also on the distribution and characteristics of the rich and the poor. Additionally, such data sources provide insights on factors that affect the ability of the poor to move out of poverty.

In an attempt to answer basic questions about who are the poor in Bosnia-Herzegovina (BiH), what are their characteristics, what is the distribution of wealth, and what are the factors that affect welfare, the Government of BiH, through its three statistical organizations (the State Agency for Statistics [BHAS], the Republika Srpska Institute of Statistics [RSIS] and the Federation of BiH Institute of Statistics [FIS]), undertook the country's first representative multi-purpose household level survey in the latter part of 2001. This survey, the BiH-Living Standards Measurement Study survey [BiH-LSMS], was designed to measure welfare in BiH and to provide information on how welfare levels are correlated with observed social variables such as unemployment, health and education. A fundamental use of the data is to inform the Poverty Reduction Strategy that the Government is in the process of developing and implementing.

This volume represents the results of joint efforts by the Poverty Assessment team and all those who contributed to the successful completion of LSMS: the three statistical organizations of BiH, and especially members of the LSMS team who acted as counterparts, experts and advisors Edin Sabanovic (FIS), Fahrudin Memić (FIS), Mladen Radic (RSIS), Nada Jakovljević (RSIS), Nora Selimović (BHAS), Jovanka Vuković (Public Fund for Child Protection RS), Fadil Suljić (Federal Employment Bureau), as well as Peter Lynn (University of Essex) who provided sampling advice, K.E. Vaidyanathan (UNDP chief advisor) who provided crucial help during the implementation of the LSMS, the UNDP Sarajevo office, especially Armin Sirco and Goran Kurtić, and World Bank staff members and consultants, Ruslan Yemtsov (Poverty Assessment team leader, author of some chapters in this volume), Kinnon Scott (BiH LSMS team leader and a key contributor to many chapters in this volume), Irina Smirnov (World Bank Sarajevo Office), Thomas Mroz (University of North Carolina), Paulette Castel (Consultant) and Jacob Tomse (Consultant).

The purpose of this volume is to describe the methods used to construct a poverty measure in Bosnia and Herzegovina using the BiH-LSMS data set, and to present a detailed poverty profile at the level of the country and of each Entity (i.e., the Republika Srpska [RS] and the Federation of BiH.[FbiH]). All material presented in Chapters 1-7 is closely linked to the analysis of poverty in Volume I, providing details necessary to understand its findings. The first chapter provides a

description of the BiH-LSMS sample design, the survey instruments, the organization of the survey and the definition of key categorical variables. The second chapter provides an overview of the general concepts and issues involved in poverty measurement. Chapters 3 and 4 describe how these concepts have been applied to measure well-being and poverty in BiH. A summary of the key findings on poverty in the country and the two Entities is given in Chapter 5, and various checks of the robustness of these results are presented in Chapter 6. Chapter 7 discusses the use of the LSMS data to study causes of poverty by isolating the impact of a set of key causal factors on the risk of becoming poor. There are Annexes 1-3, which provide detailed description of how the poverty line was developed and key measurement assumptions made, and are intended for specialist readers.

1. BUILDING THE LSMS

This chapter provides essential facts about the BiH LSMS survey, focusing on three critical issues: why the sampling used for the survey is representative of the population of each Entity and the country as a whole; what information was collected; and how this information was used and adjusted to classify respondents by their socio-economic status. Among the variables created on the basis of the information collected, this chapter covers only “categorical” variables, leaving the description of welfare measurement to the next two chapters.

A. Historical Background

1.1 In 1992, Bosnia-Herzegovina, one of the six republics in former Yugoslavia, became an independent nation. A civil war started soon thereafter, lasting until 1995 and causing immeasurable suffering, widespread destruction, and substantial loss of life. Following the Dayton Accords, Bosnia-Herzegovina (BiH) emerged as an independent state comprising two Entities, namely, the Federation of Bosnia-Herzegovina (FBiH) and the Republika Srpska (RS), and the district of Brcko.

1.2 In the post-war process of rebuilding the economic and social base of the country, the government has faced problems created by a shortage of relevant data on the welfare of citizens. The three statistical organizations in the country (the State Agency for Statistics for BiH, BHAS; the RS Institute of Statistics, RSIS, and the FBiH Institute of Statistics, FIS)¹ have been active in working to improve the data available to policy makers at both the macro and the household level. One aspect of their activities is to design and implement a series of household surveys. The first of these surveys is the Living Standards Measurement Study survey (LSMS). Later surveys will include a Household Budget Survey (HBS: an income and expenditure survey) and a Labor Force Survey (LFS). A subset of LSMS households will be re-interviewed in the two years following the LSMS to create a panel data set.

1.3 The three statistical organizations began work on the design of the LSMS in 1999. It was determined from the start that the survey should provide data at both the country and the Entity level, and allow valid comparisons between both Entities. It was also decided that the project would include not only the *collection* of data, but also their *analysis* and public *dissemination*. The present volume is one of the outputs of these activities.

¹ In principle, BHAS, is the country level statistical office responsible for collating information from the two Entity-level statistical institutes (FIS and RSIS) and for setting country-wide standards in the field of statistics. The two Entity-level statistical offices are responsible for data collection and collation within their respective Entities. At the time of the survey, the political status of Brcko was still under discussion; it did not yet have a separate statistical office as it now does.

1.4 The survey, the analytical work and the dissemination of the data were carried out by the three statistical organizations with financial and technical support from the UK Department for International Development (DfID), the United Nations Development Program (UNDP), the Japanese Government, and the World Bank.²

1.5 Overall management of the project was undertaken by a Steering Board comprising the Directors of the RS and FBiH Statistical Institutes, the Management Board of the State Agency for Statistics, and representatives from DfID, UNDP and the World Bank. Day-to-day project activities were carried out by a Survey Management Team, made up of two professionals from each of the three BiH statistical organizations.

B. Survey Instrument

1.6 The BiH LSMS is a multi-topic household survey covering a wide range of factors that affect welfare: housing, education, health, labor, migration, credit, privatization vouchers, social assistance, consumption, agricultural and non-agricultural activities. The household questionnaire and the individual questions included in it were designed to address the specific situation of the country and the data needs of policy-makers. In addition, several sections of the questionnaire were based on draft questionnaires for future surveys (the HBS and the LFS) and/or older surveys to allow some tracking of indicators over time. The process of designing the questionnaire was lengthy and involved an inter-agency team from the three BiH statistical organizations. In addition, several ministries provided detailed comments and suggestions. Table 1.1 provides a summary description of the modules included in the questionnaire.

Table 1.1 Contents of BiH-LSMS Household Questionnaire

Module	Description
1. Roster	This module listed all the members of the household and their characteristics such as relationship to head of household, age, sex, marital status, and members absent from the household.
2. Housing	This module included the following sections: A. Description of primary residence: type of dwelling, condition of dwelling, number of rooms, plinth area, and presence of utilities (electricity, water, sewerage, telephone, etc.); B1: Ownership status and expenditures on electricity, water and sewerage; B2: Ownership and purpose of secondary residence; C: Possession of durable goods, their date of purchase and present value.
3. Education	A. Child care and kindergarten attendance and monthly expenditure for child care (for children between 0 and 7 years of age); B. General education (for persons 7 years old and over and for children less than 7 years who attended school), literacy status, educational qualifications, informal payments and source of financial assistance during the academic year 2000-2001, distance of the school from home etc.
4. Health	A: Utilization of health care services: use of various types of health services—primary health care centers (ambulanta or DZ), laboratory tests, pediatrician, gynecologist, dentist, other doctors, paramedics, alternative medical care, self medication—and expenditure on these services. This section also included questions on the prevalence of chronic ailments and the utilization of health insurance. B. Review of respondents' own health condition elicited information on perceptions about various health conditions on a three or four point scale, focusing particularly on mental health status.
5. Labor	This module elicited information for persons 15 years old and over on their activity status during the reference week preceding the survey. For employed persons, information was sought on occupation, industry, employment status, place of work, previous employment, number of hours worked in the

² The creation of a master sample for the survey was supported by the Swedish Government through SIDA, the European Commission, UK DfID, and the World Bank.

	week and monthly earnings. For unemployed persons, information was sought on duration of unemployment, last occupation, employment status and industry, method of seeking work, and whether registered at an employment bureau.
6. Credit	This module asked all persons 15 years and over the number of times the person had borrowed from different sources, amount borrowed during the last 12 months, amount owed presently, the month and year of the last borrowing, and reasons for borrowing and refusals of loans.
7. Vouchers:	This module included questions on eligibility for privatization vouchers/certificates, value of vouchers/certificates received, transactions made with them, sale value of vouchers/certificates sold, and the nominal value of the vouchers or certificates in their possession.
8. Migration	For persons 15 years and over, apart from current residence, information was sought on (i) municipality of birth, (ii) residence prior to April 1992, (iii) reason for migration and (iv) current residential status.
9. Social Assistance	This module included questions on eligibility for old age pension, disability pension, survivor's pension, war veteran's pension, monthly pension received, and the allowances and services received during the preceding 12 months.
10. End of First Visit	This module was intended to identify households to be covered by Module 12 and Module 13.
11. H/H Consumption	Each of the following sections elicited information on the quantity and value of purchased items and own production, and the value of items received as gifts: A. Daily expenses during the preceding 7 days included questions on frequently consumed items such as tobacco, cigarettes and meals taken in restaurants; B1 Food consumption: average monthly expenditures on items of daily consumption such as bread and cereals, meat, fish, etc; B2. Seasonal food consumption – fruits, vegetables; C1. Monthly expenditures on non-food products such as transport, cosmetics, fuel , cleaning products, etc; C2. Annual expenditures on other non-food products, including clothing and footwear, furniture, etc;
12. Non-Agro Business	This module elicited the following information from households engaged in non-agricultural activity: A. Information on establishments: nature of activity, persons engaged and number of activities; B. General information on the duration of enterprise operation, location, ownership, number of days a week operated, number of persons engaged. C. Labor: number of persons engaged, number of household members and number of non-household members, number receiving wages in cash or in kind. D. Revenues and inputs: number of months the business operated, gross earnings in an average month, expenses on inputs in an average month E. Capital asset: value of fixed capital such as land, buildings, equipment and machines etc., and main problems faced by the establishment.
13. Agricultural Activities	This module collected the following information on farming operations with special focus on farm management, inputs and earnings: A1: land used: area of different categories of land, extent used and not used, irrigated land, present value, nature of use/lease, lease value during 2000-01, etc; A2. Land owned by household but not used: category of land, how obtained, present value, type of use contract, lease amount received during 2000-01, etc; B1. Use of forest land: age of forest, value of produce sold, value of produce used by household; B2. Crop production and use: area of land used, amount of crop harvested, amounts sold, lost, used as wages, used as animal feed, processed, consumed by the household and given away as a gift; C1. Inputs and investments: total quantity of seeds or seedlings used by the household, quantity bought and its cost, quantity used from own production, whether obtained as gift and from whom. C2. Inputs and investments: fertilizers - total quantity used, purchased, obtained as gift; C3 Inputs and investments: fuel and energy - total quantity of fuel used, bought and its value, whether obtained in any other way and from whom; C4. Inputs and investments: labor - number of paid workers, number of paid work days, average daily wage, whether payment was made in kind etc; C5: Inputs and investments: machinery - source of hire, number of hours machinery was hired, amount paid per hour and whether payments were made in kind; D1 Livestock: number of various categories of livestock, value, livestock sold during the past 12 months, consumed, lost, gifted and bought, new born, number received as gift, whether any livestock product was sold and their value; D2. Animal feed: quantity of animal feed used during past 12 months, purchased and its value, own produced, whether received as gift and the source of gift; E. Farm capital assets: type of capital assets, their market value, age of the asset, whether the asset is rented out, earnings during 2000-01 from renting out the capital assets.

C. Sample Design and Weighting

1.7 Selecting a probability sample that would be representative of the country's population presented problems. The sample design for any survey depends upon the availability of information on the universe of households and individuals in the country. Usually this comes from a Census or administrative records. In the case of BiH the most recent Census was done in 1991. The data from this Census were rendered obsolete, not only by the simple passage of time but also because of the massive population displacements that occurred during the war.

1.8 At the initial stages of the project it was decided that a master sample should be constructed. Experts from Statistics Sweden developed the plan for the master sample and provided the procedures for its construction. The households for the LSMS were selected from this master sample.

1.9 The master sample was based on a selection of municipalities and a full enumeration of the selected municipalities. Optimally, one would prefer smaller units (geographic or administrative) than municipalities. In the case of BiH, however, it was determined that population estimates were reasonably accurate for municipalities, but not for smaller geographic or administrative areas.

1.10 The first step in creating the master sample was to group the 146 municipalities in the country into three strata--urban, rural and mixed--within each of the two Entities. Brcko was excluded from the sampling frame.

1.11 Municipalities were selected with a probability proportional to estimated population size (PPES) within each stratum, so as to select approximately 50% of the mostly urban municipalities, 20% of the mixed and 10% of the mostly rural ones. Overall, 25 of the 146 municipalities were selected, 14 in FbiH and 11 in RS. The distribution of selected municipalities over the sampling strata is shown in Table 1.2.

Table 1.2 Selection of Municipalities

Stratum <i>i</i>	Total municipalities	Sampled municipalities
1. Federation, mostly urban	10	5
2. Federation, mostly mixed	26	4
3. Federation, mostly rural	48	5
4. RS, mostly urban	4	2
5. RS, mostly mixed	29	5
6. RS, mostly rural	29	4

Source: BHAS, RSIS, and FIS (2003)

1.12 In each of the selected municipalities a full listing of households ("microcensus") was carried out. The work was carried out on a decentralized basis, whereby the FIS and the RSIS were responsible for carrying out the fieldwork under the general guidance of the BHAS. The municipalities cooperated by providing temporary office and storage space, along with recruitment of enumerators and controllers for the survey. The fieldwork was supervised by the staff of the two Entity institutes; all these groups were trained by their respective institutes.

1.13 The municipalities were divided into geographic enumeration areas (EAs). In theory, each EA consisted of the number of households that could be interviewed by a census enumerator in one day, based on the 1991 Census. At the time the master sample listing operation was carried out, however, many of EAs actually contained many fewer households (in some cases, zero). As EAs were to be the primary sampling unit for the LSMS survey, the first step was to combine contiguous EAs until a new enumeration area with a minimum of 50 households was formed. These newly constructed EAs were called groups of enumeration areas (GNDs) and replaced the original small EAs.

1.14 Based on the population figures from the master sample microcensus, 250 EAs were selected with probability proportionate to size (PPS) from FbiH municipalities, and 200 EAs with PPS from RS municipalities. Within each of the 450 selected EAs, 12 households were randomly selected, giving a total sample of 5,400 households made up of 2,400 in RS and 3,000 in FbiH.(see Table 1.3).

Table 1.3 Sample Distribution by Municipalities

Municipality	Sample households	Statistical weight for each household	Sample proportion	Weighted sample households	Weighted sample proportion
1 Banja Luka	936	64.6	0.173	60485	0.055
2 Srpska Ilidza	84	542.5	0.016	45570	0.041
3 Cajnice	36	1586.5	0.007	57116	0.051
4 Mordica	132	285.4	0.024	37674	0.034
5 Novi Grad	156	263.3	0.029	41071	0.037
6 Prijedor	432	83.2	0.080	35964	0.032
7 Visegrad	84	422.7	0.016	35509	0.032
8 Knezevo	60	698.8	0.011	41930	0.038
9 Samac	108	369.2	0.020	39874	0.036
10 Srbac	120	345.2	0.022	41425	0.037
11 Zvornik	252	170.3	0.047	42922	0.039
12 Centar	276	160.7	0.051	44345	0.040
13 Nov Sarajevo	288	152.8	0.053	44013	0.040
14 Novi Grad	432	96.4	0.080	41642	0.038
15 Tuzla	528	78.7	0.098	41540	0.037
16 Zenica	468	83.2	0.087	38931	0.035
17 Breza	60	704.6	0.011	42275	0.038
18 Travnik	192	191.1	0.036	36702	0.033
19 Visoko	144	242.9	0.027	34980	0.032
20 Vogosca	84	511.6	0.016	42976	0.039
21 Gradacac	144	337.3	0.027	48572	0.044
22 Grude	48	1163.0	0.009	55826	0.050
23 Kakanj	144	359.6	0.027	51781	0.047
24 Posusje	48	974.2	0.009	46762	0.042
25 Zavidavici	144	413.3	0.027	59516	0.054

Source: BHAS, RSIS, and FIS (2003)

1.15 An important point about the LSMS sample design is the fact that in each municipality each household had a different *a priori* probability of being selected in the survey. Therefore, to project survey results onto the population, one needs to multiply the results from each household

in a municipality by its “weight” (given in Table 1.3). The sum of weights gives an estimated population of the two Entities. All results in the Poverty Assessment are weighted with these factors.

D. Field Work

1.16 A draft questionnaire was pilot tested during the period June 25-July 20, 2001 in the two Entities. After the test, the health and labor modules were cut back substantially. The credit module was also cut back, given concerns about questionnaire complexity. The non-agricultural enterprise module was also reduced substantially.

1.17 Fieldwork started on 26 September, 2001 and ended on 23 November 2001. Its timing was limited by the need to finalize all interviews before the start of Ramadan since household consumption patterns were expected to change during the fasting month. On average, interviewers took 1.5 hours per household to collect the data. Only in the case of households with over 5 members did the interview take longer. The interviewing was conducted at the convenience of respondents, which meant that interviews were conducted both during the day and during the evenings, and throughout the week, including weekends.

1.18 Each interviewer was assigned two clusters of households. (Each cluster consisted of 12 households in an enumeration area or group of enumeration areas). Interviewers often visited each household more than twice. All information was collected from direct informants, except in the case of children under 15 whose parents were asked to provide the information. Otherwise, the interviewer carried out a series of interviews in the household, one for each member.

1.19 Each Entity provided interviewers and supervisors with badges and letters of introduction. Communication with field staff was improved by recruiting interviewers and drivers who had cell-phones.

1.20 Overall, the response rate in the survey was 82 percent. For each enumeration area, four replacement households were selected prior to the field work. Using these replacement households as needed (a total of 938 households), the final sample size was 5,402 households interviewed.

E. Data Entry, Cleaning and Variables Definition

(i) Data Entry

1.21 An integrated approach to data entry and fieldwork was adopted. Data entry proceeded side by side with data gathering to ensure verification and correction in the field. Data entry stations were located in the regional offices of the Entity institutes and were equipped with computers, modems and dedicated telephone lines. Completed questionnaires were delivered to these stations each day for data entry.

1.22 Data were entered soon after questionnaires were completed, and a customized data entry program was used to identify errors (missing data, inconsistencies and the like) in the data. This enabled interviewers and supervisors to check each questionnaire, resolve any small difficulties and/or decide that the interviewer needed to return to the household for clarification. The data

entry program was designed to detect many errors at the entry stage, thereby minimizing the need for ex-post facto data editing. Once all data were compiled in the Entity offices, a check was made to ensure the structural consistency of data files, i.e. that no records were duplicated or omitted.

1.23 Every efforts was made to make data sets from each Entity compatible so that a country-wide data set could be created.

(ii) Data Cleaning

1.24 It is important to note what is meant by ‘data cleaning’ in terms of the BiH-LSMS data set. In the sense that it is a faithful reflection of the responses of all interviewees, the data set can be considered ‘cleaned’. But as participation in the survey was voluntary, informants had the option to refuse to answer specific questions, and may have provided information that was not always consistent.

1.25 Some data sets are processed so that all missing values are imputed, all outliers revalued and all inconsistencies fixed based on a given set of assumptions. This was not done in the case of the BiH LSMS dataset available for public use. The survey team decided that there was no single “correct” way to resolve problems of missing data, outliers and inconsistencies. Each user would need to make his or her own decision on how to treat such problems based on the type of analysis being carried out. For some analyses, information on outlier values is key; for others, outliers would distort findings and would need to be dropped or given an imputed value. The same point applies to missing values. Some analysts will chose to drop cases with missing values for the variables of interest to them, while others will impute such values, using medians, mean or complex multi-variate techniques. In order to ensure the usefulness of the BiH data set for all users, the LSMS data as disseminated did not impute missing values, reconcile inconsistencies, re-value outliers, or in any way alter the responses provided by the respondents.

1.26 In most cases, respondents’ direct answers were enough to consistently classify them into groups. For example, respondents’ answers determined their grouping by education level (those with primary education, with secondary completed, etc.). But in some cases, classification required a combination of responses to various parts of the questionnaire, or some adjustments, notably with respect to labor market status and receipt of pensions. Note that no adjustments were made in LSMS raw data, and adjustments discussed below were only made for the Poverty Assessment.

(iii) Definitions: Urban, Rural and Mixed Localities

1.27 The urban-rural definitions used in BiH (discussed above in section C) are unusual, with large administrative units such as municipalities classified as if they were completely homogeneous. Their classification into urban, rural, or mixed comes from the 1991 Census, which used the predominant source of income of households in the municipality to categorize it. Urban municipalities are those where incomes of 65 percent or more of the households are considered to be “urban,” and rural municipalities are those where the proportion of households with “urban”

incomes is below 35 percent. The remaining municipalities were classified as mixed (urban and rural).

1.28 This definition is imperfect in several ways. First, the distribution of income sources may have changed dramatically after the war: populations have shifted, large industries have closed and much agricultural land remains mined. Second, the definition is not comparable to those used in other countries, where villages, towns and cities are classified as rural or urban by population size or by types of services and infrastructure available. Third, municipalities can be made up of communities with substantially different characteristics. Nevertheless, it was not felt that these imperfections were substantially detrimental to the sample design. The urban/rural definition can be useful for analytical purposes, and a check shows that in fact it is broadly consistent with the type of economic environment that all households in a locality face.³

(iv) Definitions: Labor Market Status

1.29 The state of the labor market is one of the key policy issues in BiH. This report uses the LSMS survey to construct and analyze unemployment and employment figures. The simplest and the most direct way is to use respondent self-identification, such as “employed”, “unemployed”, or “retired”. This approach, however, suffers from deficiencies. Actual employment status is often very complex, and respondents have difficulties in unambiguously identifying themselves into a single category (for example, working pensioners). Unemployment presents special problems. Registered unemployment in BiH is huge: for every 100 registered employees there are 40 people registered as unemployed. This number was broadly confirmed by LSMS respondents. But in economic terms, unemployment is not only defined by registration; it denotes a person who in a particular moment in time does not have a job, is actively searching for a job, and is ready to start working. Registration is not an accurate labor market status definition, as people may want to register to get certain benefits (such as health insurance). Others may be working “in the gray sector” (without registration). Such arrangements are attractive to employers, who “economize” on payroll contributions to various social funds. This “economy” will allow them to offer higher wages than for comparable work in the formal economy. Thus economic definitions which rely on actual reported activities are preferable.

1.30 The next few paragraphs summarize the approach used to construct key labor market status variables. The “universe” consists of all persons older than 15 years old (that is, they were past their 15th birthday as of 1st November 2001, i.e. at the time of the administration of the survey). The working age population is all persons of “legal” working age (i.e. above 15 and below the normal retirement age, 55 for women and 60 years for men); if a person during the week preceding the interview is employed by someone, works for her/his own benefit, or has a job to return to, then he or she will be counted as employed (even if this person is outside the legal working age). A person is classified as *unemployed* if he/she is in the working age population, but not employed as defined above, has actively sought work in the last 4 weeks, and is available for

³ For example, the percentage of LSMS households in each stratum reporting using agricultural land or having livestock is highest in the “rural” municipalities and lowest in the “urban” municipalities. However, the concentration of agricultural households is higher in RS, so municipality types are not comparable across entities. The percentage reporting no land or livestock in RS was 74.7% in “urban” municipalities, 43.4% in “mixed” municipalities and 31.2% in “rural” municipalities. Respective figures for FBiH were 88.7%, 60.4% and 40.0%.

work (able to start to work in the next 2 weeks). True (ILO) unemployed defined in this way are different from *discouraged workers*, who are non-employed persons of working age who were *not* looking for job in the last 4 weeks, but wanted to work, were available for work, but believed that no suitable job was available.

1.31 All other persons in the universe, who are not **employed** nor **unemployed**, are considered *out of the labor force*, or inactive.

1.32 The application of such a classification in the BiH LSMS reveals that the registered unemployed include many different sub-categories. Not all registered unemployed are ready to take a job when one becomes available. Many people are registered as unemployed not in order to find a job but for other reasons (such as obtaining benefits). People may be without a job and not looking because they are “discouraged” as discussed above; or they may not be ready for a job for personal reasons, or may be simply unwilling to work (i.e. be inactive). All of these diverse categories may end up as registered unemployed. Specifically, according to the LSMS:

- Out of 498,000 registered unemployed in Bosnia and Herzegovina in 2001, only 122,000 (24.4 percent) qualified as unemployed according to the standard definition of unemployment;
- Among the remainder, 124,000 (25.0 percent of the registered unemployed) were actually employed workers, and 252,000 were inactive (50.6 percent of the total);
- Not all of those who were actually unemployed had registered 69,000 (36.3 percent of the unemployed on the LSMS definition) did not approach employment offices and register;
- Among the inactive persons who were registered, slightly more than half qualify as discouraged in the sense described above.

1.33 Another important distinction is the definition of “*formal*” versus “*informal*” sector. According to the “Resolution Concerning Statistics of Employment in the Informal Sector” (The Fifteenth International Conference of Labor Statisticians, ILO[1993]), the defining element of informal employment is the fact the employer is not an incorporated business. That is, a worker is treated as informally employed if he (she) is either self-employed (in an unincorporated business), or an employee working for an unincorporated employer. Note that by their nature, informal jobs are associated with different degrees of risk and stability. The self-employed, by definition, take responsibility for both job risks and profits, and their status is directly affected by their business performance; employees in the informal sector are usually more exposed to risk, because they enjoy less protection from joblessness. At the same time, however, formal sector workers may or may not be covered by health and pension insurance.

1.34 To determine formal vs. informal work status in the BiH LSMS, the convention was adjusted. For some workers, it was possible to infer from the questionnaire whether or not their employers were incorporated businesses; those categorized as working in **informal** employment were all unpaid supporting family members, farmers working on their own farms, and those engaged in similar activities (described as the sale of agricultural and other products, etc). In contrast, **formally employed** are all workers who worked in incorporated businesses, public enterprises and international organizations. However, for many workers, it was impossible to infer from the questionnaire whether or not their employers are incorporated businesses. These workers

were categorized into the formal sector if their pension contributions were paid, and into the informal sector if they were not.

(v) Definitions: Social Assistance and Receipt of Pension

1.35 The LSMS questionnaire asked respondents whether they received a pension, type of pension (civil, military, or veterans'), and the amount received. Preliminary analysis of the results demonstrated that the survey did not match the official figures. The information was reorganized according to the information on age and level of benefit that appeared consistent with the published information. The final results were closer to the official figures.

1.36 Particular problems requiring adjustment included the following:

- Some persons said that they were receiving 2 or more pensions, which is legally impossible;
- Many respondents said that they were receiving less than the minimum disability and survivor benefits

1.37 The results by category of pensioners and pension were reorganized to achieve consistency. In this reorganization, all values reported in the legal range were unchanged. The rest were changed, starting with the old-age pension (retaining only its value when it was declared and reclassifying others to nil), then followed by disability pensions, and finally by survivor pensions. The reported veterans' benefits were divided in two groups: invalids and family according to the reported percentage of disability. All disability pensions excluded from the category of "pensions" because of reported wrong amounts were moved into the category of veterans' invalid benefits unless the recipient was under age 18 (veterans benefits do not have strict minima). After such adjustments total number of beneficiaries (receiving civil and military pensions and veterans' benefits) estimated on the basis of the survey is close (within 10 percent margin of error) to the total reported officially.

1.38 LSMS data also show that the average benefit received is about 6% higher than the official average pension, so estimated overall expenditures on pensions is very close to the published figures.

1.39 The survey also reports the overall amount received by individuals for social assistance in the year, and the corresponding type of allowances (one or several). There are three types of allowance--permanent, temporary and assistance for the care of a dependant person. The survey indicates an individual's entitlements for each type, and reports the total amount of cash benefit received in the last year. Survey results are in line with what we know about overall social transfers, but not the distribution by type of benefits.

1.40 There was a concern that the questions was not precise enough to ensure that only government social assistance would be reported, and that individuals might report non-state types of assistance. These other types of assistance are assuming diminishing importance, however: the Public Expenditures and Institutional Review (PEIR) reports that if "there are also many donors and non-governmental organizations (NGOs) active in the social welfare sector.... many of the

larger programs have now been terminated or have been significantly scaled back [leading to] ... greater dependence on SWCP spending on local budgetary sources, especially since 1999.” (The World Bank [2002]).

1.41 The survey finds many fewer beneficiaries of permanent social assistance than the PEIR indicated. Nothing could be done with this problem, however. In the survey only about 30, 000 persons (23 % of the survey beneficiaries of social services and cash benefits) declare they receive social services (but no cash benefits). The survey seems to miss the people that are beneficiaries of social services other than cash.

(vi) Definitions: IDPs and Refugees

1.42 The LSMS asked about respondents’ (i) current residence, (ii) municipality of birth, (iii) residence prior to the war (April 1992), (iv) reason for migration and (v) current residential status. To define displacement status, reported answers to questions (iv) and (v) were used. The only problem in using the data collected in the LSMS was that the answers were collected only from individuals above the age of 15. To overcome this problem, a simple imputation procedure was used based on the household roster, assuming that children had the same status as their parents.

2. MEASURING WELFARE

This chapter discusses the rationale behind constructing a core welfare variable based on consumption per equivalent adult, reviews the requirements that a poverty line needs to meet to provide an accurate picture of poverty, and provides details on the poverty and inequality indices used in the study.

A. The Concept of Welfare

2.1 To examine poverty and inequality, we need a measure of material well-being. Ideally, this measure should correspond as closely as possible to the way a person experiences his or her standard of living. It is natural to think that a person's standard of living, or material well-being, as a function of all goods and services consumed by that person.

2.2 But how can one compare different individuals consuming different quantities of various goods? Economic theory allows us to rank levels of well-being using the *cost (monetary value) of the consumption bundle consumed in a given period*. The intuition is simple: the individual could have bought a cheaper bundle of goods, but he or she did not. Hence, he or she must get a higher level of well-being from the current bundle of goods than from any cheaper bundle of goods. The cost of the consumption bundle is therefore a "money-metric utility"; it represents well-being expressed in Convertible Marks (KM) in the case of BiH,⁴ Euros or any other currency.

B. Consumption or Income Aggregates for Measuring Welfare

2.3 In theory, any welfare measure should include all of the factors (including health, leisure, social capital and other desiderata) that contribute to welfare. In practice, however, due to measurement and valuation difficulties, the focus in micro-data analysis is only on material well-being using information on consumption of goods and services by a household. Even such 'simple' measures are, in practice, quite complicated to capture well, and there is debate as to whether income or consumption is the preferable measure.

2.4 Income is often considered to be the preferred measure, because it is an indicator of the "potential" to enhance welfare (including non-material aspects such as leisure). But income suffers from several defects both in theory and in practice. First, income can be highly volatile,

⁴ The BiH currency, the Convertible Mark (KM), was, at the time of the survey, pegged to the German Deutsch Mark. This value at the time of the survey (Nov. 2001) was approximately US\$ 1.9.

whereas consumption can be, and is, more readily smoothed by individuals. This smoothing makes consumption a better indicator of welfare than income, because it more accurately represents the welfare level of an individual at any given time. In transition economies such as BiH, people are paid very irregularly, with several months of wage arrears being common. In this context, relatively steady consumption-based welfare measures give a more accurate picture than often erratic income-based measures.

2.5 Second, regardless of the measure, it is essential that it be comprehensive, that no aspect of income or consumption be omitted.⁵ Otherwise, erroneous conclusions may be drawn about the numbers and characteristics of the poor. If, for example, the value of home-produced food were omitted from an income aggregate (total income measure), then rural populations would look much poorer than they actually are. Or if a consumption aggregate is constructed using only monetary expenditures, those who receive in-kind benefits from employment would look poorer than they actually are.

2.6 Again, measurement problems are more severe in transition countries with respect to income than with respect to consumption. Income under-reporting is marked for many reasons including sometimes because survey respondents are not willing to fully disclose illegal or semi-legal income sources. Experience in BiH showed that households were not willing to provide information on unregistered businesses and informal sector activities. Finally, produce from household plots has become a mainstay of food consumption, but is not a standard component of money income.

2.7 Relatedly, practical experience suggests that the quality of consumption-based data obtained from households is better than the quality of income-based data. At the top end of the income distribution, households tend to under-report their income, reflecting a lack of faith in the confidentiality of the survey, concerns about the tax authority, complexity of earnings that would lengthen an interview, and the like. At the other end of the income distribution the problem is less one of willingness to provide accurate data and more one of inability to do so. Households engaged in informal activities and/or with household businesses often cannot separate out what is 'household' income and what is 'business income' thus undermining the reliability of the data collected.

2.8 In summary, given the difficulties of defining a total welfare measure, a money-metric measure such as consumption or income is typically used. And given the problems noted above with respect to income-based measurement, the remainder of this discussion of measuring welfare here will focus on consumption.

⁵ Total income includes: all labor income, all income from home production, all income from self-employment, household enterprises, public and private transfers, rents, the use value of durable goods and housing. Total consumption requires data on food consumption (from purchased, home-produced and gift goods), together with non-food consumption, and the use value of durable goods and services.

C. Content of Consumption Aggregate and Adjustments

2.9 Consumption needs to be properly measured and adjusted to constitute an appropriate welfare index. This section discusses measurement and adjustment issues.

(i) Conceptual Issues

2.10 There are conceptual issues to be kept in mind when constructing a money-metric welfare measure based on consumption. Essentially, these relate to the distinction between expenditure and consumption. First, only consumption during the survey reference period is measured. Unlike food, consumer durables and housing are consumed over a long period of time. Hence, it would be inaccurate to attribute expenditure on such goods wholly to the reference period. Therefore such expenditures are excluded, and the imputed value of the *consumption flow* associated with the possession of a consumer durable is included instead.

2.11 Second, expenditures that reflect differences in need or tastes are excluded. When consumption is used as a measure of well-being, higher consumption should indicate a higher level of well-being. For most consumption items this correspondence is reasonable. However, for some categories, such as health expenditures, this correspondence is questionable.

2.12 Third, since the main purpose of measuring welfare is to compare households to each other, two key adjustments must be made in order to obtain proper rankings of households and individuals. These are adjustments for spatial price differences and for household composition.⁶

(ii) Spatial Price Adjustments

2.13 Consumption (or income) is only a valid measure of well-being if people who spend more actually consume more, or higher-quality, goods, and not if they merely spend more for the same goods owing to higher prices. Hence, we need to adjust for possible differences in prices across different geographical areas. A small example illustrates the point. A kilogram of carrots might cost 1.5 Euros in a capital city and only 1.1 Euros in a small village. But the benefit of consuming a kilogram of carrots is the same regardless of where they were bought or at what price. Thus, to compare the welfare levels of two households or individuals, we need to adjust the prices paid so that the welfare obtained is the same in monetary terms.

2.14 Large differences typically exist in the cost of living between urban and rural areas and often within each area. In principle one could use regional components of the national Consumer Price Index (CPI) to adjust for spatial differences. In most countries, however, the CPI is not calculated at the regional level. For this reason, it is worthwhile to use the household survey data themselves to construct CPIs at the relevant geographic levels (See Chapter III, Section C. ii).

⁶ Note that, in the case where data are collected over a long period of time, it would also be necessary to adjust for changes in prices over time.

(iii) Per Capita or Per Adult Equivalent

2.15 Consumption data from household surveys are collected at the level of the household rather than the individual. But, in order to determine the welfare levels of people, total household consumption must be divided among household members. Consumption cannot, however, be explicitly assigned to individual household members using the data. Instead, an adjustment based on some allocation rule must be imposed to attribute their share of households resources to individuals within the household. One such allocation rule is simply to divide total household consumption by the number of household members. This gives us per capita consumption.

2.16 This is the most commonly applied method and it implies that all family members receive an equal share of household resources. Alternative allocation rules, known as equivalence scales, are often proposed. Although there exists little guidance for choosing among the wide range of possible scales, it is important to examine the sensitivity of poverty comparisons to the particular allocation rule chosen. This issue is particularly important when one is concerned with the demographic characteristics of the poor.

2.17 Two alternative allocation rules are adult equivalents and economies of scale. They reflect the fact that one would, ideally, like to take into account the fact that children and adults do not consume at the same levels and, also, the fact that economies of scale exist in households. To do this one can use the following equation to adjust the actual number of household members to a number of 'equivalent adults'.

$$EA = (A + \alpha K)^\theta$$

Where:

EA= number of equivalent adults

A= number of adults

K= number of children

α = parameter for economies of scale

θ = parameter for shared goods consumed

2.18 Adults vs. Children: Typically children consume less than adults in a household. They have lower caloric needs, their clothes are often significantly cheaper and they consume a more limited list of items. The parameter *alpha* in the equation reflects the lower cost of children and can take on a value from 0 to 1. Assigning this parameter a value of 1 essentially assumes that children consume the same as adults and is equivalent to the per capita measure.

2.19 Economies of scale: The parameter *theta* adjusts for shared and private goods in the household and can take on a value from 0 to 1. If all goods were private goods (such as food which only one person can consume) the parameter would be equal to 1 and again, would be equivalent to a per capita measure.

D. Poverty Lines

2.20 Once a consumption aggregate is constructed and adjusted for prices and household composition, it is possible to rank all individuals by their welfare levels. Often, however, it is important to be able to classify individuals into categories of poor and non-poor. For this purpose poverty lines, either relative or absolute are calculated. Individuals' consumption is then compared to these lines: if consumption is below the line, the individual is categorized as poor.

2.21 A poverty line is set to a value of consumption (or income) below which one would be considered to be poor by the society in which one lives. A poverty line can be set in a variety of ways, depending on the purpose and needs. Below we first distinguish between relative and absolute poverty lines, and then consider two specific types of absolute poverty lines.

(i) Relative Poverty Lines

2.22 The value of a relative poverty line is based on how one group in the society compares to the rest. The common practice in European countries (where relative lines are most frequently used) is to set the poverty line at a fraction of median income. Thus this line incorporates the overall wealth of the country and its average standard of living. A person who is considered to have consumption below this line is considered to be poor relative to other people in the country. Clearly, in very wealthy countries, the 'poor' could have a standard of living that would be considered more than adequate in other countries or at an earlier period.

(ii) Absolute Poverty Lines

2.23 An absolute poverty line, as its name implies, does not measure poverty relative to others' welfare levels but instead attempts to establish the value of consumption that any person needs, regardless of time and place.

2.24 Extreme or Food Poverty Line: The most commonly used absolute poverty line is based on food consumption. Its use reflects the fact that every person needs a certain number of calories per day to maintain life and the energy required to work and participate in his or her society. Nutritionists set minimum caloric requirements by taking into account the age, gender and level of effort expended by individuals. Using this accepted minimum caloric requirement, the cost of the absolute food poverty line is set at the money value required to obtain this minimum level of calories.

2.25 It is important to note that even an absolute food poverty line has an element of 'relative poverty' in it. In theory, the lowest cost of obtaining the minimum level of calories would be the accurate value of the food poverty line. This lowest cost can be obtained through the solution of an optimization problem. But while the solution might be accurate, it would in all likelihood consist of a diet that would be completely unacceptable for people in the country in question on cultural grounds. To avoid this difficulty, the costs of obtaining the minimum level of calories are instead based on actual patterns of consumption observed in the country. This does not imply that everyone must eat a similar diet, and in fact, no one does actually eat the 'average' diet. But it does mean that absolute poverty lines based on food consumption are quite specific to each country and would be inaccurate elsewhere.

2.26 **General Poverty Line:** A second absolute poverty line is based on the concept that food is not the only good required by an individual. For example, to survive winter, a person needs housing, and to work a person needs to be able to clothe himself or herself adequately. Unlike food consumption, however, where there are objective measures of what is needed (calories), there are no accepted standards for non-food consumption of goods and services. Ten people would devise ten different lists of ‘needs’: no criteria exist for determining which list is most appropriate. Any attempt to create a set basket of non-food needs is, essentially, a very subjective effort and would be closer to a relative poverty line concept than an absolute one.

2.27 Instead, one can use the data and the patterns of consumption of the population to calculate an allowance for essential non-food spending that is added to the value of the extreme food level. How this is done differs:

“... In the poverty line developed by Orshansky for the United States, the basic food poverty line was scaled up by a factor of three, based on the empirical observation that in the United States approximately 75 percent of the average household’s budget was spent on non-food items (Orshansky, 1963, 1965). As pointed out by Deaton (1997) the choice of scalar was quite arbitrary and is not terribly intuitive.

Ravaillon (1994a, 1998) proposes two alternatives, both of which differ from the Orshansky approach in that the determination of required non-food expenditures is based on the expenditure patterns of the poorer members of the population. The first, “austere” approach entails finding the amount normally spent on non-food items by those households whose total expenditure [...] is just equal to the food poverty line, and adding this amount to the food poverty line. The idea is that because these households are sacrificing essential food consumption in order to acquire a certain number of non-food items, they must view these items as essential. The second, “upper-bound” approach is to scale up the food poverty line by the amount spent on non-food by households whose actual food expenditures equal the food poverty line [...]” (Lanjouw and Lanjouw, 2001).

E. Poverty and Inequality Measures

2.28 The simplest and most common measure of poverty is the headcount index which simply indicates the percentage of the population in households whose per capita consumption is below the poverty line. This measure, however, says nothing about the how far below the poverty line, or how poor, these individuals are. As this is important, several other measures are used: the depth and the severity of poverty.

(i) Poverty Index

2.29 Measures of dimensions of poverty are based on the Foster, Greer, and Thorbecke (1984) class of poverty measures. This class is described by:

$$P(\alpha) = \frac{1}{n} \sum_{i=1}^n \left[\max \left(\frac{z - c_i}{z}, 0 \right) \right]^\alpha$$

where α is the parameter (explained below), z is the poverty line, c_i is equivalent consumption of individual i , and n is the total number of individuals. If we set α equal to 0, we obtain $P(0)$, or the poverty headcount index. $P(0)$ simply measures the fraction of individuals below the poverty line. If we set α equal to 1, we obtain $P(1)$, or the poverty gap. This characterizes how many resources are needed to bring the consumption of all of the poor to this poverty line. The poverty shortfall is a poverty measure that takes into account how far the poor, on average, are below the poverty line. One can show that

$$P(1) = P(0) \times (\text{Average Shortfall})$$

where the average shortfall is the amount, measured as a percentage of the poverty line, by which the mean consumption of the poor on average falls short of the poverty line. Finally, if we set α equal to 2, we obtain $P(2)$, sometimes also called the severity of poverty or FGT(2). This poverty measure captures difference in the severity of poverty, since it effectively gives more weight to the consumption of the poorest.

(ii) Inequality Measures

2.30 Inequality matters because, unless a society is highly mobile, the economic distance between the rich and the poor presents an important indicator of differences in values, aspirations, consumption patterns and lifestyles across groups. Inequality has many correlates: social exclusion, declining investment in human capital in low income areas, declining confidence in the government, increased economic insecurity, and impaired functioning of democracy.

2.31 There are many statistical measures of inequality. Some are more sensitive to different parts of the income or consumption distribution than others and some are more easily interpreted than others. Perhaps the easiest to interpret is the 90/10 percentile (or decile) ratio. It shows how many times the poorest person in the top decile consumes more than the richest person in the bottom decile. The 90/10 ratio is the product of the 90/50 ratio (“rich to middle” ratio) and the 50/10 ratio (“middle to poor”). These ratios, while of interest, are only sensitive to parts of the distribution.

2.32 Other common measures of inequality take into account the entire distribution. For example, the population can be divided into equal-sized groups based on consumption per capita. If we choose to use 5 groups, then for each of these groups, or quintiles, we can show their shares in total consumption. Since in a perfectly egalitarian world all groups would consume 20% of the total, deviations from this even distribution can measure consumption inequality.

2.33 There are also special indices that summarize the whole distribution in one number—the Gini coefficient, the Theil entropy index, and the Theil mean log deviation and standard deviation of logs. The Gini coefficient is perhaps the best-known inequality statistic and is given by:

$$G = \frac{2}{\mu n^2} \sum_{i=1}^n \left(r_i - \frac{n+1}{2} \right) c_i$$

where there are n individuals indexed by i , their consumption is given by c_i , mean consumption is denoted by μ , and where r_i is household's i rank in the consumption ranking (i.e. for the household with lowest consumption r_i equals 1 while for the household with the highest consumption r_i equals n). The Gini coefficient ranges between 0 (perfect equality) and 1 (complete inequality). The Gini is most sensitive to inequality in the middle of the distribution.

2.34 The Theil entropy index is given by:

$$E(1) = \frac{1}{n} \sum_{i=1}^n \frac{c_i}{\mu} \ln \left(\frac{c_i}{\mu} \right)$$

2.35 The Theil entropy index is most sensitive to inequality in the top of the distribution while the Theil mean log deviation measure, given by:

$$E(0) = \frac{1}{n} \sum_{i=1}^n \ln \left(\frac{\mu}{c_i} \right) = \ln \left(\frac{1}{n} \sum_{i=1}^n c_i \right) - \frac{1}{n} \sum_{i=1}^n \ln(c_i)$$

is most sensitive to inequality in the bottom range of the distribution. Unlike the Gini, neither the Theil index nor the mean log deviation measure is easy to interpret except in reference to other countries or the same country at different points in time.⁷

F. Data Needs and Data Source

2.36 All of the measures of poverty described in this chapter impose very strict requirements on the data to be used for such measurement. Is the BiH LSMS up to the task?

(i) Data Needs

2.37 To construct a total consumption measure requires micro-level (household level) data on total consumption as well as the composition of the households. The key components of consumption are:

1. Food consumption
 - a. Purchased
 - b. Home produced
 - c. Gifts
 - d. Consumed outside the home

⁷ For both measures, zero denotes perfect equality. For complete inequality (one person consumes everything), $E(0)$ reaches infinity while $E(1)$ reaches $n \ln(n)$.

2. Education expenditures
3. Expenditures on utilities
4. Use value of housing
5. Use value of durable goods
6. Other non-food consumption
 - a. Purchased
 - b. Gifts

2.38 In addition to the value of consumption, data are also needed on the quantities of food consumed in order to construct the food poverty line. Additionally, price or unit value information is needed to construct regional CPIs to adjust for spatial differences in the cost of living (discussed further in Chapter III, Section C ii). And, finally, data on the composition of households is needed make adjustments for individual consumption (Chapter III, Section C iii).

(ii) Data Source Used in BiH

2.39 The BiH-LSMS collected data on consumption, as well as other aspects of households directly or indirectly affecting their living standards.

2.40 The BiH LSMS provides all of the data needed for measuring welfare levels. The next two chapters describe the procedures used in constructing a consumption aggregate (welfare measure) and the assumptions that underlie the procedures (Chapter III); and the construction of two absolute poverty lines, a food or extreme line and a general poverty line (Chapter IV).

3. CONSTRUCTING A CONSUMPTION AGGREGATE FOR BIH

Below, we outline how the LSMS data were used to construct total household consumption from the six components specified in Chapter II, Section F (i).

A. Food Consumption

3.1 The first step in constructing a consumption aggregate is to value the quantity of food that is consumed. The LSMS collected data on food purchases, home production of food and gifts of food received by households as well as food consumed outside the home. Basic data were collected on 66 food products, or groups of products consumed by the household. These covered fruits and vegetables, dairy, grains and cereals, meat, poultry and fish, beverages and condiments, and staples such as sugar, oils and the like. Households provided information on the quantity and value of each item purchased and produced at home. For all gifts of food, the household provided information only on the value of the gift (as if it had been purchased).

3.2 Data on food consumption was collected for a one month period. Total annual food consumption was calculated as the sum of the value of all purchases, home produced food and all gifts received, times twelve.

3.3 As in any data set, especially complex ones like the BiH LSMS, some data problems were found. As noted in Chapter I, E ii, the LSMS data were not “cleaned” to smooth data anomalies, so that individual users could decide whether and how to do so in light of their individual needs. For the purposes of the BiH Poverty Assessment, a number of adjustments were made to the LSMS data. In cases where there were outliers or missing values, these were replaced with median values to maximize the available information. Outliers were defined as any value greater or less than the median value, plus or minus three standard deviations at the country level. Missing values and outliers were replaced by the median value at the smallest geographic area possible⁸ (group of enumeration areas, or municipality, or Entity, or country).

3.4 In addition to food consumed in the home, data were collected on food expenditures outside the home: meals eaten outside the home (breakfast, lunch and dinner) as well as snacks and other food consumption. Data were collected for a seven day period and annualized by multiplying by the number of weeks in the year.

⁸ If there were less than five prices available to calculate the median price at any given geographic level, the median for the next higher (larger) geographic area was substituted.

B. Non-Food Consumption

3.5 The components of consumption included here are education, utilities, housing, durables, and other non-food consumption (weekly and monthly purchases of personal care and household items, small appliances, transport and recreation). For most of these items, the value of consumption is equal to the expenditure for the item or the monetary value of a gift. For two of these items, housing and durable goods, the actual expenditures does not represent consumption. As discussed in Chapter II, Section C i, the value of the consumption flow associated with using these items is calculated instead.

(i) Education

3.6 Education can be seen as both a consumption item and an investment for future earnings. We have included expenditures on education as part of consumption. Data were collected for all members of the household. For pre-school and kindergarten age children, households provided information on formal and informal payments related to these services. For school-age children, data were provided on costs of annual and special tuition, membership fees for parent associations, school uniforms and clothing, textbooks and school supplies and food and lodging, as well as on other expenditures for tutorials and the like. Households also provided information on informal payments to schools for repairs, maintenance, and classroom equipment. Although information was also collected on the transportation costs associated with schooling this was not included here as it was assumed that this cost was captured in the “other non-food” component of the questionnaire and to include it here would be double counting.

3.7 The information was collected for the school year prior to the implementation of the survey, in other words for the school year 2000-2001. In calculating annual expenditures for pre-school education, checks were made of outliers (as in the other sections) and outliers and missing values were replaced by median values at the Entity level. For primary and secondary school data, outliers and missing values were replaced using municipal level medians. For tertiary education, outliers and missing values were replaced using the Entity level medians. Total household education expenditures are simply the sum of the annualized individual educational expenditures.

(ii) Utilities

3.8 Households provided information on their monthly expenditures on utilities and related services: electricity, district heating, piped gas, gas in containers, oil (liquid fuels), coal, firewood, water and sewerage, central hot water, garbage disposal, land occupation fees, common area fees, radio and TV subscriptions and telephones. Data was collected from households for the month preceding the survey.

3.9 To calculate annual expenditures we needed to take into account the fact that household expenditures on utilities are higher in winter months than in summer months. Thus, additional questions were asked about expenditures levels for oil, coal, firewood, water and sewerage, electricity and piped gas for winter months. The annual expenditures for each of these items were constructed using six months of summer expenditures and six months of winter expenditures.

(iii) Housing

3.10 Calculating the value of housing for inclusion in the consumption aggregate is more complicated than for other consumption items. One consumes housing over a long period of time. Thus the value of housing for inclusion in an annual consumption aggregate must reflect the value of the housing that one receives during the year, not the total value of the housing. A simple example shows the logic of this approach.

3.11 Imagine three households that are exactly alike in their composition and total consumption. The first household rents its flat, the second household owns its flat and the third household lives in a temporary shelter. The consumption aggregate would include the rental payment of the first household. If no value is calculated for the second household's housing, the second household would look poorer than the first, when we know that they are exactly the same. Additionally, the second and third household would have the same consumption level but we know that the welfare of the third household is actually lower than that of the second household as its members live in a temporary shelter. To avoid this type of mis-ranking of households, we need to estimate a value for the housing of the non-renters, i.e., the second and third types of household.

3.12 For households that rent their housing, it is assumed that the monthly (annual) rental payment is equal to the amount of housing 'consumed' in that year. The difficulty arises for households that own their housing. To ensure that the comparison of welfare levels between households is accurate, the value of owned housing must be calculated.⁹

3.13 A two-stage process was used to do this. First, we ascertained the reported monthly rent payment for all households that rent their housing units. We then ran a rent regression for the group of renting households to identify the determinants of rent based on a vector of housing characteristics.¹⁰ Separate regressions were estimated for each of the two Entities. In addition, in both regressions, variables identifying location (municipality) were also included. The characteristics of housing that were found to be significant in determining rental values were: the number of rooms, areas (sq. meters), having central heating, having a telephone, urban or rural location, overall assessment of housing quality, type of housing, and existence of extra rooms (such as a garage, separate bathrooms, cellars etc.).

3.14 In the second stage, once the parameters of the two regressions were estimated, information on the housing characteristics of non-rental households was put into the equations and an imputed value of housing was estimated. This was done separately for FBiH and RS.

⁹ This is typically what is done in National Accounts calculations, although BiH does not yet incorporate such calculations for lack of data.

¹⁰ Such a regression, where the rent is related to characteristics of housing (such as location, basic amenities etc.) is called "hedonic". It assumes that consumers value positively and pay more for attractive dwelling, and value negatively (and pay less for) a dwelling with unattractive characteristics.

(iv) Durable Goods

3.15 All consumption expenditures on durable items are excluded from the consumption aggregate. Instead we include the rental value of consumer durables for which we have ownership information. This value can be called a consumption flow from a durable good. It is derived by estimating the cost of owning a durable good, which involves two elements (as suggested in Luttmer (2000)):

- (i) Depreciation: the drop in value of the good during the course of the year;
- (ii) (Forgone) real interest: the interest one could have earned if one had invested in a financial asset instead of a consumer good, or the interest one has had to pay on a loan taken out to finance the consumer good

3.16 Expressed mathematically:

$$\text{Consumption flow} = \delta V + r V = (\delta + r) V,$$

where δ is the depreciation rate, r is the interest rate, and V is the current value of the good.

3.17 Hence, to be able to estimate the consumption flow of a consumer durable, we need four pieces of information:

- (i) whether the household owns the consumer durable;
- (ii) the value of the durable;
- (iii) the depreciation rate of the durable; and
- (iv) the interest rate

3.18 The BiH LSMS sought information about possession of, estimated current value, and age of 23 categories of consumer durables. This information was used to calculate the consumption flow of each of these 23 categories. The calculation consisted of the three steps summarized below.

Step 1: Estimation of depreciation rate and median new value

3.19 We know the value and age of a consumer durable for a subset of households who (i) report owning each consumer durable, (ii) report the estimated market value of that consumer durable (reported as the value that respondents think they can sell the durable for), and (iii) report its age (time since the purchase or acquisition of each durable). For this subset of households (excluding the outliers defined in Step 2 below), we run a regression of the form:

$$\ln(\text{value}_{k,i}) = v_{0,k} - \delta_k \text{age}_{k,i} + \varepsilon_{k,i}$$

where $\text{value}_{k,i}$ is the expenditure of household i on durable k , $v_{0,k}$ is the log of the value of durable of type k at acquisition, $\text{age}_{k,i}$ is the age of durable k of household i and $\varepsilon_{k,i}$ is an error term.

Step 2: Calculate for each household the current value of its durables

3.20 We can infer the value of consumer durables for households that report owning them. For households that report both the age and the value, we use the reported value if it falls within a factor of 6 standard deviations of the median value of durables of the same type in the country as a whole. For other households, which either do not report the value or whose reported value falls outside the range, we estimate the value of the consumer durables using the estimated depreciation schedule:

$$\hat{V}_{i,k} \equiv (\text{estimated value})_{i,k} = \exp(\hat{v}_{0,k} - \hat{\delta}_k \text{age}_{i,k})$$

where $\hat{v}_{0,k}$ and $\hat{\delta}_k$ are the estimated log of value at acquisition and depreciation rate from the median regressions and $\hat{V}_{i,k}$ is the estimated current value of consumer durable k for household i .

Step 3: Calculate the consumption flow from the durables

3.21 Finally, we calculate the consumption flow from the possession of durable k in household i as:

$$(\text{Consumption flow})_{i,k} = (\hat{\delta}_k + r) \hat{V}_{i,k},$$

3.22 The real interest rate, r , is assumed to be constant at 10 p.a.%.

(v) Other Non-Food Consumption

3.23 Detailed information on other non-food expenditures were also collected from households in the following areas: daily expenditures (tobacco, newspapers, etc.), transportation (fares, fuel, maintenance and parking), household cleaning products, personal hygiene products, clothing and footwear, household furnishings and services, electronic and photographic equipment and small consumer appliances, recreation and leisure activities, and equipment, data on expenditures in each of these categories. Different reference financial services, and special events.

3.24 Households were asked to provide periods were used to help the household correctly recall expenditures. Each expenditure was annualized and the sum of these values was included in the consumption aggregate together with the value of any gifts to the households.

C. Adjusted Total Consumption

3.25 As noted in Chapter II, sections II, C ii and iii, adjustment of households' consumption for the purpose of valid comparisons between them, consists of two steps: price adjustment and adjustment for the composition of a household. Before making these adjustments, this section outlines the structure of total consumption by its key components.

(i) Total Household Consumption

3.26 Total household consumption is the sum of all food and non-food consumption (including derived values as described above for housing and durable goods consumption). Table 3.1 gives an overview of the components included in the consumption aggregate and their relative importance in household consumption.

3.27 Two critical imputations affect the level and the distribution of this total consumption aggregate: (i) the use of self-reported prices (respondents' estimates of the cost of buying of the corresponding item) to compute the value of consumption in-kind from own agricultural production and gifts received; and (ii) the use of imputed values (based on reported market rents and housing characteristics) for owner-occupied housing, instead of declared implicit rents for this category of housing.

3.28 Both of these imputations reflect the current best practice approach to evaluate consumption.¹¹ The first takes into account the difference between producer prices and consumer prices for food-producing households (most of the in-kind consumption). The second is designed to avoid the, typically unrealistically high self-assessment of the implicit housing rents provided by homeowners.

Table 3.1 Composition of Household Consumption

Consumption Categories	Composition of Household Consumption	
	Annual Household Consumption, KM	Percent of total consumption
Food consumed at home	3,766	32.5
Of which: own-production	911	7.9
Of which: received as gift	118	1.0
Food consumed outside of home	552	4.8
Housing	3,920	35.6
Of which: paid rent	68	0.6
Of which: imputed rent	2,316	20.0
Of which: utilities	1,536	13.3
Imputed consumption flow from durables	330	2.9
Other non-food	3,002	25.9
Of which: goods and services purchased	2,066	17.9
Of which: expenditures on education	246	2.1
Of which: daily non-food expenditures	544	4.7
Of which: gifts of non-food goods and services	145	1.3
Total	11,571	100.0

Source: LSMS (2001). Note: Amounts are expressed in KM. No adjustment has been made for regional price differences. The means are weighted by sample weights. The unit of observation is the household.

3.29 On average, consumption is valued at 11,571 KM per household per year. Food and housing are the largest budget items, with 37 (**including food consumed outside of home**) and 36

¹¹ Agnus Deaton and Zaidi Salmon "Guidelines for Constructing Consumption Aggregate", LSMS Working Paper Series, World Bank, 2002.

percent of the total (note that the Croatia HBS data, based on the same data processing methods, give corresponding shares very close to those for BiH, i.e., 36 percent and 32 percent of the total). The imputed consumption flow from consumer durables constitutes only 3 percent of the consumption aggregate. Average actual expenditures on purchases of these types of goods are excluded from the consumption aggregate, but would also amount to 3 percent if included (331.91 KM). Health expenditures, which are excluded for reasons explained earlier, would have amounted to 5 percent of the total (555.29 KM).

3.30 The LSMS data could also be used to construct an aggregate which is closer to actual total personal consumption **expenditure** as measured by in the System of National Accounts (SNA). Such an aggregate would include health expenditures and all types of expenditures on goods and services, but exclude imputed rents and the imputation of the flow of services from durables. It would also use market prices (rather than self-reported prices) for food consumption from own production. It was noted in Chapter II that such a measure presents problems for determining welfare. It is, however, appropriate for comparison with national macroeconomic data. The expenditure aggregate would amount for a total of 9,616 KM per household per year – a slightly lower value than our consumption aggregate, but still very much in the same range. But it is important to keep in mind this approximately 17 percent difference when comparing all results obtained from consumption-based figures to other sources of information or other surveys.

3.31 As discussed in Chapter II, adjustments may need to be made in household consumption data to ensure comparability. One such adjustment might be to take into account changes in prices over time. In the case of the BiH LSMS, however, the reference period was similar for all households, and interviews were conducted within a short time period, so no adjustment is needed for this purpose. Two other possible adjustments identified in Chapter II are discussed in the BiH context below.

(ii) Spatial Price Adjustments

3.32 Spatial (i.e., geographic) differences in prices can cause the same bundle of goods to be more expensive in one region than in another. But these differences do not reflect differences in material well-being. Hence, we need to correct for them.

3.33 We used the Paasche price index to deflate for regional price differences, which is theoretically better than Laspeyres¹² but requires knowledge about the quantities of all goods consumed by each household. The Paasche index for a household living in area r is given by:

$$P_r = \sum_{k=1}^K \left(\frac{Q_{k,r} P_{k,r}}{Q_{k,r} P_{k,0}} \right)$$

¹² See Grosh, Margaret and Paul Glewwe, eds, (2000). *Designing Household Survey Questionnaires for Developing Countries: Lessons from 15 Years of the Living Standards Measurement Study Surveys*, The World Bank, Washington, D.C.

where P_r is the price index for area r , $Q_{k,r}$ is the quantity purchased of good k in area r , $p_{k,r}$ is the price of good k in area r , and $p_{k,0}$ is the reference price of good k . To implement this formula we needed to make a number of choices:

- (i) what price data to use and how to define the reference prices,
- (ii) how to define the regions r , and,
- (iii) what to do when price data are missing.

3.34 We calculated the quantities using the LSMS for 66 food categories and we based our price deflator only on these food price data.¹³ This assumes that regional variations in the non-food prices are similar to regional variations in observed food prices. As no information on unit prices for non-food items was available at the regionally disaggregated level at the time of calculation this was the only feasible way to proceed. The regional (group of enumeration areas) food price index is the arithmetic weighted mean of the food price indices of all households in the area. The municipalities' food price index, P_r^{Food} , is the arithmetic weighted mean of the food price indices of the enumeration areas in the given municipality. Therefore this food price index adjusts for urban/rural price differentials to the extent possible.

3.35 While the LSMS does not report prices, it does report expenditures and quantities for purchased food items. This allows us to calculate unit values for each food item as the ratio of the expenditure to the quantity bought. Though unit values are not as accurate as prices because they may also capture differences in the quality of the item bought, they represent the only data source for regional price differences. We use the unit values from the LSMS to calculate a separate food price index for each household. The reference price, $p_{k,0}$, is found by taking the national median unit value for item k . This ensures that the median unit value are based on a large number of observations and is likely to accurately reflect the true price.

3.36 Regional price differences seem to be substantial. The most expensive areas are the municipalities around Sarajevo while the cheapest area is the rural portion of Republika Srpska. The cost of living difference between these extremes is 30 percent. Analysis of inequality and poverty needs to take into account these regional price variations.

(iii) Per Capita or Per Adult Equivalent

3.37 As previously noted, consumption data in the BiH-LSMS were collected at the level of the household rather than the individual. This means that an adjustment based on some allocation rule must be introduced in order to attribute their share of household resources. This is an important task: as Lanjouw et al (2000) have shown, varying the economy of scale parameter may change the relative poverty risks of different demographic subgroups of the population, notably the elderly and children.

3.38 There are, however, no set rules for calculating the exact adjustment for children and economies of scale (Deaton and Paxson 1996, Deaton 1997). A series of tests using BiH-LSMS

¹³ We chose not to use special price questionnaire files in each enumeration area, but to use the actual purchase prices reported by households in the survey, and to aggregate them to the level of groups of enumeration areas.

data is described in the Annex 1. The results clearly indicate that we do not have, on scientific grounds, any clear reason for selecting one equivalence scale over another.

3.39 Given this problem, it is important that the chosen equivalence scale seems plausible to people familiar with the structure of spending in the country. One way to judge the plausibility of equivalence scale is to consider the implications of the chosen equivalence scale on the monthly expenditures that make households with different compositions equally well-off. A final consideration for the choice of equivalence scale is comparability and ease of communication. The per capita scale is easier to explain to the general public than the OECD scale (“the first adult counts as one, the other adults count as 0.7, and children count as 0.5”), which in turn is much easier to explain than scales involving α s and θ s.

3.40 Combining the results of the tests and the judgment of the BiH statistics team on the plausibility of various scales, and taking into account issues of comparability and ease of communication, we decided to take the per capita scale as our baseline, but also to use other scales to see to what extent different allocation rules produced different results.

4. CONSTRUCTION OF POVERTY LINES IN BIH

Construction of a poverty line involves a number of steps and choices, as already discussed. We now apply these to the BiH 2001 LSMS data to obtain an ‘extreme’ and a ‘general’ poverty line for the country.

A. Extreme or Food Poverty Line

4.1 The first step in constructing a poverty line is to decide on a welfare measure at the level of the individual. The welfare measure used here is per capita annual consumption, as previously discussed. Individuals can be ranked on this basis by consumption level, from lowest to highest. The next step is to determine food consumption patterns, as a basis for constructing an extreme or food poverty line. Because our interest is in people at the lower end of the distribution, the analysis focuses on the average consumption patterns of the bottom 30 percent only, excluding the richer component of the population. As a matter of practice, we exclude the very poorest lowest 10 percent, for two reasons: (i) these people may be so poor that their consumption patterns are unrepresentative of any normal pattern and, (ii) their observed low levels of consumption may reflect measurement error. To avoid these potential difficulties, we use the data for individuals at the 10-30 percent consumption levels. This part of the sample is called the “reference” group.

4.2 Having obtained the reference group’s basic food consumption patterns (average quantities of all food items purchased, received as gifts or consumed from own production), these averages were expressed in terms of calories. This value reflects the patterns of consumption of this segment of the population and, hence, is the basis for the food poverty line.

4.3 The required level of calories per person, per day is set at 2100 kilocalories (K Cal). For the reference individuals, on average, caloric consumption was well above this level (amounting to 3431 K Cal per day per capita on average), so the reference group average amounts were adjusted downward to create a ‘food basket’ that provides 2100 K Cal, with the proportion of calories from each food being the same as for reference individuals. The final step was to convert these food quantities into a monetary value.

4.4 Table 4.1 shows how this was done, including monetary conversion based on multiplying adjusted quantities by observed prices, to yield the food or extreme poverty line. The value of this poverty line was calculated to be 760 KM per person, per year.

4.5 Annex 2 reports the detailed results of nutritional analysis of the food basket derived with this simple method. It shows that in itself this basket does not meet detailed nutritional norm relevant for a population with the demographic structure of BiH. But it also shows that one can

propose a basket with different quantities by item that would cost exactly 760 KM and would meet the most critical food needs to at least the 100% level.

Table 4.1 Converting Food Consumption Patterns into a Food Poverty Line
(per person per day)

Goods	Average Quantity (grams)	KCalories per kilogram	KCalories obtained	Adjusted KCalories	Adjusted quantities (grams/day)	Average Price per Kilogram, KM	Cost Per day (KM)	Cost per year (KM)
Rice	11.6	4150	48	29	7	1.63	0.01	4.2
Bread	189.0	2410	455	275	114	0.87	0.10	36.2
Poultry	27.0	820	22	13	16	4.77	0.08	27.9
...
TOTAL			3431	2100				759.86

Source: BHAS, RSIS, and FIS (2003). Note : Table shows only a partial listing for illustrative purposes. See Annex 2 for detailed description.

4.6 This process illustrates a general point, that the composition of a specific food basket may and should differ across assumptions and methods. Determining a minimum food basket is not an exact science: all minima are based on certain assumptions about the activity levels of individuals, and the cooking methods and dietary habits of the population. What is important is that the minimum as defined approximates to the purchase of a basket that provides consumption of basic nutrients at least at the level of minimum norms, or better. The exact composition of such a basket may differ depending on the methods and assumptions used, but represents a reasonable and consistent approximation of the extreme poverty line.

B. Construction of the General Poverty Line

4.7 As already noted, individuals also have non-food needs. Taking into account the need for non-food consumption requires adding an allowance for non-food goods and services to the food poverty line. The 'upper-bound' method was used here to determine the value of the general poverty line.¹⁴

4.8 To determine the allowance for non-food consumption based on LSMS data, the first step was to select those individuals whose food consumption is equal (plus or minus 5 percent) to the value of the food poverty line, in order to provide a basis for determining the general (food plus non-food) poverty line. The share of this group's total consumption that goes to non-food consumption is then calculated. This share is the 'allowance' for non food consumption that is added to the value of the extreme poverty line to get the general poverty line.

4.9 In BiH, the share of non-food consumption among those whose food consumption equals the value of the food poverty line is 65.5 percent: food consumption represents 34.5 percent. The value of the general poverty line is thus:

¹⁴ For details see: Martin Ravallion (1994), *Poverty Comparisons* Chur Switzerland, Harwood Academic Press.

General Poverty Line= Value of food consumption + Value of Non-Food Consumption

Where:

Food Consumption = Value of Food Poverty Line = 760 KM = 34.5 % of GPL

Non-food Consumption = 65.5 % of GPL

General Poverty Line = $760/0.345 = 2198$ KM= 760 + 1438.

4.10 This method of deriving the general poverty line is the simplest way to determine a minimum monetary value consistent with the consumption patterns of the poor. Other, more complicated methods are described in Annex 3. An application of these methods yields a wide array of choices for setting an absolute poverty line based on LSMS data. This wide spectrum again highlights the basic point that recurs throughout this analysis: setting a poverty line is not an exact science. It needs to include latitude for value judgments and (sometimes differing) expert opinions at every stage. Setting the value of the non-food component is no exception to this rule. We have chosen the simplest method described above because it is the most transparent, easily replicable and intuitive. But it may not be the most accurate method. For example, Annex 3 shows that a poverty line of KM 1840 might be considered as a more robust alternative poverty line. On the other hand, if a particular methodology for setting a general poverty line is not commonly understood, its use will not help national poverty diagnostics efforts. Given the fact that any poverty line is a matter of compromise and convention, and includes value judgments, the team considered the poverty line of around KM 2,200 per capita as the most appropriate for use with the BiH LSMS dataset to analyze poverty in the country.

5. POVERTY AND THE CHARACTERISTICS OF THE POOR IN BIH

Having constructed consumption-based extreme and general poverty lines, for BiH, we can now use LSMS data to determine poverty levels in the country. The key finding is that, in 2001, there was no extreme or food poverty, but almost one-fifth of the population had consumption levels below the general poverty line and, thus, are classified as poor. A second major finding is that consumption-based inequality is low in BiH. This chapter presents detailed information about the extent of poverty and inequality, and about key characteristics of the poor.

A. Poverty

5.1 The first estimate of poverty is based on the headcount index, or the percentage of the population in households whose per capita consumption is below the extreme or general poverty lines. In BiH, there is no measurable extreme poverty: all households in the BiH-LSMS had per capita consumption levels above 760 KM per year. This does not mean that no household anywhere in the country suffers from food poverty: only that such cases are so rare that they are not captured in a sample survey. (It is also important to note that 18.9 percent of the population spends less on food than the value of the minimum food basket. While not all of these people can be called food poor – some may have lower physiological needs than implied by average norms or have deliberately selected low food consumption – this finding supports the judgment that there is definitely a measurable extent of deprivation in the country.)

5.2 Table 5.1 presents a set of poverty indicators for BiH based on the general poverty line. On this basis, 19.5 percent of the population is classified as poor. As the table shows, average poverty rates vary substantially by type of location: urban municipalities have the lowest levels (13.8 percent) while mixed (urban and rural) municipalities have the highest (23.6 percent).

Table 5.1 BiH Poverty Indices (Percent)

Poverty Measures	BiH	Urban	Mixed	Rural
6. Head Count	19.5	13.8	23.6	19.9
95% confidence interval \pm p.p.	± 3.6	± 2.8	± 6.7	± 6.7
Poverty Gap	4.6	2.8	5.7	4.9
Severity of Poverty	1.6	0.9	2.1	1.6
Shortfall	23.5	20.5	24.1	24.4

Source: BiH-LSMS 2001, based on per capita consumption and general poverty line. The type of location is defined according to the 1991 Census classification. Standard errors computed with the stratified sampling design (Kish effect) correction.

5.3 To highlight some of the distributional aspects of poverty, Table 5.1 also provides estimates of the depth (measured as the poverty shortfall or poverty gap) and the severity of poverty (see Chapter II (i)). The **poverty gap** is equal to 4.6 percent.¹⁵ Poverty **severity** is a measure closely related to the poverty gap but gives those further below the poverty line—the poorest—a higher ‘weight’ in aggregation than those closer to the poverty line. Its level in BiH is found to be 1.6 percent. The final variable, which shows a national average **shortfall** of 24 percent, means that the average consumption of the poor falls 24 percent short of the general poverty line.

5.4 These data suggest that the depth and severity of poverty are not extreme, consistent with the moderate level of inequality observed in BiH (discussed in Section B below). They also suggest that both distributionally sensitive measures and poverty incidence move closely in tandem by type of location: locations with high poverty incidence are also characterized by high poverty gap and severity.

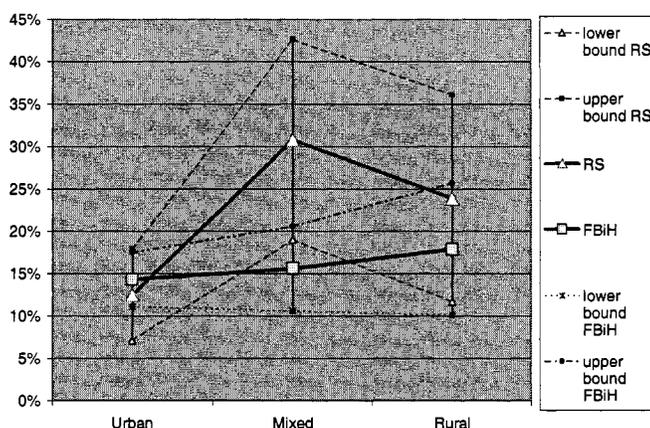
5.5 Statistical estimates obtained on the basis of any sample survey are inevitably subject to some margin of error. Surveys are designed to reveal the characteristics of the “universe” (or all households in the country) by studying only a limited number of cases. As the selection of such cases – i.e., the respondents to be surveyed - is a random process, each result obtained in a survey has a certain probability of matching the corresponding value for the “universe”. Previous surveys conducted in BiH by other agencies used non-probability sampling, and estimates of their precision could not be calculated. The BiH-LSMS sample allows us to calculate the level of precision of our estimates: Table 5.1 reports the 95% confidence intervals for the point estimates of poverty incidence by locality type.¹⁶ The confidence intervals around the poverty point estimates are quite broad, as illustrated in Figure 5.1.

5.6 Figure 5.1 illustrates the caution needed when comparing poverty rates for different groups within a country. Intersecting confidence intervals for groups being compared mean that one cannot reject the null hypothesis that their poverty rates are the same. This does not, however, mean that we have to accept that the two rates are the same. What we learn from failing to reject a zero difference when the point estimate of the difference is substantial is that the BiH-LSMS sample is not large enough to be able to discern a substantively large difference in rates. And, if other sources of information also suggest large differences in point estimates – for example, between Entities - then the observed pattern is evidence of real differences. This underscores the need to draw on other data sources along with the BiH-LSMS data when drawing conclusions.

¹⁵ A poverty gap of 4.6 percent means that if a country could mobilize resources equal to 4.6 percent of the poverty line for every individual and distribute these resources to the poor in the amounts exactly needed to bring each poor individual up to the poverty line, then, in theory, poverty could be eliminated when the transfer was made.

¹⁶ Reported survey results should be accompanied by the standard errors for each value. With almost perfect (95%) certainty (called 95 percent confidence in the text) the true value lies within two standard errors of the mean estimate from the survey. This is the format in which Table 6 reports the LSMS data. For example, a poverty rate of 19.5% for the country has a standard error of 0.018, therefore the Table reports the statistical range for the poverty rate as $19.5\% \pm 3.6$ percentage points ($=0.018 \cdot 2$), meaning that, with 95% probability, the actual value for this variable in BiH lies between 15.9% and 23.1%.

Figure 5.1 Poverty Incidence by Location in the RS and FBiH, 95 Percent Confidence Intervals



Source: BiH-LSMS 2001 Note: The graph shows poverty rates based on the general poverty line by locality type and by Entity (solid lines). The broken lines show upper and lower bounds for poverty rates at 95 percent confidence intervals (i.e., rates are within upper and lower bounds with 95 percent confidence).

B. Inequality

5.7 Table 5.2 presents a set of consumption inequality indices for BiH and the two Entities. As noted in Chapter II, the decile ratio (90/10 percentile ratio) shows what multiple of the consumption of the richest person in the bottom decile is consumed by the poorest person in the top decile. The 90/10 ratio is the product of the 90/50 ratio (“rich to middle” ratio) and the 50/10 ratio (“middle to poor”). The distance between the middle and the poor is noticeably wider in RS than in FBiH, while the rich are above the middle by similar ratio in the two Entities. Another way of comparing groups is to look the share of total consumption going to the top and bottom quintiles. In BiH, the poorest 20% of the population (in terms of consumption) commanded about 9.5% of total equivalent consumption, while the richest 20% used about 35.8%.

5.8 The Gini coefficient, Theil and log mean deviation show inequality to be relatively low in the country. We also report the Gini index adjusted for scale economies according to OECD methodology, which gives a slightly lower inequality level. Finally, the table demonstrates that the distribution of consumption in the two Entities is similar.

Table 5.2 Inequality indices for BiH and Entities

Inequality Index	BiH	RS	FbIH
<i>Decile ratios of the consumption per capita (ratio of consumption of the rich to the poor)</i>			
90/10 percentile ratio	3.29	3.49	3.13
Middle to poor (50/10)	1.82	2.00	1.74
Rich to middle (90/50)	1.81	1.74	1.80
<i>Quintile shares of total national (entity) consumption, percent</i>			
Poorest 20% of the population	9.5	9.2	9.9
Lower middle 20%	14.2	14.3	14.2
Middle 20%	17.9	18.3	17.7
Upper middle 20%	22.7	23.1	22.5
Richest 20% of the population	35.8	35.1	35.8
<i>Other inequality indices</i>			
Gini index	0.26	0.26	0.26
Mean log deviation (Theil)	0.11	0.11	0.11
Entropy index	0.12	0.11	0.12
Gini index: using OECD scale	0.24	0.24	0.23

Source: LSMS 2001 primary data. Note: Unless otherwise stated, all measures use the general poverty line and per capita consumption.

C. Poverty Incidence

5.9 This section uses LSMS data to develop poverty profiles for BiH. Two profiles are presented. The first offers poverty rates for different population groups. The second decomposes the incidence of poverty within each of these groups.

(i) Poverty Rates among Population Groups

5.10 The key findings on poverty rates by population groups are shown in Table 5.3.

5.11 The data presented provide insights into factors associated with poverty and which population groups are most at risk. This information is essential for the development of an efficient poverty reduction strategy.

5.12 The BiH-LSMS reveals several groups whose poverty rates are above the national average. For example, children (especially in the RS) are at a strong disadvantage. IDPs and refugees have a significantly higher poverty rate than other groups. Returnees have a very high poverty rate in RS, but their poverty rate in FbIH is significantly below the BiH average, highlighting different conditions for return in the two Entities and perhaps helping to explain observed return patterns. Another factor differentiating RS from FbIH is that living in mixed (semi-urban) localities in the former is associated with poverty rates twice those prevalent in the latter.

Table 5.3 Poverty Profile: Poverty Rates by Groups

Characteristics (personal and household)	Poverty Incidence, BiH	Standard Error ¹	Poverty Incidence RS	Standard Error ¹	Poverty Incidence, F BiH	Standard Error ¹
Location						
Urban	13.8%	0.014	12.5%	0.027	14.3%	0.016
Mixed	23.6%	0.034	30.8%	0.059	15.6%	0.025
Rural	19.9%	0.034	23.9%	0.061	17.9%	0.039
War displacement status²						
Place of residence unaffected by war	19.4%	0.026	23.2%	0.050	17.5%	0.028
Moved during the war	12.1%	0.016	14.5%	0.035	10.8%	0.015
Returnees (DPs and refugees)	16.7%	0.033	28.4%	0.061	11.0%	0.037
Remain DPs or refugees	34.3%	0.041	38.0%	0.063	29.2%	0.037
Age of a person						
Children (18 and below)	27.2%	0.025	32.2%	0.042	24.6%	0.030
Youth (19-24)	18.1%	0.026	23.9%	0.053	14.4%	0.025
Prime working age (25-49)	19.8%	0.020	25.0%	0.040	16.8%	0.019
Pre-retirement age (50-55F/60M)	14.4%	0.023	21.8%	0.052	9.2%	0.014
Retirement (>55 women, >60 men)	13.0%	0.015	19.1%	0.030	8.6%	0.014
Education of the household head						
None	28.4%	0.052	34.5%	0.092	21.5%	0.049
Primary	25.6%	0.030	31.1%	0.057	21.6%	0.028
Secondary	9.9%	0.017	11.2%	0.026	9.4%	0.022
Secondary Vocational	18.4%	0.023	21.8%	0.040	16.6%	0.027
Junior College	9.8%	0.024	12.2%	0.043	7.8%	0.028
University	2.2%	0.008	2.7%	0.014	2.0%	0.009
General employment status of the household head						
Elderly ³ not working	18.7%	0.022	27.8%	0.042	12.6%	0.022
Working age, not employed	28.1%	0.031	36.7%	0.054	24.7%	0.037
Employed	16.0%	0.021	19.7%	0.043	13.5%	0.020
Detailed employment status of adults⁴						
Economically inactive (ILO)	20.5%	0.021	25.7%	0.042	17.9%	0.024
Student	8.0%	0.024	12.6%	0.062	5.8%	0.018
Unemployed (ILO)	29.1%	0.043	39.0%	0.082	22.0%	0.033
Employed in the informal sector	16.7%	0.028	19.0%	0.044	14.3%	0.037
Employed in the formal sector	12.4%	0.023	18.4%	0.051	8.2%	0.011
Registered labor market status of adults						
Dependent family member ⁵	21.6%	0.028	27.8%	0.054	17.8%	0.027
Pensioner, disabled, student	13.4%	0.013	17.3%	0.026	10.8%	0.013
Registered unemployed	24.0%	0.022	29.1%	0.038	20.8%	0.027
Registered employed	12.4%	0.024	18.7%	0.054	8.2%	0.011
Size of the household						
1 Person	2.8%	0.009	2.9%	0.010	2.7%	0.013
2 Persons	6.3%	0.010	9.4%	0.019	4.6%	0.011
3 Persons	10.6%	0.020	15.9%	0.044	7.2%	0.014
4 Persons	17.4%	0.023	21.2%	0.049	15.2%	0.021
5 and more	33.8%	0.036	40.7%	0.063	29.1%	0.040
Total	19.5%	0.018	24.8%	0.038	16.3%	0.018

Source: BiH-LSMS 2001. Poverty is based on consumption aggregate per capita with adjustment for spatial price variation, and general national poverty line. ¹Note: DPs stand for Internally Displaced Persons. ¹ Standard errors corrected for stratified sample design. 95 percent confidence interval is approx. ± 2 st. errors around the mean. ²Based on migration module, for children below 15 based on household head status. ³ Pension age ⁴The employment status is defined according to the ILO criteria (see Chapter I for details of the definition). ⁵ Not working, not a pensioner or disabled, and not registered as unemployed

5.13 Another group with a higher than average risk of poverty are the unemployed and discouraged workers. The unemployed have poverty rates that are nearly twice as high as those among the employed. And, finally, education, or the lack of it, is also associated with elevated poverty rates; individuals living in households with a head of household with only a primary education or less are about three times more likely to live in poverty than those where the head of household has a junior college education.

5.14 The data also identify groups that, contrary to common belief, are **not** among the poorest, and actually do not fare much worse than average. One of these is the elderly. Elderly individuals of pension age are less likely to be poor than an average person in the country. Perhaps not surprisingly, another such group is those employed, especially in the formal sector. Those working in the informal sector have a somewhat higher poverty rate, but their rate is still below the national average.

5.15 It is important to note that some groups perceived by the public as especially vulnerable and requiring specific, well-targeted help (Roma women, for example, or IDPs in collective centers) are not covered adequately by the LSMS sample. These groups are either too small or do not fall into the household sample frame. Qualitative data or additional targeted sampling of people in these groups will be needed to assess their situation adequately.

Decomposition of Poverty within Population Groups

5.16 Table 5.4 decomposes the incidence of poverty within each of the broad categories identified in Table 5.3, showing the percentage breakdown of each category's poverty incidence by subcategory. A number of features of the poor in BiH emerge from the analysis. For example, poverty in Bosnia and Herzegovina tends to have a young face: around a third of all poor people are below 18. Therefore issues related to child welfare will be central for developing a strategy to reduce poverty in the long-term.

5.17 The importance of education is reinforced by the finding that just under 60% of the poor live in households where the household head has only primary education or less. Thus, an emphasis on education reform - helping to offer the young a better education, and to provide educational opportunities for older people with little schooling - could improve the prospects of a large share of the poor.

5.18 A third important finding is that the data reject the common perception that poverty in BiH is fundamentally the result of unemployment. The unemployed actively searching for work (ILO definition) account for only 12.7 percent of the poor. If we look at the household as an economic unit, the conclusions are even stronger. Only one-third of the poor live in households where the head is of working age and not employed. By contrast, over 40 percent of the poor live in households where the household head is working. It should be noted, however, that the unemployed do have a higher poverty rate than the employed or inactive persons. But, because this group is not large relative to others, the fact that the unemployed have a higher poverty rate does not mean that they represent a large fraction of the poor. Over 20 percent of the poor are retired or incapable of working. If we add the disabled to this group, then close to a quarter of the poor in the country are not able to work. Thus labor market programs will affect them only indirectly (through increased incomes of other household members).

Table 5.4 Poverty Profile: Composition of the Poor Population by Groups (percent)

Characteristics (personal and household)	Share in Population, BiH	Share among the Poor, BiH	Share in Population, RS	Share among the Poor, RS	Share in Population, FBiH	Share among the Poor, FBiH
Location						
Urban	25.6	18.2	18.6	9.4	29.9	26.3
Mixed	31.6	38.2	43.6	54.2	24.3	23.3
Rural	42.8	43.7	37.8	36.4	45.9	50.5
War displacement status¹						
Place of residence unaffected by war	46.2	45.9	40.1	37.6	49.9	53.6
Moved during the war	29.6	18.4	28.4	16.6	30.3	20.2
Returnees (DPs and refugees)	7.6	6.5	6.6	7.5	8.3	5.6
Remain DPs and refugees	16.6	29.2	24.9	38.3	11.5	20.7
Age of a person						
Children (18 and below)	24.7	34.4	22.2	28.9	26.2	39.6
Youth (19-24)	9.1	8.5	9.2	8.9	9.0	8.0
Prime working age (25-49)	35.1	35.7	34.4	34.7	35.6	36.6
Pre-retirement age (50-55F/60M)	9.9	7.3	10.9	9.5	9.3	5.2
Retirement (>55 women, >60 men)	21.3	14.2	23.4	18.0	19.9	10.5
Education of the household head						
None	7.9	11.5	11.0	15.3	6.0	7.9
Primary	35.7	46.9	39.4	49.5	33.4	44.6
Secondary	13.0	6.6	9.5	4.3	15.1	8.7
Secondary Vocational	34.1	32.2	31.7	28.0	35.5	36.2
Junior College	4.6	2.3	5.3	2.6	4.1	2.0
University	4.8	0.5	3.0	0.3	5.9	0.7
General employment status of the household head						
Elderly ² not working	25.5	24.5	27.2	30.6	24.4	18.9
Working age, not employed	23.0	33.2	16.9	25.1	26.8	40.8
Employed	51.5	42.3	55.8	44.3	48.8	40.4
Detailed employment status of adults³						
Economically inactive (ILO)	47.3	53.8	40.9	45.5	51.3	62.0
Student	3.6	1.6	3.0	1.6	4.0	1.6
Unemployed (ILO)	7.9	12.7	8.5	14.3	7.5	11.1
Employed in the informal sector	15.0	13.9	19.9	16.4	11.9	11.4
Employed in the formal sector	26.3	18.0	27.8	22.1	25.4	14.0
Registered labor market status of adults						
Dependent family member ⁴	31.5	39.0	30.5	37.4	32.1	40.5
Pensioner, disabled, student	30.9	23.7	31.5	24.0	30.6	23.3
Registered unemployed	16.0	21.9	15.5	19.9	16.3	23.9
Registered employed	21.6	15.4	22.6	18.6	21.0	12.1
Size of the household						
1 person	4.9	0.7	5.2	0.6	4.8	0.8
2 persons	13.6	4.3	12.5	4.7	14.2	4.0
3 persons	18.1	9.8	18.7	12.0	17.7	7.8
4 persons	29.5	26.3	28.0	24.0	30.4	28.4
5 persons and more	34.0	58.8	35.7	58.6	32.9	59.0
Total	100	100	100	100	100	100

Source: BiH-LSMS 2001. Poverty is based on consumption aggregate per capita with adjustment for spatial price variation, and general national poverty line. Notes: ¹ Based on migration module, for children below 15, information imputed from the migration status of the household head ² Of pension age ³ The employment status is defined according to the ILO criteria (see Chapter I for details of the definition) ⁴ Not working, not a pensioner or disabled, and not registered as unemployed

Finally, while poverty rates do vary across locations, poor individuals can be found throughout BiH. Half of the poor in BiH are located in the RS, half in the FBiH. Less than 20 percent of the poor live in predominantly urban locations; hence, poverty predominates in mixed or rural communities across the country.

6. CHECKS FOR ROBUSTNESS OF POVERTY FINDINGS

As indicated in previous chapters, the measurement of welfare using household data is based on a range of decisions and assumptions. It is therefore important to test the results of the analysis against major alternative assumptions to determine how robust the findings are. If a change of assumptions drastically alters findings, then caution will be needed in using the results reported in Chapter V.

The poverty profile has suggested that poverty is importantly correlated with factors such as the type of municipality in which people live, displacement status, education level of the household head, employment status and household size. In this chapter, we test the robustness of these findings to changes in assumptions with respect to (i) household economies of scale (section A below) and (ii) alternative poverty lines (section B), in order to determine whether they remain valid. Section C discusses a third possibility – using a possible alternative measure of welfare based on either income or expenditure rather than on consumption.

A. Robustness Checks with Respect to Equivalence Scales

6.1 We start by seeing whether or not incorporating economies of scale in the analysis would change the basic profile of the poor in BiH. As noted earlier, our analysis did not take account of economies of scale, but instead used a simple per capita allocation rule that assigned household consumption equally among all household members. We need to check for the robustness of our results to this choice. The use of a per capita measure of individual welfare assumes that there are no economies of scale in household consumption, in the sense that the per capita cost of reaching a specific welfare level does not fall as household size increases. If this assumption is relaxed, it could affect comparisons of poverty between large and small households, and in turn the rankings of different household groups: for example, households made up of the elderly are typically small, while those with many children are definitionally relatively large.

6.2 The LSMS data for BiH do not offer evidence of statistically significant economies of scale. Nevertheless, if we were to find that deviations from the zero economies of size assumption result in sharp re-rankings between groups, then there would clearly be reason for caution in interpreting the baseline poverty profile results. Thus we need to check whether some groups are systematically re-ranked if we run a poverty profile with a different equivalence scale assumption. If we do not find significant changes, we can conclude that our poverty profile is robust to the choice of equivalence scale.

6.3 To simplify the test we construct a set of poverty measures using the OECD I (old) equivalence scale¹⁷ and the OECD II (new) equivalence scale.¹⁸ The OECD II equivalence scale implies substantially greater scale economies than the OECD I scale.

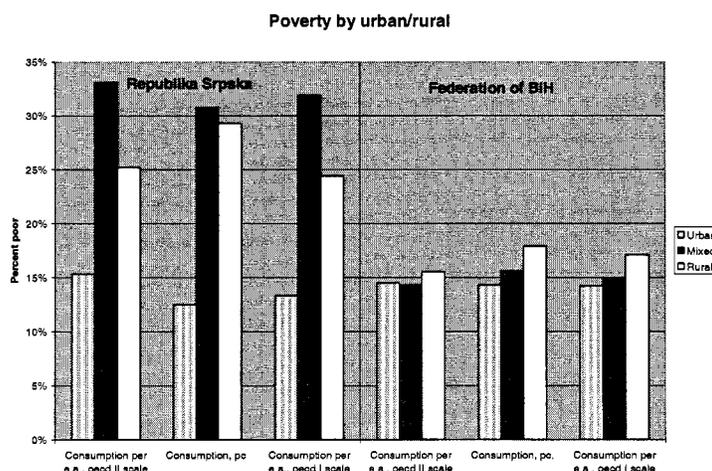
6.4 As any assumption about scale economies affects household level welfare for all households with more than one member, we should not apply the poverty line derived for per capita values to welfare indices derived on the basis of a per adult equivalence scale to get poverty status. Instead, we choose the poverty line so that overall poverty incidence remains the same but allows the economies of scale to re-rank households. That gives us results which are easily comparable.

6.5 The goal of this comparison is to determine the extent to which taking into account economies of scale would affect the overall profile of poverty that we have constructed. Therefore, we test a set of key poverty profile results for the measurement assumptions, looking at the changes in incidence by location, displacement status, labor market status, education and household size.

(i) Location and Poverty

6.6 Figure 6.1 shows poverty rates under different equivalence scales by municipality type. Though there is some slight variation in poverty incidence according to the assumptions used, with the OECD II scale leading to a slightly higher poverty incidence in urban areas, the overall results and relative ranking are broadly consistent across all scale assumptions, and therefore are robust to these adjustments.

Figure 6.1 Poverty by Municipality Type, Comparison of Equivalence Scales



Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the level of poverty risk for a type of municipality (see legend on the right). On the horizontal axis are the methodologies used to measure poverty: per capita is in the centre of each panel, the OECD II scale is to the left and the OECD I to the right. Comparing the height of the bars inside each panel, we can see to what extent poverty rates are robust to economies of scale adjustments.

¹⁷ Where the first adult counts as 1.0, every subsequent adult as 0.7, every child as 0.5 of an “equivalent adult”.

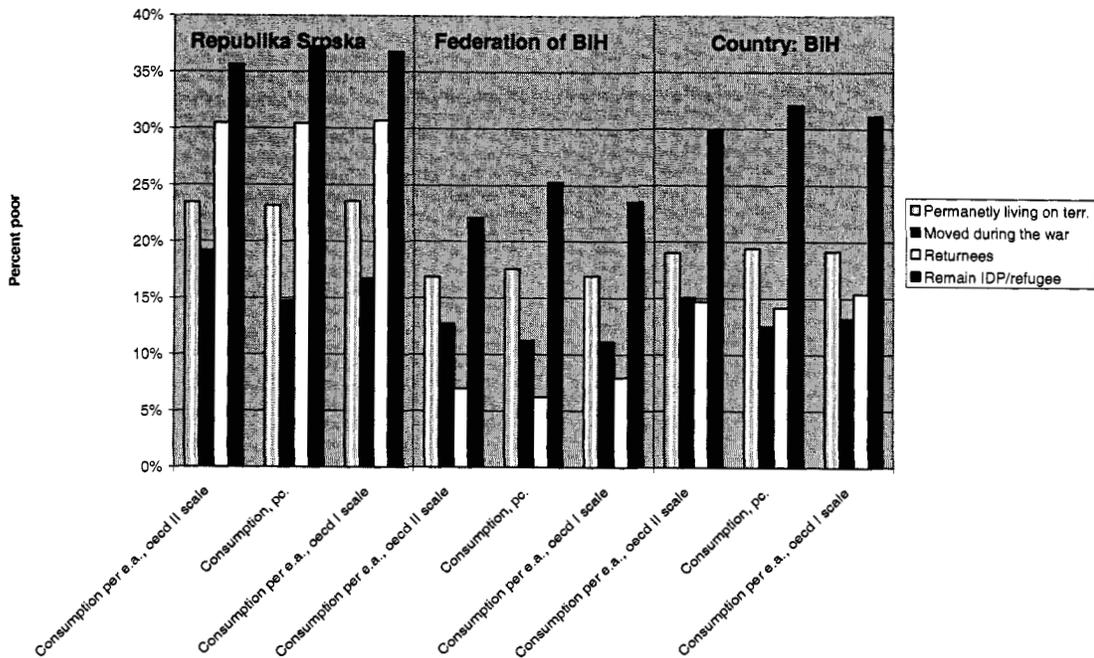
¹⁸ Where the first adult counts as 1, every subsequent adult as .5, every child is 0.3 of an “equivalent adult”.

6.7 Note that the mixed municipalities keep their rank as poorest in RS. Thus the poverty profile results are reasonably robust to changes in the methodology regarding the scale economies and the equivalence scale, in a sense that poorest and richest regions preserve their rank across methods.

(ii) Poverty by Displacement Status.

6.8 Figure 6.2 provides a comparison by residence status (returnee, displaced, refugee, etc), using the different equivalence scales. The figure shows how remarkably robust the conclusion about the relative poverty of IDPs and returnees are to different measurement assumptions.

Figure 6.2 Poverty by Displacement Status, Comparison of Equivalence Scales



Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for a group (see legend on the right). On the horizontal axis are the methodologies used to measure poverty: per capita is in the centre of each panel, the OECD II scale to the left and the OECD I scale to the right. Comparing the height of bars inside each panel, we can see whether the poverty rate is robust to economies of scale adjustments and comparing the same type of bar across panels one sees whether rates for a group are the same across Entities.

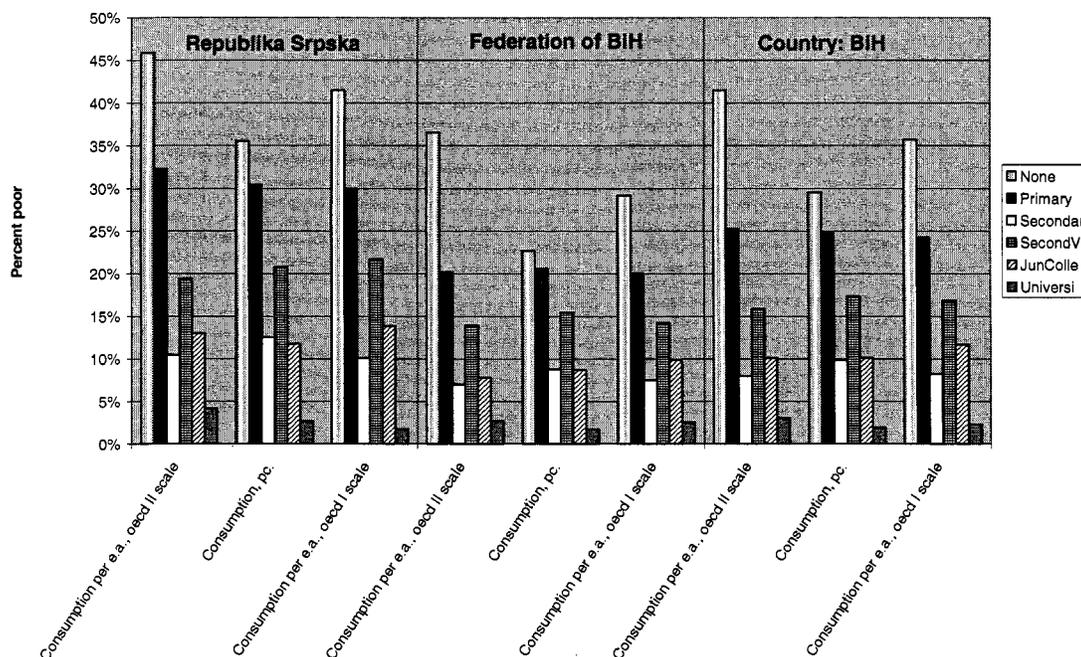
(iii) Education of the Household Head

6.9 Figure 6.3 shows that education levels, which are a key determinants of poverty, maintain their importance regardless of the equivalence scale adopted. The per capita scale (in the center of each panel) makes the profile somewhat “flatter” (i.e., it reduces differences between the least

educated and the other education categories) than the two OECD scales, suggesting a possible relationship between the level of education of the household head and household size, but the ranking is always preserved and shows remarkable stability with respect to equivalence scale assumptions.

Figure 6.3 Poverty by Education of Household Head,

Comparison of Equivalence Scales



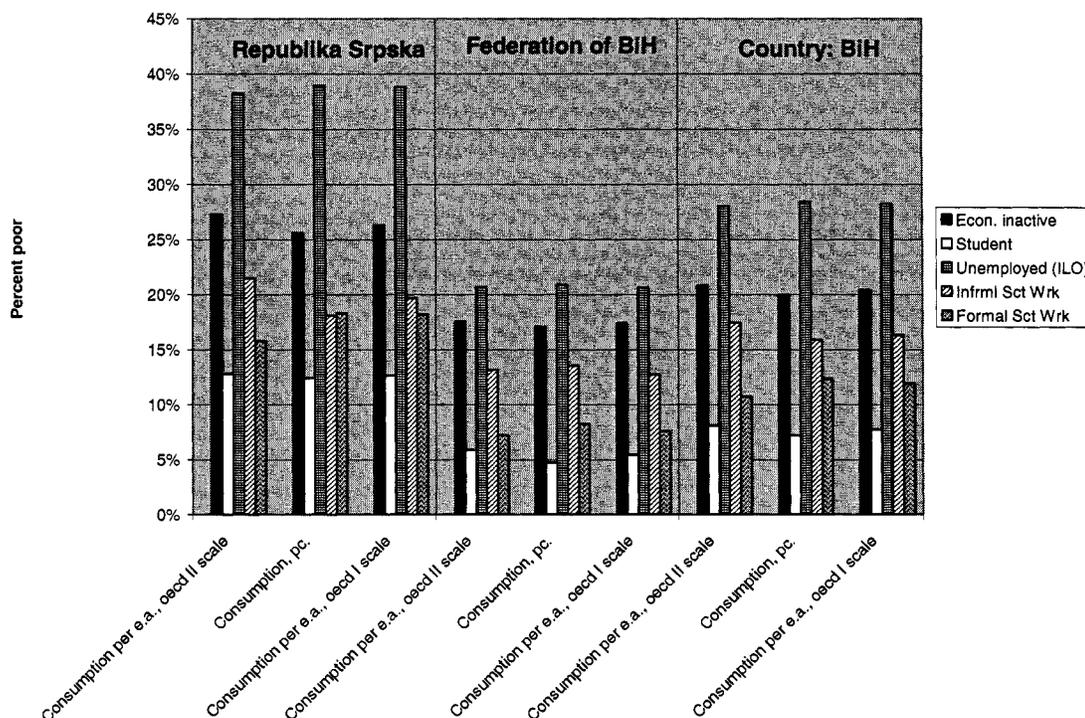
Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for an educational category (see legend on the right). On the horizontal axis are the methodologies used to measure poverty: per capita is in the centre of each panel, the OECD II scale to the left and OECD I to the right. Comparing the height of bars inside each panel, we can see the extent to which the poverty rate is robust to economies of scale adjustments. Comparing the same type of bar across panels one sees whether rates for a group are the same between Entities.

(iv) Employment Status

6.10 We use three different measures of employment status to address the effects of including economies of scale in the poverty numbers: the standard (ILO) definition of labor force status; the definition of labor force status using the BiH administrative classification; and status of the household head, using the ILO definition. The standard, or ILO definition classifies a person as employed if he or she is presently working or on leave from a job. The unemployed are all those who do not presently have a job, are actively searching for employment and are able to take a job at once if it were offered to them. All others of working age are classified as inactive. The BiH administrative classification considers those of working age and registered as not working at the Employment Service Office as unemployed, regardless of whether they are actually inactive or, even in many cases, employed.

6.11 Figure 6.4, which compares the relative risk of poverty by employment status across methodologies using the ILO standard definition, offers a robust picture: the unemployed have much higher risk of poverty regardless of the method used to measure poverty. In all variants the unemployed clearly stand out, while employment in all cases is clearly associated with lower poverty rates. There is also a clear distinction between the two Entities, whichever equivalence scale is used.

Figure 6.4 Poverty by Employment Status of Individuals (ILO Definition), Comparison of Equivalence Scales

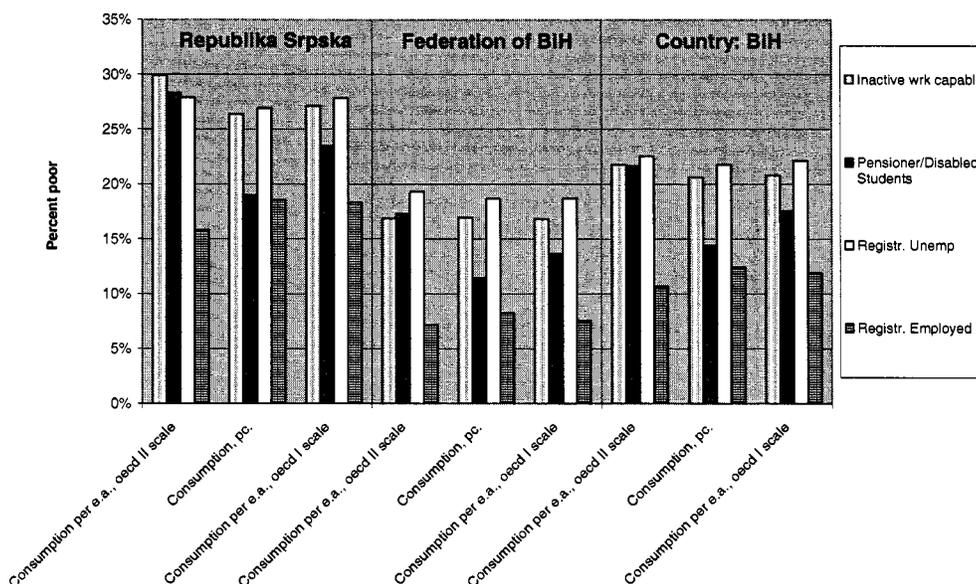


Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for an educational category (see legend on the right). On the horizontal axis are the methodologies used to measure poverty: per capita is in the centre of each panel, the OECD II scale to the left and OECD I to the right. Comparing the height of bars inside each panel, we can see the extent to which the poverty rate is robust to economies of scale adjustments. Comparing the same type of bar across panels one sees whether rates for a group are the same between Entities.

6.12 Figure 6.4 presents the same comparison of equivalence scales with respect to employment status, but uses the BiH administrative classification of joblessness rather than the ILO definition used in Figure 6.4. It confirms the robustness of the findings across different equivalence scales. Inspection of Figures 6.4 and 6.5 also shows that the poverty rate for the unemployed is much higher under the ILO definition than under the administrative (registered unemployed) definition, as would be expected from the discussion of this variable in Chapter I.

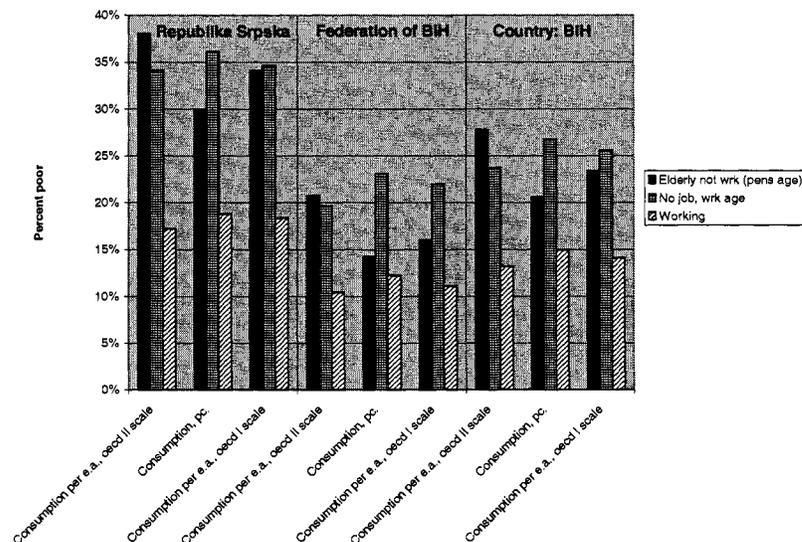
6.13 Finally, Figure 6.6 looks at the effect of using different equivalence scales when the employment variable used is the employment status of the household head, using the ILO definitions. Here, we start to see some differences across groups depending on the equivalence scale used, because demographic factors influence this set of outcomes more than the previously listed results. For example, both OECD scales give relatively smaller differences between poverty rates for households headed by the elderly and households headed by jobless, working age adults than does the per capita scale. This result reflects differences in household size rather than deep underlying labor market determinants. Taking Figures 6.4, 6.5 and 6.6 together leads to the conclusion that thus the poverty profile results are more robust across equivalence scales in the case of individual labor market status, especially using the ILO definition of unemployment.

Figure 6.5 Poverty by Employment Status of Individuals (BiH Administrative Classification), Comparison of Equivalence Scales



Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for an educational category (see legend on the right). On the horizontal axis are the methodologies used to measure poverty.

Figure 6.6 Poverty by Employment Status of Head of Household (ILO Definition), Comparison of Equivalence Scales

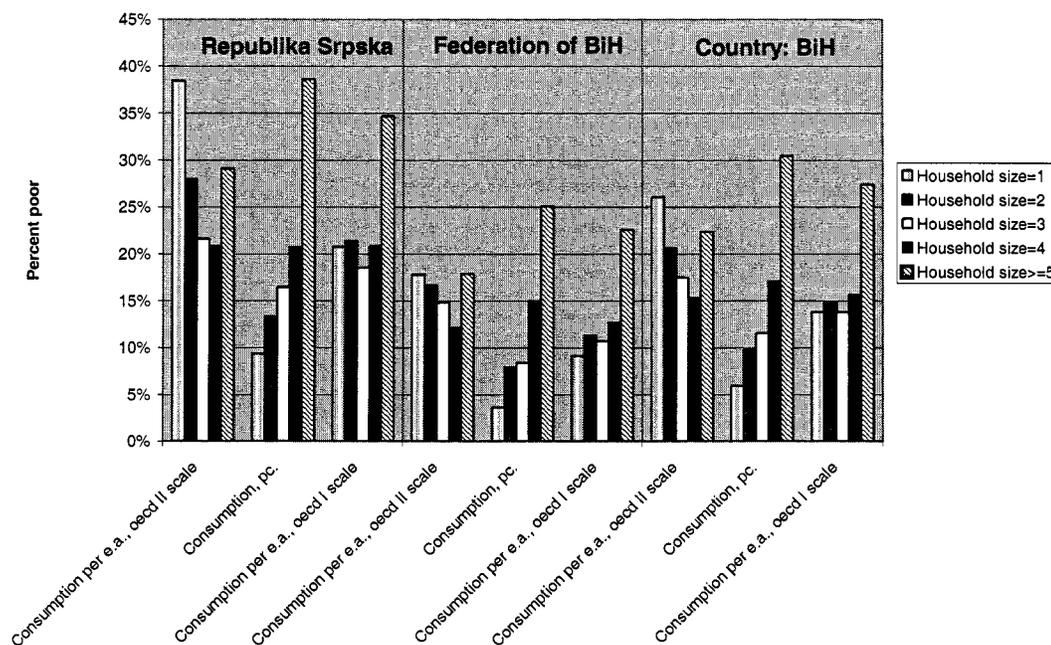


Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for an educational category (see legend on the right). On the horizontal axis are the methodologies used to measure poverty.

(v) Household Size

6.14 Poverty by household size is the variable that is expected to be most sensitive to economies of scale assumptions. And this is indeed what we find (see Figure 6.7). The poverty profile has a very clear stepwise shape using the per capita scale: larger households are poorer than smaller ones. Controlling for economies of scale and the differential cost of children, however, reduces the differences in poverty rates by household size (i.e., the profile becomes much flatter). Note, however, that large households remain the poorest even controlling for scale economies using the OECD I scale. The OECD II scale produces a profile that reverses the relative position of one-member households, making them the poorest category by household size. Thus population sub-groups likely to fall into this category (i.e. the elderly) have much higher poverty rates using this equivalence scale. Nevertheless, even the OECD II scale maintains the picture of an elevated poverty rate for the largest households (5 and more members).

Figure 6.7 Poverty by Household Size, Comparison of Equivalence Scales



Source: BiH-LSMS 2001. Note: The three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represents the level of poverty risk for an educational category (see legend on the right). On the horizontal axis are the methodologies used to measure poverty.

6.15 The finding that emerges from this section is that, almost without exception, the key determinants of poverty and economic vulnerability remain essentially the same regardless of the equivalence scale used.

B. Robustness Checks using Alternative Poverty Lines

6.16 A second way of checking the robustness of the findings is to look at the possible impact of changing the value or level of the poverty line itself on key factors associated with poverty in BiH. To do this, we construct two alternative poverty lines to test whether the profiles of those just above our general poverty line and those well below this general (or baseline) poverty line differ significantly from the characteristics of the baseline poor. The first alternative sets the poverty line 50% higher. This produces an overall poverty incidence of 53.1 percent. The second alternative is lower (as is the line that is often used in BiH to trace the evolution of poverty over time): it is set at KM 200 per month per family of four. Applying per capita conversion to this line, we get a value that is one third of the general poverty line that we have calculated. Applying this lower line to the per capita consumption measure produces a poverty incidence of just 5.4 percent. Obviously, changing the value of the poverty line changes the overall incidence of poverty. But what we are concerned about is whether alternative poverty lines re-rank households in such a way as to change the profile of poverty. To focus on this and to make results across different poverty lines

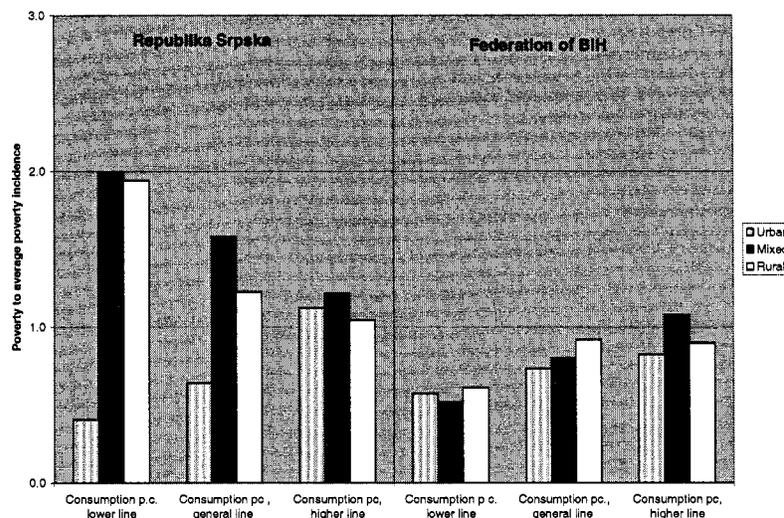
comparable, the incidence of poverty for each group is expressed in relative terms, i.e. divided by the national poverty rate for each line.

6.17 To test whether key poverty profile results are sensitive to the level of the poverty line, we use the same key variables as in the previous section - location, displacement status, labor market status, education and household size.

(i) Location and Poverty

6.18 In Figure 6.8 we look at poverty by type of municipality.

Figure 6.8 Poverty by Location Comparing Alternative Poverty Lines



Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

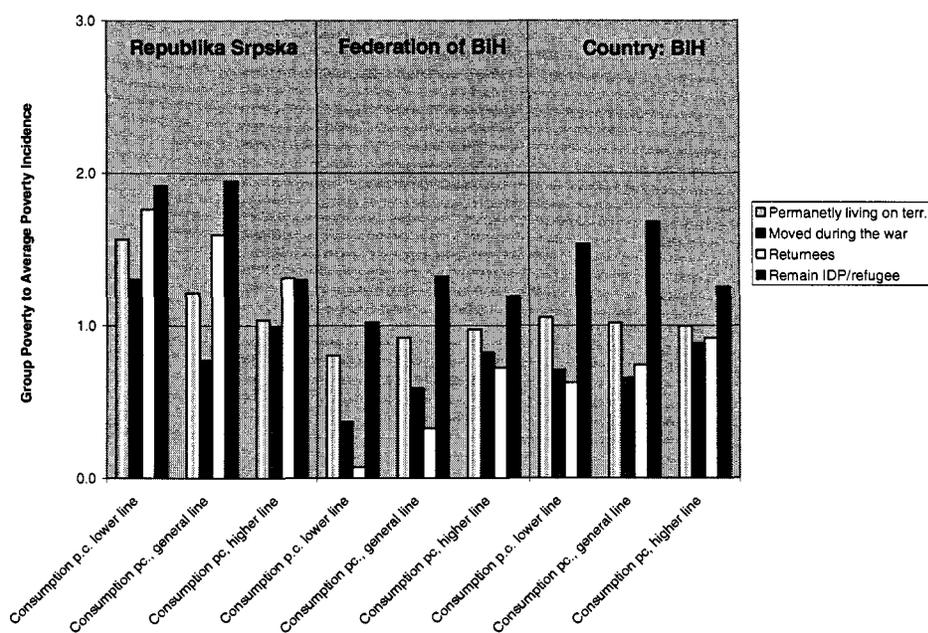
6.19 There are significant changes in poverty incidence by type of municipality. For example, the lower alternative line produces a much sharper poverty profile in RS (the lower line gives a value for mixed municipalities that is twice the value using the higher line, and about 25% higher than that under the “general” baseline). Using the higher alternative poverty line reduces differences by municipality types, but the overall profile is preserved with mixed municipalities in the RS having the highest poverty values. In the Federation, differences between municipality types by alternative poverty lines are only slightly more pronounced than for the baseline; the main exception is the significantly different pattern derived from using the higher poverty line, with mixed municipalities scoring higher than both rural and urban localities.

6.20 Nevertheless these results show some sensitivity to changes in the poverty line, in the sense that the poorest and the richest localities do not always preserve their rank across sets of lines and Entities.

(ii) Poverty by Displacement Status

6.21 Figure 6.9 compares poverty by displacement status using different poverty lines. It shows that the conclusion about the poverty of IDPs and refugees and returnees is extremely robust to different measurement assumptions.

Figure 6.9 Poverty by Displacement Status Comparing Alternative Poverty Lines



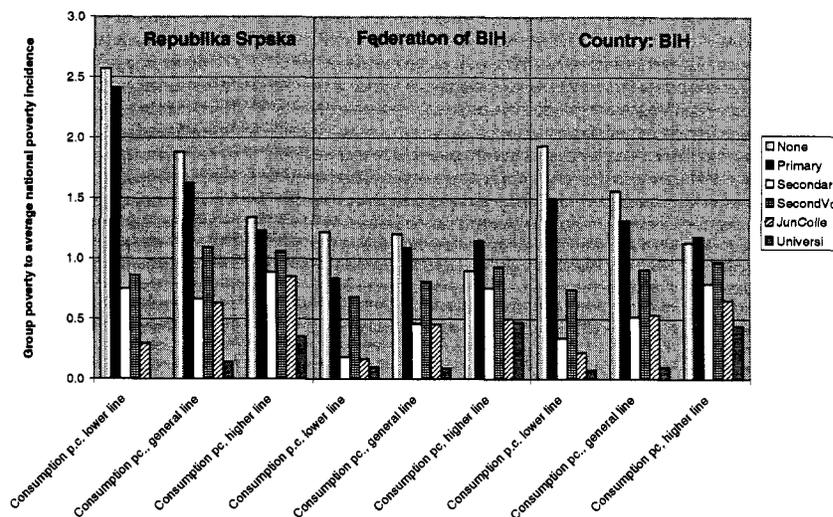
Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

(iii) Education of the Household Head

6.22 Figure 6.10 shows the consistent ranking of poverty incidence by different levels of household head’s education level regardless of the poverty line used. Using the lower poverty line (on the left of each panel) makes the profile “sharper” (i.e. increasing differences between

education categories) compared to the baseline, suggesting a concentration of household headed by persons with low education at the bottom of the consumption distribution, especially in the RS.

Figure 6.10 Poverty by the Level of Education of Household Head Comparing Alternative Poverty Lines

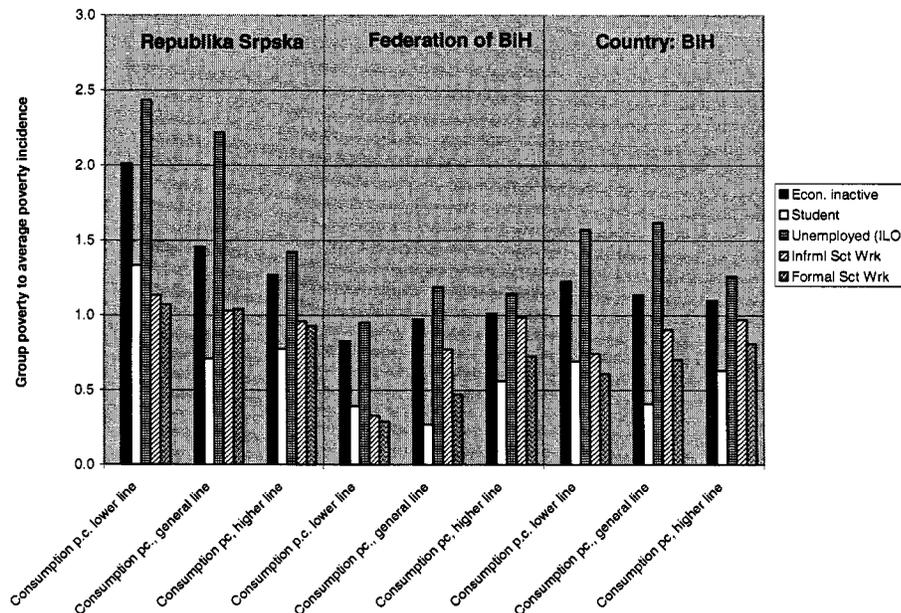


Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

(iv) Employment Status of Adults

6.23 Again, using the three ways of looking at labor market status—the ILO definition, the BiH administrative definition, and the labor market status of the head of household (on the ILO definition)—the results are quite robust to the choice of poverty line. The conclusions are stable and robust, regardless of the poverty line used. In all variants, the unemployed have higher poverty rates, while those with jobs have lower rates. Rankings by labor market status are also similar across the two Entities, regardless of the poverty line used. Figure 6.11 provides the information for individuals, using the ILO definition.

**Figure 6.11 Poverty by the Employment Status of a Person
Comparing Alternative Poverty Lines**

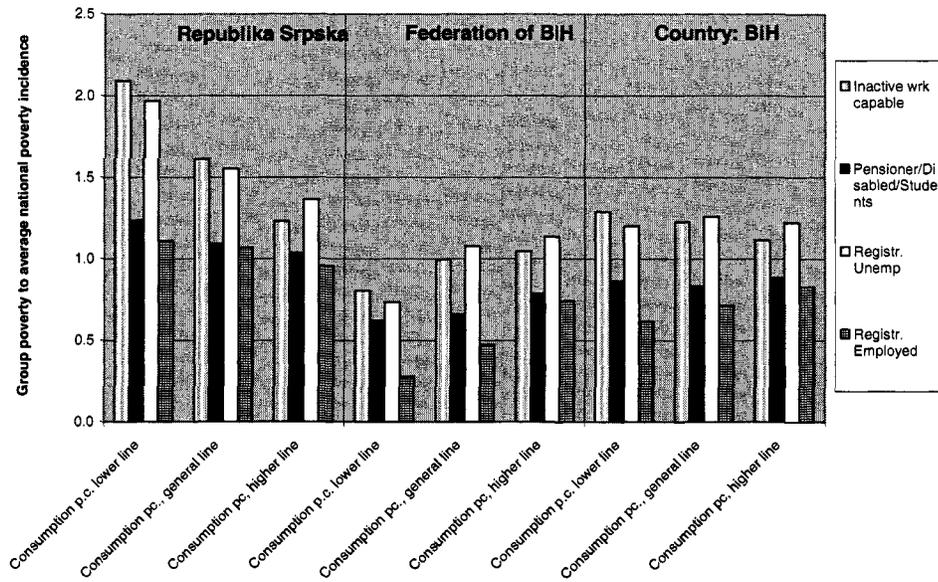


Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

6.24 Figure 6.12 also provides information on poverty levels by labor market status based on different poverty lines, but here using the BiH administrative definition of labor market status. As in the case of the comparison using different equivalence scales, the Figure 6.12 emphasizes the robustness of poverty rates by labor market characteristics, and a comparison of Figures 6.11 and 6.12 shows poverty rates to be higher using the economically based ILO definition than with the administrative one.

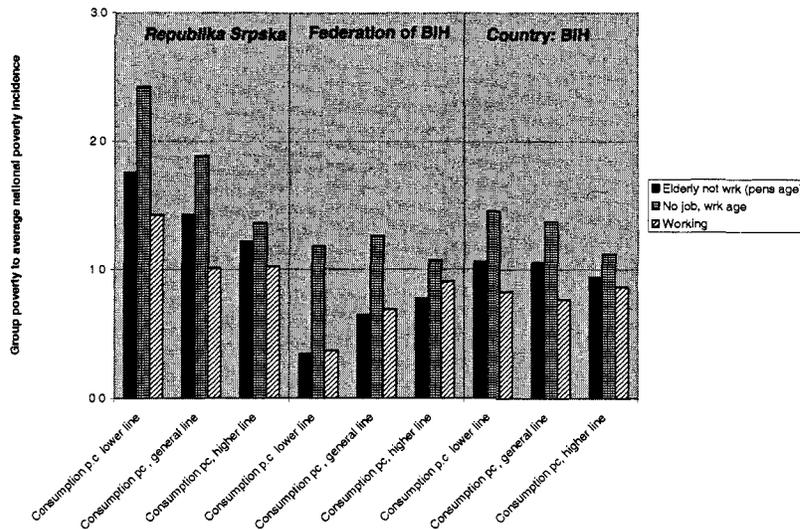
6.25 Finally Figure 6.13 looks at relative poverty rates based on the labor market status of the household head. Unlike the earlier robustness check for economies of scale using this variable, the pattern of poverty incidence by employment status remains similar regardless of the poverty line used.

Figure 6.12 Poverty by Registered (Official) Labor Force Status of Adults Comparing Alternative Poverty Lines



Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

Figure 6.13 Poverty by the Employment Status of the Household Head Comparing Alternative Poverty Lines

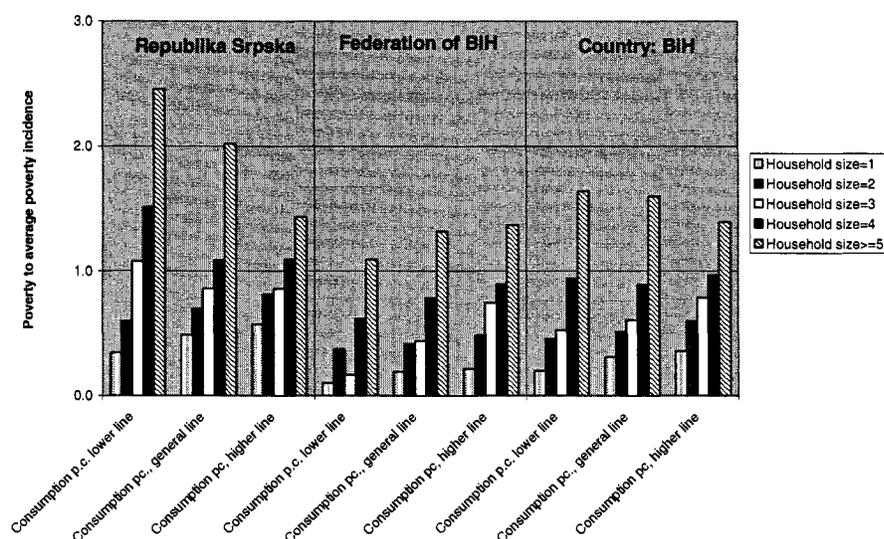


Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

(v) Household Size

6.26 Poverty by household size is the demographic variable that was shown to be the most sensitive to different equivalence scales. This is not the case with respect to different poverty lines. Indeed, as Figure 6.14 shows, there is near complete stability of patterns of poverty incidence by household size for the different poverty lines tested here. The poverty profile has a clear stepwise shape in virtually every case. Thus this variable is robust to changes in the level of the poverty line (but not, as already noted, to adjustment for economies of scale).

Figure 6.14 Poverty by Household Size Comparing Alternative Poverty Lines



Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represents the relative poverty status of a group (see legend on the right). The horizontal axis shows the methodologies used to measure poverty: the baseline in the center, the 33% lower poverty line to the left and the 50% higher line to the right. Comparing the height of bars inside each panel shows whether poverty incidence is robust to the poverty line chosen.

C. Robustness Checks Using Alternative Definitions of Well-Being

6.27 As discussed in earlier chapters, the data on poverty in this study have been developed using consumption as the basic measure of welfare.

6.28 In principle the welfare aggregate could be defined in terms of income or expenditure, rather than in terms of consumption. In theory, therefore, one such test might be to compare the poverty rate obtained using consumption-based and income-based measures. As previously discussed, however, income is often measured with a large degree of error in household surveys. In the BiH case, the experience of both the pilot and the full surveys showed a large degree of under-reporting of self-employment or informal labor. On average, reported cash income of households in the LSMS is just 1/2 of reported cash expenditures, meaning that respondents did not

report their true income levels. Thus the total income aggregate is probably not a good measure to use for comparative purposes, because it is not possible to determine whether differences are due to under-reporting or to the different concepts embodied in income and consumption. We therefore do not include an income-based test in the sets of robustness checks described in this chapter.

6.29 A second possibility is to measure poverty on the basis of expenditure. While we have chosen a consumption-based measure as the most appropriate for the purposes of this study, there may be elements of the process used to construct it - for example, using imputations to value owner occupied housing and consumer durables - that could drive possible alternative results. An expenditure-based welfare measure differs from a consumption-based one in three major respects: (i) it does not include any imputations for rental values of housing or flow of services from durables, (ii) it includes expenditures that may not necessarily be considered as welfare-increasing on technical grounds; (iii) it uses market prices, rather than own valuations reported by respondents, to value food items that are own-produced or received as gifts and consumed by households. In this sense, this aggregate is very much aligned with household expenditures collected and constructed in household budget surveys.

6.30 It is possible to check the robustness of these data by constructing an alternative welfare aggregate from the BiH LSMS which is closer to the standard statistical definition of total personal expenditure as measured by the national accounts. An expenditure-based aggregate includes health expenditures and all types of expenditures on goods and services, but excludes imputed rents for housing and flows of services from durables. It also uses market prices (rather than self assessment evaluations) for food consumed from own production. While we consider an expenditure-based measure to be inappropriate for welfare measurement as explained earlier, it is appropriate for comparison with macroeconomic data. This measure yields a welfare aggregate of 9616 KM per household per year – a slightly lower value than our consumption aggregate. The roughly 20% difference should be kept in mind while comparing results obtained from consumption based figures to other sources of information or other surveys.

6.31 That having been said, the total value for the expenditure aggregate is reasonably close to the consumption aggregate, and the measures for inequality are also similar. Using the expenditure aggregate to develop the poverty line needed to calculate poverty rates gives a value that differs from the poverty line used in this report, since the structure of expenditures with respect to food and non-food items differs from a structure based on consumption. Running the same procedure as we did for consumption, we obtain a value of 1777 KM per capita per year as a general poverty line. Applying this line to expenditure per capita, we get a poverty incidence of 19.1 percent. This estimate, on a very different basis (i.e., with respect to expenditure rather than consumption) gives a nearly identical value for poverty incidence, suggesting that our prior estimate of poverty is robust even to such a radical change in approach.

6.32 But what about the poverty profile? Are the same households classified as poor using consumption and expenditure, respectively, as welfare indicators? Table 6.1 below shows how the division of the population covered by the LSMS into poor and non-poor using the two different methodologies.

Table 6.1 Population by Poverty Status Measured on the basis of Consumption or Expenditure (Percent).

		Consumption based		
		Non- Poor	Poor	Total
Expenditure Based	Non – Poor	76.68	4.22	80.90
	Poor	4.03	15.07	19.10
	Total	80.71	19.29	100.00

Source: LSMS data 2001, general poverty line, per capita. In average prices. Sampling weights.

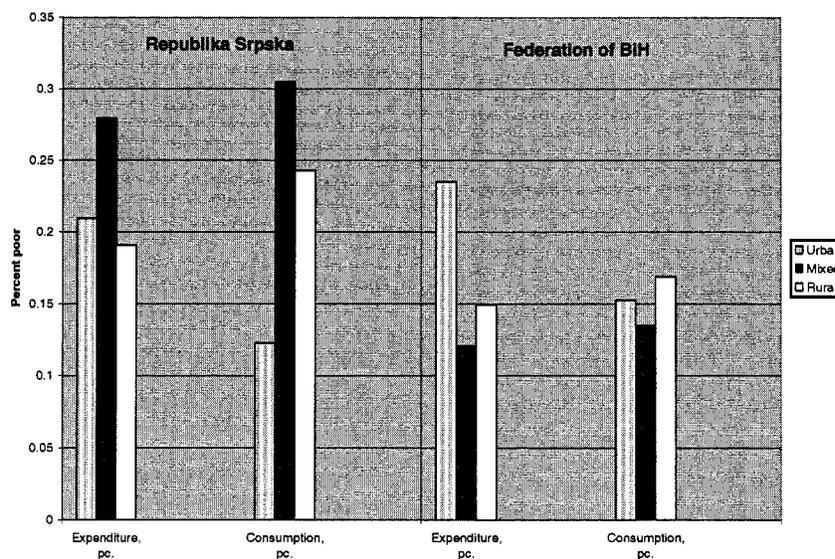
6.33 The Table shows that there is a very significant overlap between the two methodologies: 15.07 percent of the population is classified as poor under both measurement assumptions and only around 1/5 of all the poor are classified differently under the different methodologies.

6.34 We next need to do a robustness check by determining whether key vectors of poverty show substantial variation under the two alternative (expenditure vs. consumption) measurement methodologies, by running a poverty profile using different assumptions. We use the same variables used in the previous sets of robustness checks based on equivalence scales and alternative poverty lines.

(i) Location and Poverty

6.35 Figure 6.15 looks at the poverty profile by type of municipalities, using the two different welfare measures. We would expect to see quite a substantial re-ranking using expenditures as opposed to versus consumption: after all, the key differences between the two are imputed rents, which are clearly higher in urban areas, and the value of own agricultural consumption, which attracts a higher valuation at market price rather than at self-reported values.

Figure 6.15 Poverty by Location Comparing Alternative Definitions of Welfare



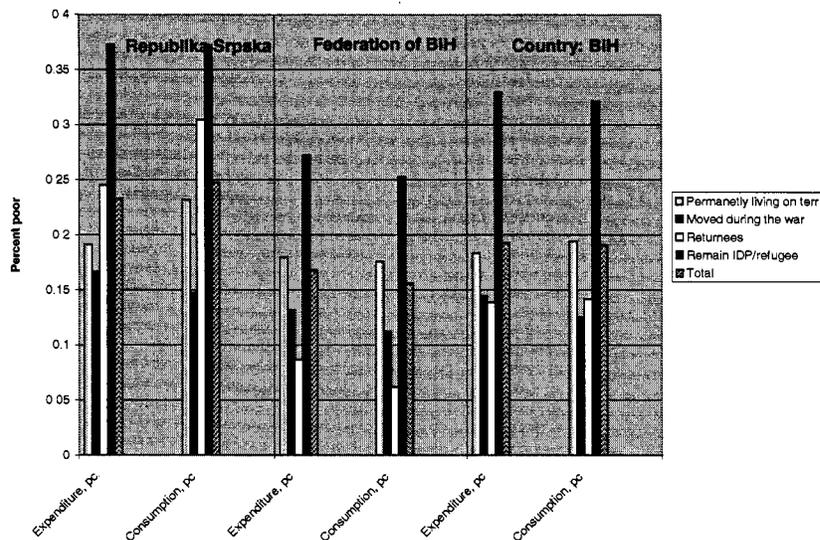
Source: BiH-LSMS 2001. Note: The two panels from left to right show results for RS and FBiH. Each vertical bar represent the level of poverty incidence for a category of municipality (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

6.36 Using an expenditure-based measure does affect the relative position of different types of locality: urban municipalities become poorer, rural areas a little richer. Note, however, that mixed municipalities keep their rank as poorest in RS and least poor in the Federation regardless of the measurement assumption used. Thus the outcomes are reasonably robust to changes in the methodology, in the sense that the poorest and richest areas preserve their rank across methods.

(ii) Poverty by Displacement Status

6.37 Figure 6.16 provides a comparison by displacement status using different measurement methodologies. The conclusion about the poverty of IDPs and refugees and returnees is very robust to the two different methodologies.

Figure 6.16 Poverty by Displacement Status Comparing Alternative Definitions of Welfare

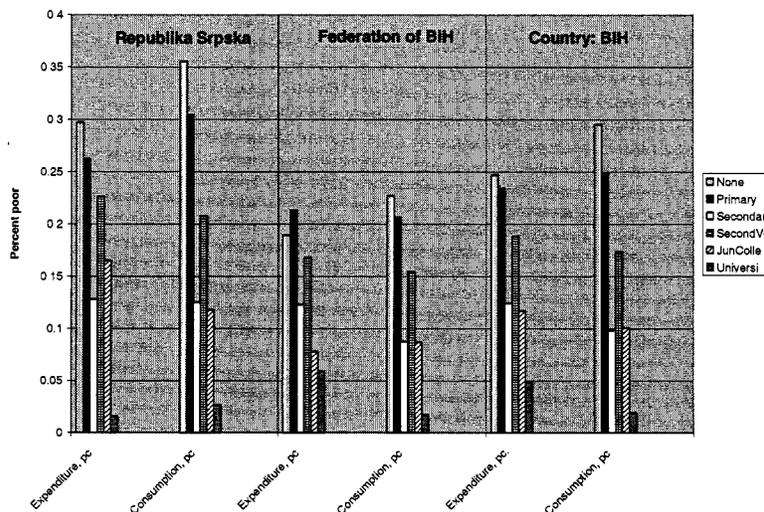


Source: BiH-LSMS 2001. Note: three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represent the level of poverty incidence for a category (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

(iii) Education of the Household Head

6.38 Figure 6.17 shows that the education level of the household head—one of the key determinants of poverty—retains its importance regardless of which welfare measure is used. Using expenditures makes the profile “flatter”, i.e. it reduces the differences between education categories, but the ranking is almost always preserved. Recall that this variable was also remarkably stable with respect to equivalence scale assumptions.

Figure 6.17 Poverty by Household Head’s Level of Education Comparing Alternative Definitions of Welfare



Source: BiH-LSMS 2001. Note: three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represent the level of poverty incidence for a category (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

(iv) Employment Status of Adults

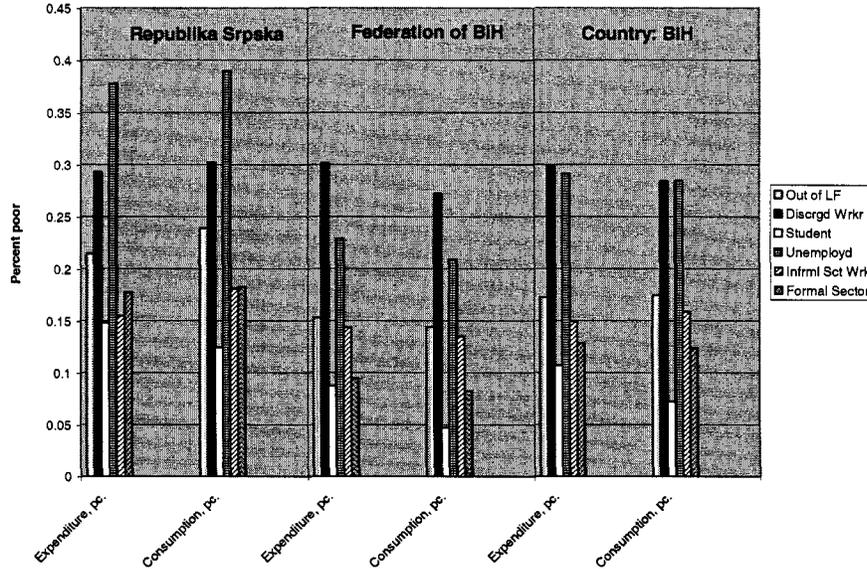
6.39 Figures 6.18 and 6.19 compare the relative incidence of poverty by two definitions of employment status using expenditure- and consumption-based welfare measures.

6.40 The Figures show the robustness of the findings under different welfare measures. The unemployed, however defined, are poorer, and employment clearly reduces poverty incidence. There is also a consistent pattern between the Entities, which is preserved under any measurement methodology.

6.41 Figure 6.18 defines employment status in line with the ILO definition. Figure 6.19 uses the official “registered” or “administrative” classification used in BiH.

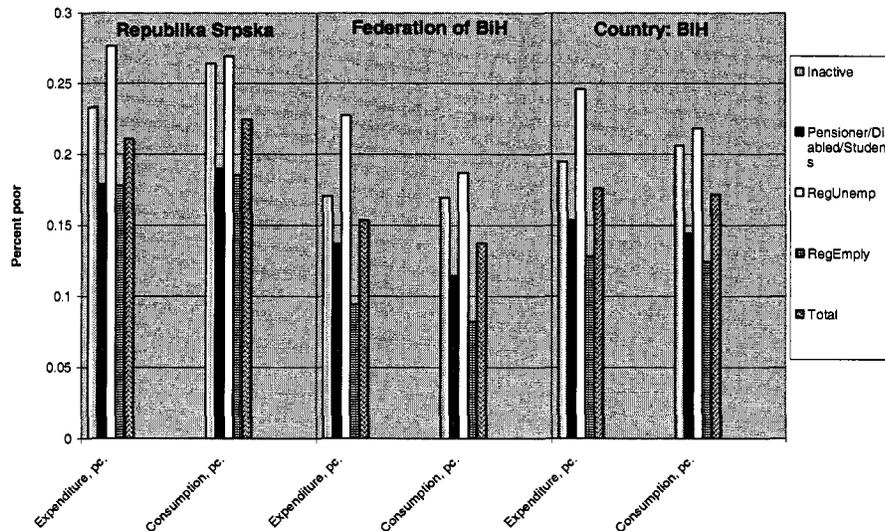
6.42 Comparing Figures 6.18 and 6.19 shows not only the robustness of the poverty profile across methodologies, but also - as in previous comparisons in this chapter - that the ILO (“economic”) definition of unemployment is associated with higher poverty levels than the BiH official (“administrative”) definition.

Figure 6.18 Poverty by Labor Force Status of Adults (ILO definition), Comparing Alternative Definitions of Welfare



Source: BiH-LSMS 2001. Note: three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represent the level of poverty incidence for a category (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

Figure 6.19 Poverty by Registered Employment Status of Adults, Comparing Alternative Definitions of Welfare

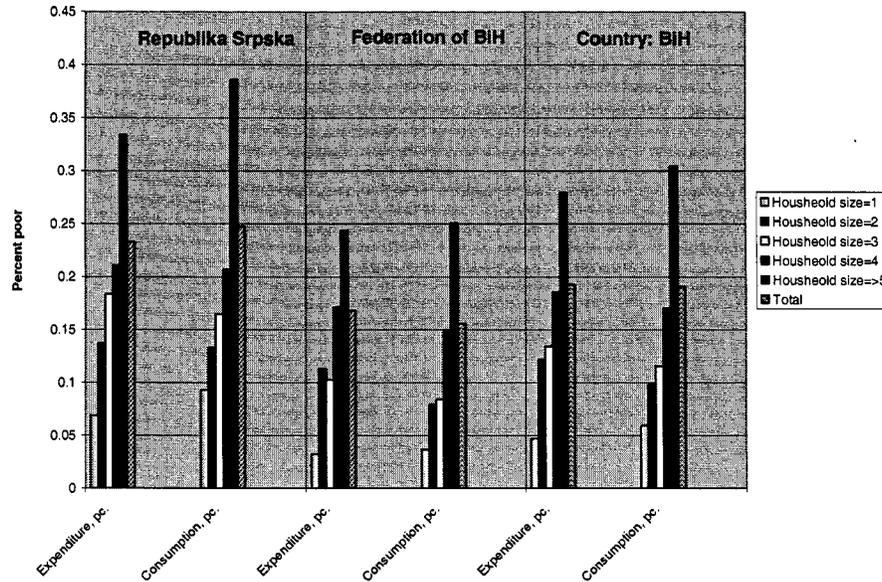


Source: BiH-LSMS 2001. Note: three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represent the level of poverty incidence for a category (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

(v) *Household Size*

6.43 Poverty by household size is the demographic variable that is expected to be most sensitive to economies of scale assumptions. And this is indeed what we find as Figure 6.20 suggests.

Figure 6.20 Poverty by Household Size, Comparing Alternative Definitions of Welfare



Source: BiH-LSMS 2001. Note: three panels from left to right show results for RS, FBiH and BiH. Each vertical bar represent the level of poverty incidence for a category (see legend on the right). The horizontal axis lists a set of methodologies used to measure poverty is listed: consumption for expenditure. Comparing height of bars inside each panel, we test whether poverty risk are robust to measurement assumptions.

6.44 Finally, Figure 6.20 also shows that the poverty profile by household size is robust to the two different welfare measures. The profile has a very clear stepwise shape for both expenditure and consumption: larger households are poorer than smaller ones.

D. Conclusions

6.45 The BiH-LSMS allows us to study the poverty profile in BiH in significant detail. As discussed in earlier chapters, the methodology chosen uses most of the best practice approaches to poverty measurement. It is based on using a comprehensive consumption measure as the welfare indicator, and on using survey-generated prices to value the poverty basket. The robustness analysis is summarized in Table 6.2. Table lists key correlates of poverty reviewed in the pervious sections in rows. Columns represent baseline definition of poverty (first column) and its variations in terms of scale economies, poverty line sand definition of well being. Cells in Table 6.2 say “yes” when a listed characteristic is strongly associated with poverty under a given measurement assumption, and “no” when such association is only weak or reverse (the characteristic is associated with lower poverty rate). Robustness can be assessed by comparing across columns: is the same characteristic is listed consistently as “yes” or “no”, it is a robust

correlate of poverty (“yes”), or wealth (“no”). If there is a switch between “yes” and “no”, the characteristic is not robustly associated with poverty under the tested measurement assumptions.

Table 6.2 Key characteristics of poverty and its robustness to measurement assumptions.

Characteristics of poverty	Baseline, consumption per capita	OECD I scale	OECD II scale	Higher poverty line	Lower poverty line	Expenditure per capita
Mixed (semi-urban) municipalities in RS	yes	yes	yes	yes	yes	yes
Rural municipalities in FBiH	yes	yes	no	no	yes	no
IDPs and Refugees	yes	yes	yes	yes	yes	yes
Households headed by persons with low education (primary or less)	yes	yes	yes	yes	yes	yes
Households headed by persons with education above secondary	no	no	no	no	no	no
Unemployed (ILO) and inactive adults	yes	yes	yes	yes	yes	yes
Employed according to registration	no	no	no	no	no	no
Registered unemployed	yes	yes	yes	yes	yes	yes
Household headed by elderly	no	no	no	no	no	no
Larger households	yes	yes	no	yes	yes	yes

Source: Staff estimates based on BiH-LSMS 2001.

6.46 This chapter has shown that the poverty profile by *economic characteristics* thus derived is robust to three kinds of alternative measures – different equivalence scales (a per capita scale versus OECD measures that incorporate economies of scale: Section A); higher or lower poverty lines (section B); and using expenditure instead of consumption as the welfare measure (Section C).

7. FROM FEATURES OF POVERTY TO ITS CAUSES

7.1 Having discussed constructed a poverty profile for BiH and having determined that the profile was robust to alternative assumptions and measures, we can now move a step further and discuss the causes of poverty.

7.2 Identifying the key characteristics of the poor is an important first step in designing effective social policy to reduce poverty among currently poor households and individuals, and to prevent others from becoming poor. Since poverty in BiH is a multi-faceted phenomenon, involving the interaction of many characteristics, it is important to try to isolate the impact of each factor, controlling for the impact of others. Such a statistical decomposition is also necessary given the degree of imprecision of simple cross tabulations. Finally, this type of analysis is helpful for predicting the poverty impact of a particular Government program. To analyze the importance of each factor in determining the poverty status of a household we conducted a multivariate analysis of poverty risk.

7.3 Figure 7.1 summarizes the rationale for this approach. The poverty profile shows simple correlations between household characteristics and poverty. For example we learned that the unemployed are more likely to be poor than the employed, indicating a correlation between poverty and unemployment. At the same time, we also know that poverty is correlated with low education: those with primary education or less have a high incidence of poverty. But these two factors – unemployment and education - are not independent from one another. What is the true (“net” or “partial” as economists call it) link between employment and poverty: are the unemployed poor purely because they are without work, or also because they have low education? If the latter is true, then even if poorly educated individuals find work, they are likely to get low paying jobs, so that their risk of being poor remains. If the partial correlation between unemployment and poverty is much smaller than the corresponding simple correlation, this would imply that much of the relationship between unemployment and poverty can be accounted for by lower education, and not by the lack of employment per se.

7.4 This may seem evident in the particular case of education and employment: we know that limited education often means low productivity and low earnings, so that employment alone may not “solve” poverty problem for this group. The value added in multivariate analysis is that it can estimate the magnitude of these effects, and can be used to estimate not just three, but multiple links and correlations at the same time. It helps to provide insights about which policies will have the highest impact on poverty. In addition, we can simulate the impact on policy of a particular intervention - for example, if the unemployed are helped to get work, by how much will their poverty risk fall?

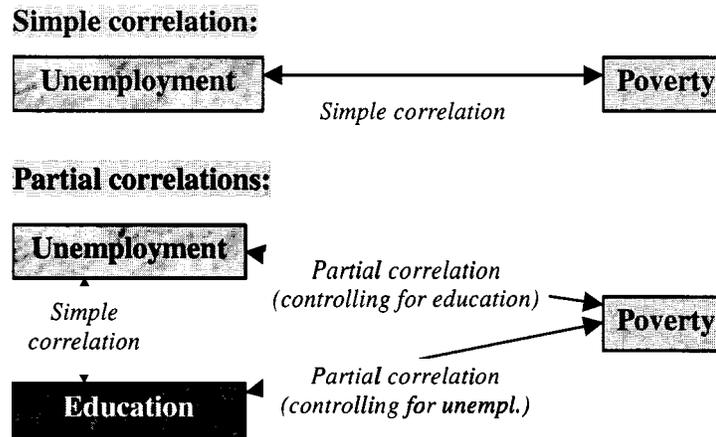


Figure 7.1 Simple versus partial correlation in poverty analysis.

7.5 There is no straightforward way to estimate these partial effects using micro data. For the purpose of this analysis, we have adopted a two-step approach that yields easy-to-interpret results and that uses all available information on the relationship between household characteristics and consumption. First, we estimate the relation between per capita consumption and key sets of household characteristics using an OLS regression:

$$\ln(eqcons_i) = \alpha_0 + \alpha_1 educ_i + \alpha_2 lfpart_i + \alpha_3 region_i + \alpha_4 dependency_i + \alpha_5 size_i + \alpha_6 vuln_i + \epsilon_i$$

where $eqcons_i$ denotes (depending on the specification) per capita or per equivalent adult basis. we calculate of individual i , $educ_i$ denotes a set of dummies for own education and education of the household head, $lfpart_i$ is a measure of labor force participation of a household and individual labor market status, $region_i$ denotes a set of regional dummy variables, $dependency_i$ consists of 2 control variables for dependency of children and the elderly, $size_i$ are control variables for household size, and $vuln_i$ are control variables for specific factors of vulnerability (displacement status and disability in a household). The error term is denoted by ϵ_i and the α_s are vectors of coefficients to be estimated. The estimates are reported in Table 7.1.

7.6 The second step is to use this regression to simulate per capita consumption holding one of these key characteristics constant across the population and calculate the relative poverty risks using this simulated measure of per capita or adult equivalent consumption. For example, if the regression indicates that, holding other factors constant, having a university education is associated with a 16% increase in per capita consumption (compared to the average), we create the simulated consumption measure corrected for education by subtracting 16% from the consumption of those with university education (and similarly for other educational categories). Next, we predict the poverty risk for each household in the dataset (depending on its particular configuration of characteristics other than education) based on this simulated consumption, and we tabulate the relative poverty risk by education. The resulting relative poverty rates are purged from any effect running through education, and they therefore show a partial relationship.

Table 7.1 Regression of Log Consumption on Household Characteristics

	<i>Dependent variable: Log household consumption per capita</i>		<i>Dependent variable: Log household consumption per equivalent adult</i>	
	Coefficient	Standard error	Coefficient	Standard error
<i>1a) Own education</i>				
Unfinished primary, or continuing education	[omitted]			
Primary	-0.001	0.013	-0.001	0.013
Vocational Secondary	0.065	0.016	0.077	0.019
General Secondary	0.076	0.018	0.065	0.016
Post Secondary	0.153	0.024	0.154	0.025
<i>1b) Own employment</i>				
Inactive, not capable or unwilling	0.002	0.014	0.002	0.014
Discouraged worker	-0.085	0.025	-0.085	0.025
Student	[omitted]			
Unemployed	-0.075	0.025	-0.075	0.025
Informal sector worker	-0.077	0.027	-0.077	0.027
Formal sector worker	-0.039	0.014	-0.039	0.014
<i>2) Education of HH head</i>				
Unfinished primary	-0.392	0.050	-0.391	0.050
Primary	-0.186	0.033	-0.185	0.033
Vocational Secondary	[omitted]			
General Secondary	-0.104	0.028	-0.104	0.028
Post Secondary	0.159	0.041	0.159	0.041
<i>3) Labor force participation</i>				
# of employed /# of adults	0.345	0.046	0.345	0.045
<i>4) Location</i>				
RS	-0.106	0.036	-0.106	0.036
FbiH	[omitted]			
Urban	[omitted]			
Mixed	-0.054	0.034	-0.054	0.034
Rural	0.104	0.033	0.104	0.033
<i>5) Displacement status</i>				
Have not moved during the war				
Moved during the war	0.004	0.019	0.004	0.019
Returnees	0.054	0.040	0.054	0.040
Remain IDP/Refugee	-0.119	0.032	-0.120	0.032
<i>6) Dependency ratios</i>				
# of small child/household size	-0.498	0.080	-0.220	0.080
# of school age children/hhd size	-0.443	0.064	-0.166	0.064
# of elderly/household size	-0.085	0.043	-0.084	0.043
Disabled is present in a household	-0.005	0.026	-0.005	0.026
<i>7) Gender of household head</i>				
Female	0.087	0.023	0.086	0.023
<i>8) Household size</i>				
Effect of 2 nd member	-0.310	0.041	-0.148	0.041
Additional effect of 3 rd member	-0.482	0.047	-0.261	0.047
Additional effect of 4 th member	-0.598	0.048	-0.344	0.048
Additional effect of 5 th member	-0.665	0.055	-0.391	0.055
Additional effect of 6 th , 7 th , 8 th etc. member	-0.769	0.053	-0.474	0.053
R ²	0.3503		0.2689	
Number of observations	16967		16967	

Notes. Robust standard errors are adjusted for clustering on household id. Source: 2001 LSMS Survey.; per equivalent adult uses the OECD scale

7.7 Based on the regression using the log of per capita consumption as the dependent variable, the coefficients of the regression can be interpreted as partial effects measured in percentage terms. For example, the coefficient for RS in the section of Table 7.1 covering “location” is -.106. This therefore means that, holding all other variables constant, someone who lives in RS on average has 10.6% less consumption than a similar person in FbiH. We report here only results from a pooled

regression both data from RS and FBiH, where location is controlled for. Note that running two separate regressions and then applying a Chow test on the equality of coefficients does yield negative results: the coefficients are statistically different. This, however, does not imply qualitatively different results about the determination of welfare in the two Entities. On closer inspection almost all the coefficients look alike, with only two notable exceptions: returnees and semi-urban municipalities in RS have significantly lower consumption than similar groups in FBiH, other factors being controlled for.

7.8 **Education** turns out to be the strongest predictor of consumption, and therefore of poverty. For example, holding all other variables constant, households with a head with post secondary education on average consume 15.9% more than those with a head with secondary education, and more than 55% more (15.9% $-(-39.2\%)$) than those with a head with an unfinished primary education. The regression includes both own education and the household head's education because both matter empirically.

7.9 Households with higher **labor force participation** have significantly higher consumption levels. **Rural** areas have significantly higher consumption per capita than urban areas, other things being equal. Finally, holding other variables constant, **larger families** have lower levels of consumption.

7.10 Surprisingly, this result is also true controlling for economies of scale, as the two right-hand columns of Table 7.1 demonstrate. Applying the per adult equivalent scale produces the same result as the per capita scale even for the effects of household size: controlling for other characteristics, larger households tend to have lower equivalent consumption than smaller ones.

7.11 Table 7.2 reports the poverty correlations in two ways. First, it shows observed poverty rates (in percentage points) by demographic subgroup, (measured as the poverty rate for that subgroup minus the overall poverty rate). Hence, a subgroup with an average poverty rate has an excess risk of 0 percentage points, but one with a rate of 25 percent as opposed to the 19 percent average rate is 6 percentage points more likely to be poor than average, while a subgroup with a poverty rate of 5 percent is 14 percentage points less likely to be poor than average.

7.12 Second, Table 7.2 shows the partial effect of a characteristic on poverty—in other words, if all other factors included in the analysis are controlled for, or remain unchanged, the percentage shown in this column measures the effect of a characteristic on an above or below-average poverty rate. The table uses our baseline poverty measurement assumptions (per capita consumption and the “general” poverty line calculated in Chapter IV). For comparative purposes, it also provides partial risk data on a per adult equivalent basis for BiH only.

7.13 We find that all the above or below-average (positive and negative) percentages work in the expected direction. Thus, the “partial risk” column for BiH shows that an additional dependant (be it a child, an elderly person or an adult) in a household generally increases the household's chances of being poor, other factors being controlled for. Also as expected, an additional employed person in a household decreases the household's poverty risk.

7.14 Note that “net” risks for education remain almost as big as the simple (observed) risk presented in column 1 and dominate other factors: when the household head (usually its only

breadwinner in BiH) completes post secondary education, the poverty risk of the household is reduced by 25 percentage points compared to a household headed by a person with unfinished primary education, or by 40 percent compared to a base household.

Table 7.2 Household Characteristics, Simple and Simulated Poverty Risks for Per Capita Scale

	Observed	Partial risk BiH	Memo: partial for Equivalent adult, BiH	Partial risk RS	Partial Risk FBiH
<i>1a) Own education (compared to unfinished primary)</i>					
Primary	-1%p.p	+0%p.p	+0%p.p	+0%p.p	+0%p.p
Vocational Secondary	-8%p.p	-4%p.p	-4%p.p	-2%p.p	-5%p.p
General Secondary	-12%p.p	-4%p.p	-4%p.p	-1%p.p	-5%p.p
Post Secondary	-21%p.p	-4%p.p	-5%p.p	-3%p.p	-4%p.p
<i>1b) Own employment(compared to student)</i>					
Inactive, not capable or unwilling	+10%p.p	-0%p.p	-0%p.p	+1%p.p	-0%p.p
Discouraged worker	+21%p.p	+6%p.p	+6%p.p	+2%p.p	+8%p.p
Unemployed	+21%p.p	+5%p.p	+5%p.p	+8%p.p	+2%p.p
Informal sector worker	+9%p.p	+4%p.p	+4%p.p	+1%p.p	+6%p.p
Formal sector worker	+5%p.p	+2%p.p	+2%p.p	+1%p.p	+2%p.p
<i>2) Education of HH head(compared to vocational)</i>					
Unfinished primary	+20%p.p	+21%p.p	+26%p.p	+26%p.p	+17%p.p
Primary	+15%p.p	+11%p.p	+12%p.p	+14%p.p	+10%p.p
General Secondary	+8%p.p	+6%p.p	+6%p.p	+5%p.p	+6%p.p
Post Secondary	-8%p.p	-4%p.p	-4%p.p	-8%p.p	-3%p.p
<i>3) Labor force participation(compared to no one)</i>					
Effect of 1 st worker	-8%p.p	-7%p.p	-9%p.p	-9%p.p	-6%p.p
Additional effect of 2 nd worker	-2%p.p	-5%p.p	-6%p.p	-5%p.p	-5%p.p
<i>4) Location (compared to urban in FBiH)</i>					
RS	+9%p.p	+7%p.p	+7%p.p		
Mixed	+8%p.p	+4%p.p	+4%p.p	+9%p.p	+1%p.p
Rural	+5%p.p	-7%p.p	-7%p.p	-1%p.p	-10%p.p
<i>5)Displacement status (compared to " domestic")</i>					
Moved during the war	-7%p.p	-0%p.p	-0%p.p	+3%p.p	-1%p.p
Returnees	-5%p.p	-3%p.p	-3%p.p	+4%p.p	-5%p.p
Remain IDP/Refugee	+13%p.p	+8%p.p	+9%p.p	+15%p.p	+2%p.p
<i>6) Dependency ratios(compared to no dependants)</i>					
Effect of 1 st small child	+7%p.p	+6%p.p	+3%p.p	+11%p.p	+4%p.p
Additional effect of 2 nd small child	+3%p.p	+6%p.p	+5%p.p	+11%p.p	+5%p.p
Effect of 1 st school age child	+3%p.p	+5%p.p	+2%p.p	+5%p.p	+5%p.p
Additional effect of 2 nd child	+10%p.p	+4%p.p	+3%p.p	+5%p.p	+3%p.p
Effect of 1 st elderly	-0%p.p	+3%p.p	+3%p.p	+3%p.p	+3%p.p
Additional effect of 2 nd	+3%p.p	+2%p.p	+3%p.p	+2%p.p	+2%p.p
<i>7) Gender of household head (compared to male)</i>					
Female	-8%p.p	-5%p.p	-5%p.p	-6%p.p	-3%p.p
<i>8) Household size (compared to single person)</i>					
Effect of 2 nd member	+4%p.p	+7%p.p	+6%p.p	+10%p.p	+5%p.p
Additional effect of 3 rd member	+2%p.p	+5%p.p	+10%p.p	+5%p.p	+4%p.p
Additional effect of 4 th member	+5%p.p	+6%p.p	+13%p.p	+7%p.p	+6%p.p
Additional effect of 5 th member	+7%p.p	+9%p.p	+19%p.p	+6%p.p	+9%p.p
Additional effect of 6 th , 7 th , 8 th etc. member	+12%p.p	+12%p.p	+28%p.p	+17%p.p	+9%p.p

Source: estimates based on regression results reported in Table A1.

7.15 The interpretation of the results for own education is not straightforward, as in this regression we control for the level of household consumption per capita (or equivalent adult), i.e. forcing all individual consumption level to be equal within each household regardless of the education level of each member. This may in fact explain the flat profile of partial risks for own education. Note also that the poverty risks associated with pre-school age children are clearly elevated, especially in RS.

7.16 Two key findings emerge from the simulations described in this chapter. First, the strongest determinant of poverty in BiH is education. Thus, successful poverty reduction requires paying special attention to long-term efforts to improve the access of the poor to educational opportunities. That having been said, however, the second critical conclusion to be drawn from the simulations is that they confirm the now widely accepted notion that there is no single root cause of poverty. Rather, what makes people poor in BiH is a combination of misfortunes. This clearly signals the need for a multifaceted strategy to fight poverty.

Annex 1. Tests for Economies of Scale in Household Consumption

To determine an appropriate equivalence scale for households in BiH, we start with the equation:

$$EA=(A+\alpha K)^\theta$$

discussed in Section II.C. (iii) above. By comparing the results using a reasonable range of values for the two parameters we test the robustness of the data. Some commonly used scales do not fall in the category of equivalence scales described by that formula, however. The OECD 1 formulation, for example, has used the following equivalence scale:

$$\text{Equivalent size} = 1 (\text{first adult}) + (0.7 * \text{additional adults}) + (0.5 * \text{children})$$

Different methods are used to set equivalence scales, but each has drawbacks. As a result, a wide variety of equivalence scales is used in various countries.

Estimates using Engel's Method : The crucial assumption of the Engel method is that there is an inverse and monotonic relationship between a household's well-being and the share of expenditure spent on food. Hence, this assumption implies that two households are equally well-off if and only if the food share in their expenditure is equal. This assumption is questionable, and consequently, experts have advised against using this method.¹⁹ Hence, any estimates by this method should not be taken as definitive, but rather as one piece of information that can aid in the selection of an equivalence scale.

We estimate a semi-log formulation for Engel's relationship using non-linear least squares:

$$\text{FoodShare}_i = \beta_0 + \beta_1 \ln \left(\frac{\text{Expenditure}_i}{(\text{Adults}_i + \alpha \text{Children}_i)^\theta} \right) + \varepsilon_i,$$

where Foodshare_i is the foodshare of household i , Expenditure_i is its total household consumption expenditure, and Adults_i and Children_i are the number of adults and children in the household. The error term is denoted by ε_i while β_0 , β_1 , α and θ are parameters to be estimated.

This equation is estimated using non-linear least squares for the full sample of households in the LSMS as well as separately for both Entities. The estimates are shown in Table A-1.²⁰

The estimates for BiH as a whole and both entities are quite consistent. The magnitude and sign of all coefficients also fit expectations: beta 0 is positive and beta 1 is negative. The value of the intercept (close to one) is also what one would expect, since the poorest families will spend everything on food. However, the explanatory power of the regression is very weak, indicating significant "noise" in the data, which makes it difficult to calibrate the exact relationship.

¹⁹ See Deaton, Angus, 1997, *The Analysis of Household Surveys: A Microeconomic Approach to Development Policy*, Baltimore, MD: Johns Hopkins University Press.

²⁰ We also regressed the food share on a quadratic polynomial in equivalent household expenditure. Adding the quadratic term hardly improved the fit and yielded essentially the same estimates for α and θ .

Results for the RS are particularly “noisy”, with the point estimate of θ being 1.84, but the 90% confidence interval comprises 1. The point estimates of α in the Entity samples are strikingly different indicating that children require somewhat less resources than adults in RS, but more than adults in the FbiH. Other things being equal, the “cost” of a child in FbiH is double that in the RS. This effect is so large as to drive the cost of children above that of adults for the entire country. But in both estimates the standard errors large enough to make it impossible to reject the null hypothesis that both θ and α are equal to one. This supports what the estimate using the whole sample suggests: a simplest linear per capita equivalence scale is our preferred estimate.

Table A-1 Estimates for Equivalence Scale Using Engel’s Method

	BiH (whole sample)	RS	FBiH
α	.768 (.029450)	.326 (.0528318)	1.433 (.0590385)
θ	.986 (.019808)	1.841 (.1779523)	.862 (.0207698)
β_0	1.080 (.0314201)	.730 (.0430747)	1.053 (.0380474)
β_1	-.083 (.0037963)	-.039 (.005211)	-.083 (.0045443)
Adjusted R ²	0.0878	0.0413	0.1087
No. of Observations	5189	2294	2895

Source: BiH LSMS (2001). Note: Standard errors in parentheses

The estimates in the previous table tell us the preferred equivalence scales for Engel methodology, but as we saw, the confidence intervals were relatively large. Hence, other equivalence scales may also be consistent with the Engel assumption. The extent to which an equivalence scale is consistent with the Engel assumption can be tested by running the following auxiliary regression:

$$FoodShare_i = \beta_0 + \beta_1 \ln\left(\frac{Consumption_i}{EqScale_{k,i}}\right) + \gamma \ln(Size_i) + \delta \frac{Kids_i}{Size_i} + \varepsilon_i$$

where $EqScale_{k,i}$ is the equivalent size of household i using equivalence scale k , $Size_i$ is the number of members of household i and the other variables are as defined above. If equivalence scale k is correct (and the Engel assumption holds), then the food share should be fully explained by equivalent consumption. In this case, the coefficient on household size (γ) and the coefficient on the share of children in the household (δ) should both be indistinguishable from zero in a statistical sense. This is implemented by performing an F-test on the joint hypothesis that $\gamma=0$ and $\delta=0$. The result of this test is a p-value indicating the likelihood of obtaining the current estimates if the true value of γ and δ are zero. A higher p-value for equivalence scale k indicates that equivalence scale k is more consistent with the Engel assumption (or a different assumption, such as subjective welfare data).

Such tests were carried out using BiH-LSMS data. The p-values of these tests for a number of equivalence scales are reported in Table A-2. Unfortunately the results were rather discouraging, as the table below illustrates.

Table A-2 Tests of Equivalence Scales

Equivalence Scale	Engel Methodology			
	α	θ	P-value on test of $\gamma = 0$ and $\delta = 0$	
			RS (n=2294)	FBiH (n=2895)
Engel (whole sample)	0.8	1.0	0.0607	0.2540
OECD-I (current)	0.5	0.84*	0.0003	0.0741
ECA poverty	1.00	0.75	0.0002	0.1879
Per Capita (PC)	1.00	1.00	0.0007	0.4261
Luxembourg Income Study (LIS)	1.00	0.50	0.0003	0.0022

Source: BiH LSMS (2001). Note: The equivalence scales are defined above. The LIS scale is the square root of the household size.

The test statistics shown in Table A-2 do not accept *any* of the five equivalence scales when we define acceptance at p-values above .90 (for both RS and FBiH). Therefore we do not have, a scientific basis for selecting one equivalence scale over another.

Annex 2. Food Poverty Line: Detailed Nutritional Assessment

The method for constructing a food poverty line described in Chapter IV is focused on a certain target value of caloric intake, which is set at 2100 KCal per day per capita. However, the composition of the basket obtained in this way may be such that several key nutrient requirements are not properly met. We thus did a further analysis to check the results against more detailed set of nutritional requirements, in addition to calories.

First, to determine the caloric and nutritional needs of an average person in BiH, we divided the population (using the BiH - LSMS data) into 18 different demographic groups. Then, using the key nutritional norms by demographic group recommended by the World Health Organization (WHO) and the Food and Agricultural Organization (FAO), and the share of each demographic group in the population, the minimal amounts by nutrient needed for an average person in BiH were calculated (see Table B-1). For example, given the demographic composition of the population in BiH, the minimum food basket is 2239 KCal, as was assumed in the basic derivation.

Table B-1 Derivation of Minimum Food Requirements for BiH

Sex and Age	Energy (kcal)	Protein (g)	Fat Min (g)	Fat Max (g)	Iron (mg)	Iodine (µg)	Vitamin A (µg retinal)	Ribo- flavin (mg)	Niacin (mg)	Folate a,b (µg)	Vitamin C (mg)	Thiam- ine (mg)	Demo- graphic shares %	
Boys	below 1 yr	950	14		11	50	350	0.5	5.4	32	20	0.2	2.73	
Boys	1-3 years	1350	22	23	52	7	70	400	0.8	9	50	20	0.3	3.65
Boys	3-5 years	1600	26	27	62	7	90	400	1	10.5	50	20	0.5	3.26
Boys	5-7 years	1820	30	30	71	10	90	400	1.1	12.1	76	20	0.6	3.98
Boys	7-10 years	1900	34	32	74	12	120	400	1.3	14.5	102	20	0.9	4.21
Boys	10-12 years	2120	48	35	82	12	150	500	1.6	17.2	102	20	1.2	2.36
Boys	12-14 years	2250	59	38	88	18	150	600	1.7	19.1	170	30	1.2	1.89
Boys	14-16 years	2650	70	44	103	18	150	600	1.8	19.7	170	30	1.2	1.53
Boys	16-18 years	2770	81	46	108	11	150	600	1.8	20.3	200	30	1.2	1.64
Girls	10-12 years	1905	49	32	74	11	150	500	1.4	15.5	102	20	0.9	1.92
Girls	12-14 years	1955	59	33	76	20	150	600	1.5	16.4	170	30	1	1.85
Girls	14-16 years	2030	64	34	79	20	150	550	1.5	15.8	170	30	1	1.68
Girls	16-18 years	2060	63	34	80	24	150	500	1.4	15.2	170	30	1	1.64
Male	18-60 years	2895	55	48	113	11	150	600	1.8	19.8	200	30	1.2	26.47
Male	>60 years	2020	55	34	79	11	150	600	1.8	19.8	200	30	1.2	6.72
Female	Not pregnant or lactating	2210	49	37	86	13	150	500	1.3	14.5	170	30	1.1	24.53
Female	>60 years	1835	49	31	71	9	150	500	1.3	14.5	170	30	1.1	8.36
Female	Lactating	2710	69	45	105	38	200	850	1.7	18.2	270	30	1.4	1.59
Average BiH		2239	48.9	36.9	86.19	12.27	139.5	527.3	1.4	16.0	160.4	27.7	1.0	100%

Source: For energy figures: : FAO, 1990b. For protein figures: WHO, 1985. For iron figures: FAO, 1988. For iodine, vitamin A and folate figures: FAO, 1988. For riboflavin, niacin and vitamin C figures: FAO, 1982 Food and Nutrition Series - No. 29

Given that caloric needs will not be met with a baseline basket, it is legitimate to ask whether the food poverty line expressed in monetary terms of KM 760 derived from it is adequate. This is highlighted by analysis of the nutritional value of such a basket reported in Table B-2. A linear

optimization program was applied to find a composition of the food basket that could be achieved at the total cost equal to the one obtained in the baseline approach given BiH prices and the key nutritional requirements for an average citizen. Table B-2 compares the constructed basket to the primary baseline obtained by a simple arithmetical rule; it is clear a basket which meets nutritional standards.

Table B-2 Nutritional Assessment of Minimum Baskets

Nutrition Item	Unit of Measurement	Initial Minimum Food basket	Percent of Requirement	Optimized Minimum Food Basket	Percent of Requirement
Energy	Kilocalorie	2100	95	2240	100
Protein	Gram	56	115	65	134
Fat (maximum safe intake)	Gram	76	205	61	71
Iron	milligram	9	70	12	101
Vitamin A	μg retinol	437	83	528	100
Vitamin C	milligram	44	159	73	262
Thiamine	milligram	1	113	1.3	126
Riboflavin	milligram	1	58	1.09	75
Niacin	milligram	9	58	13	78
Folate	(μg)	138	86	263	164

Source: Calculations based on food requirements (FAO/WHO) and demographic composition of households in BiH from the BiH LSMS.

To avoid unrealistic solutions in this linear programming exercise (in other words, to avoid constructing a diet, that while nutritionally sound, is contrary to the consumption patterns of the population), the actual reference group values of consumption for most food items were taken as lower bounds. The final composition of this optimized food basket that meets nutritional standards is shown in Table B-2. Thus our simplest method yields a total cost that, as best we can ascertain, can purchase a basket at BiH prices which meet strict nutritional tests.

It should be emphasized that nutritional data here are only used as a tool to help construct the general poverty line. Nutritional status is not itself the welfare indicator. One should not be surprised to find that someone living at the poverty line does not reach the nutritional requirement. The human body requires an absolute minimum food-energy intake to maintain bodily functions at rest. These needs must take precedence over all else if one is to survive for more than a relatively short period. Beyond that, food-energy intakes will determine what activity levels can be sustained biologically; the greater the intake, the greater the energy expenditure available, i.e., the greater one's potential activity level. Setting the food component of a poverty line is thus a matter of a normative judgment about what activity levels should be attainable. What is important is that the method chosen provides a total estimate that has an adequate nutritional value; its specific composition is much less important issue.

Table B-3 Actual Reference and Minimum Food Basket, Per Person, Kg/Lt/KM/ Month

Code	Product	Unit	INITIAL MINIMUM Basket	Optimised MIN BASKET	KCAL Composition	Price, KM	Cost, KM/Month
01	Rice	KG	0.214	0.154	0.8%	1.63	0.25
02	Other cereals (maize, wheat, rye, barley,	KG	0.930	1.230	6.2%	1.40	1.72
03	Wheat flour (all types)	KG	4.950	5.002	23.8%	0.64	3.20
04	Other types of flour (maize, rye, etc.)	KG	0.270	0.304	1.6%	1.13	0.34
05	Bread	KG	3.625	5.932	22.7%	0.87	5.16
06	Pasta	KG	0.355	0.427	2.1%	1.94	0.83
07	Biscuits, pastries, pizza, etc	KG	0.100	0.100	0.5%	4.84	0.48
8/10	Beef, baby-beef, veal	KG	0.410	1.569	2.3%	7.00	10.99
11	Poultry (fresh, chilled, frozen)	KG	0.483	0.820	1.1%	4.77	3.91
12	Other products of animal origin	KG	0.050	0.050	0.2%	6.73	0.34
13.	Fresh water and sea fish (fresh, chilled,	KG	0.146	0.163	0.1%	5.46	0.89
14.	Other fish-based products	KG	0.050	0.050	0.0%	6.50	0.33
15.	Fresh milk	LT	3.825	4.884	4.4%	1.00	4.88
16.	Yogurt, sour milk, kefir	LT	0.771	0.771	0.7%	1.38	1.06
17.	Sour cream	LT	0.227	0.227	0.7%	3.97	0.90
18.	Cream cheese	KG	0.287	0.299	1.5%	2.63	0.79
19.	White cheese	KG	0.226	0.185	1.0%	5.75	1.06
20.	Eggs	KG	0.240	0.247	0.3%	5.00	1.24
21.	Butter	KG	0.090	0.090	1.0%	5.77	0.52
22.	Margarine, melt. Butter	KG	0.099	0.100	1.1%	4.00	0.40
23.	Edible oil	LT	0.700	0.500	6.5%	1.64	0.82
24.	Other animal origin fat	KG	0.317	0.318	4.2%	2.43	0.77
25	Sugar	KG	0.771	0.546	3.2%	1.05	0.57
26	Jam, marmalade, preserves, jelly,	KG	0.141	0.352	1.2%	3.12	1.10
30	Other confect.(ice-cream..)		0.050	0.339	2.1%	7.71	2.61
32	Vinegar	LT	0.077	0.092	0.4%	1.59	0.15
33	Salt	KG	0.180	0.247	0.0%	0.89	0.22
36	Coffee	KG	0.163	0.177	0.0%	7.32	1.29
41	Fruit syrups, juices	LT	0.291	0.291	0.5%	1.98	0.58
44	Beer	LT	0.827	0.900	0.5%	1.23	1.11
45	Fresh citrus fruit	KG	0.141	0.146	0.1%	1.92	0.28
46	Banana	KG	0.150	0.150	0.1%	1.71	0.26
47	Apple	KG	0.294	0.212	0.2%	1.37	0.29
48	Pear	KG	0.116	0.081	0.0%	1.81	0.15
49	Grape	KG	0.104	0.075	0.0%	2.19	0.16
50	Stone fruit (peach, apricot,...)	KG	0.090	0.090	0.0%	1.46	0.13
51	Other fruit (strawberry, raspberry, melon)	KG	0.188	0.225	0.1%	0.93	0.21
52	Nuts, almonds..	KG	0.000	0.000	0.0%	7.40	0.00
53	Dry fruit	KG	0.047	0.826	4.9%	3.00	2.48
54	Fresh leaf vegetable	KG	0.099	0.099	0.0%	1.64	0.16
55	Cabbage-like vegetable	KG	0.490	2.906	0.6%	0.69	2.00
56	Tomato	KG	0.333	0.253	0.1%	1.51	0.38
57	Green pepper	KG	0.263	0.382	0.1%	1.65	0.63
58	Cucumber, kg	KG	0.208	0.150	0.0%	1.12	0.17
59	Peas, green beans, kg	KG	0.064	0.539	0.3%	1.96	1.06
60	Dried beans, kg	KG	0.188	0.282	0.1%	3.00	0.85
61	Carrot, kg	KG	0.090	0.097	0.0%	1.25	0.12
62	Onions, kg	KG	0.218	0.245	0.1%	1.08	0.26
63	Garlic, kg	KG	0.090	0.124	0.0%	2.80	0.35
64	Potatoes, kg	KG	2.356	1.649	1.7%	0.59	0.97
65	Other types of fresh vegetable	KG	0.043	0.507	0.1%	3.89	1.97
66	Processed, preserved, dried vegetable and	KG	0.150	0.420	0.5%	2.22	0.93
	TOTAL MONTHLY				100%		63.33
	ANNUAL TOTAL PER PERSON						760.00

Source: BiH LSMS (2001). Note: Calculated from the BiH-LSMS, using as a reference group those individuals in the 10th to 30th percentiles.

Annex 3. Constructing A General Poverty Line

There is clearly a notion of absolute need in setting the minimum non-food requirement. For example, health is essential for survival, and being healthy requires spending on clothing, shelter etc. Also, many activities normally deemed essential for escaping from poverty cannot be performed without participation in activities such as employment, education, etc. Hence, even people who are well short of meeting food energy requirements spend money on non-food goods.

As noted in the recent overview by M. Ravallion²¹ “*Of all the data that go into measuring poverty, setting the non-food component of the poverty line is probably the most contentious*”. The basis for choosing a non-food requirement is rarely transparent, and very different poverty lines can result, depending on the choices made. Questions that have to be answered to make these choices more transparent are:

- Which group’s food share should be used (that of the poor or the non-poor)?
- In what sense does the resulting line assure “basic non-food needs”?

Ravallion demonstrates that there are objectively defined bounds on poverty lines. Specifically, he shows that under realistic assumptions, the *poverty line cannot exceed the total spending of those whose actual food spending achieves basic food needs*. This group is therefore the key **reference population** group for defining the absolute poverty line. As explained in section IV.B, it is unlikely that the data will uncover a substantial number of households whose actual food spending is equal to the poverty line, therefore one has to set an interval around the poverty line to define this reference group.

We have chosen a bound of ± 5 percent around the extreme (food) poverty line, and have obtained an average food share of 35 percent. But we observe a very large variation of the food share within this interval: the median, which is a plausible estimate given the amount of variation, gives a 34 percent estimate. Changing the interval also shifts the estimate of the food share.

One can use non-parametric methods which impose the interval or the statistics to be estimated. To give a simple example, one can calculate the mean total expenditure of the sampled households whose food spending lies within a small interval (± 1 percent) around the food poverty line, then do the same for a larger interval (± 2 percent), then for a still larger interval (± 3 percent), etc. Then one takes an average of all these mean total expenditures and derives the food share. This gives a weighted non-parametric estimate with the highest weight on the sample points closest to the food or extreme poverty line (with weights declining linearly around this point). Applying this approach with BiH LSMS data produces a result that is quite different from a simple calculation of a median: 32 percent with a very large 95 percent confidence interval between 22 and 42 percent.

Will imposing a specific form for the relationship between food consumption and welfare help? As suggested by Ravallion (1994), the food share can be estimated using a food-share Engel curve of the form:

²¹ Ravallion M. Setting Poverty Lines: Economic Foundations of Current Practices. World Bank. 2001.

$$f(y_i)/y_i = \alpha + \beta_1 \log(y_i/b^f) + \beta_2 [\log(y_i/b^f)]^2 + \gamma'(d_i - \bar{d}) + \text{residual}_i$$

for sampled household i , where d_i is a vector of demographic variables, y_i is the level of consumption, $f(y_i)$ is the food consumption of a household i , b^f is the cost of the minimum food basket (extreme poverty line) and α , β_1 , β_2 , γ are parameters to be estimated. The value of estimate α obtained from the regression gives the average food share of those households that can just afford basic food needs. The poverty line is then given by b^f/α^* , where α^* is:

$$\alpha^* = \alpha + \beta_1 \log(1/\alpha^*) + \beta_2 [\log(1/\alpha^*)]^2$$

This can be readily solved numerically. The application of this method to the full sample leads to a regression result in which none of the parameters are statistically different from zero. To obtain any precision we need to clean the data, removing all observations with zero food share and those with food share 3 standard deviations below the national average. Once this cleaning is done, we obtain an estimate of the food share for the poverty line of 38 percent.

This method of estimating the Engel curve produces a result which is inherently dependent on the choice of per capita equivalence scale. As proposed by Luttmer (2000), this approach can be extended and generalized to any equivalence scale. It aims at directly estimating what level of equivalent consumption corresponds to a sufficient food intake.

We specify the following key variables: variable *RelFood* is the ratio of household food consumption to the cost of the minimum food basket for the household. Hence, if *RelFood* equals one, the household spends exactly as much on food as is required to purchase the minimum food basket for the household. The variable *EqCons* is equivalent consumption for all modifications (as described in Annex 1). Our baseline poverty line is estimated using our baseline equivalence scale, per capita, but we will also use alternative equivalence scales to test the sensitivity of the results.

We specify a log quadratic relationship between *RelFood* and *EqCons*, and estimate this relationship by non-linear least squares:

$$\ln(\text{RelFood}_i) = \alpha_0 + \alpha_1 \ln(\text{EqCons}_i) + \alpha_2 \ln(\text{EqCons}_i)^2 + \varepsilon_i$$

where i indexes households, α s are coefficients to be estimated, and ε_i denotes the error term. After estimating this equation, we solve it for the level of equivalent consumption at which the household just attains the minimum food intake (i.e. *RelFood*=1):

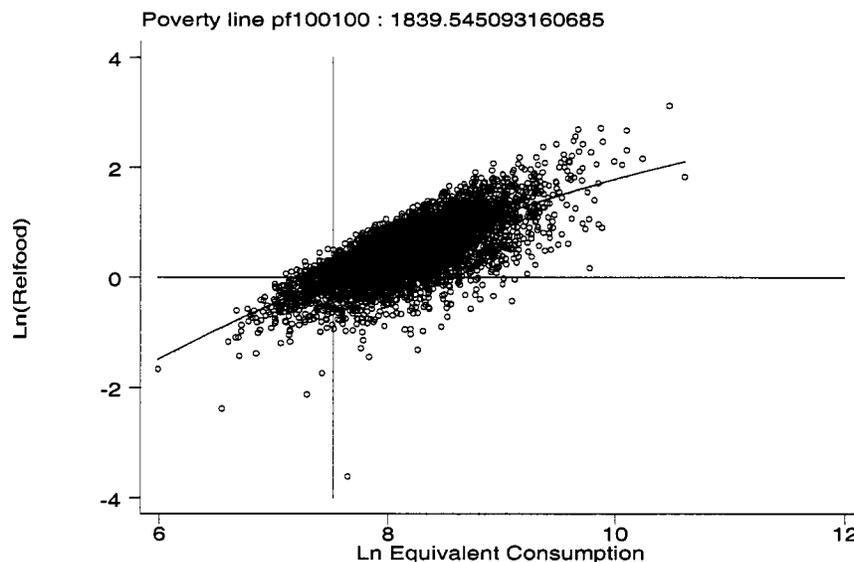
$$\ln(1) = 0 = \hat{\alpha}_0 + \hat{\alpha}_1 \ln(\text{Povline}) + \hat{\alpha}_2 \ln(\text{Povline})^2$$

where the carets on the α s indicate the regression estimates, and *Povline* is our estimate for the poverty line. Solving this equation yields:

$$Povline = \exp\left(\frac{-\hat{\alpha}_1 \pm \sqrt{\hat{\alpha}_1^2 - 4\hat{\alpha}_0\hat{\alpha}_2}}{2\hat{\alpha}_2}\right)$$

The advantage of this method is that it is inherently more robust to outliers, and we do not need to discard as many observations, as we did for the direct fitted Engel curve regression, to obtain statistically significant results. This approach is becoming more intuitive as presented on the graph. The vertical axis on Figure C-1 gives actual food consumption of a household relative to the cost of the minimum basket (in logs): it is equal to zero when the household spends exactly as much as needed. The horizontal axis is the consumption per equivalent unit (in our case, per capita). Each dot on the Figure is a household in the LSMS. The upward sloping curve is the estimated relationship between food consumption (expressed as the number of minimum food bundles consumed) and total consumption. Intersections of this Engel curve line with the horizontal line representing minimum food requirements gives the level of consumption at which basic food needs are met, i.e. the poverty line (vertical line).

Figure C-1 Actual relative food consumption, fitted relative food consumption line, and derivation of the Poverty Line using the per capita scale.



Source: BiH LSMS and regression results

Table C-1 shows the estimates for the poverty lines obtained using all listed methods for various equivalence scales. We start with our baseline approach, and show what differences emerge when one applies the median food share approach, or a set of parametric approximations, and we then show the results of applying alternative equivalence scales. As the table shows, the estimates of the poverty rate are very sensitive to the method chosen for estimating the food share but, once set, are relatively insensitive to the choices of equivalence scale. Our baseline case, using the per

capita equivalence scale, which estimates the poverty rate at 19.5% of the population, lies toward the upper bound of the estimates presented.

Table C-1 Poverty Lines Based on Various Method of Estimating the Food Share and Various Equivalence Scales

Methods to derive food share and equivalence scales			Poverty Rate	Characteristics of the Poverty Line (% or KM per household per year)				
Method and scale	α	θ		Food/Non Food**	Value for Single Adult	Value for Single Parent	Value Couple w/o children	Value Couple with 2 children
Per capita, average reference	1.00	1.00	19.5	35/65	2198	4396	4396	8792
Per capita, median reference	1.00	1.00	20.7	34/66	2243	4485	4485	8970
Per capita, fitted Engel curve	1.00	1.00	15.4	38/62	2010	4020	4020	8040
Per capita, fitted relative food	1.00	1.00	12.3	41/59	1840	3679	3679	7358
OECD-I, median reference	0.5	0.84*	22.5	37/63	3850	5005	5775	8084
OECD-II, median reference	0.3	0.68*	22.8	36/64	3081	4622	5238	8320
ECA poverty, median reference	1.00	0.75	21.5	33/67	3205	5390	5390	9065

Source: BiH LSMS (2001). Notes: The OECD equivalence scales are defined in Chapter VI.B. The ECA poverty values are from World Bank report entitled "Making Transition Work for Everyone: Poverty and Inequality in Europe and Central Asia." (World Bank 2000b) *Implied value, estimate based on BiH demographic structure; ** Percentage on average.

It is important to note that each of the methods presented here is defensible on technical grounds. The most simple and unsophisticated approach gives results that are as plausible as much more demanding methods.

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Regional Forum for Gender Focal Points

ECA Region

November 24, 2003

*Background information and talking points for welcoming message and introduction
prepared for Annette Dixon*

This note contains background information and talking points for the introductory remarks to the Regional Forum for Gender Focal Points. The Forum will take place on **Nov 24, 2003 in MC 4-W150**. You are scheduled to give the introductory remarks **9:00-9:15**. This note is organized into two sections:

1. General information about the meeting
2. Talking Points

1. GENERAL INFORMATION ABOUT THE MEETING

Over the last couple of years all country offices of the ECA region – with the exception of Bosnia – has appointed a member of staff to act as Gender Focal Point. None of the appointed people is a gender specialist and most of them to date have had very little exposure to gender analysis and gender related issues. However, in the context of increasing decentralization of World Bank activity and the growing emphasis on gender as an important issue of development, the role of the Gender Focal Points in mainstreaming gender in WB activities and monitoring the implementation of the WB gender strategy is acquiring increasing importance.

Last year we held in Warsaw the first learning programs designed to support the Gender Focal Points in taking on increasing responsibilities in this area. At the end of the event the Gender Focal Point expressed an interest in meeting annually to exchange experiences and share concerns.

This forum is designed as a follow up to the Warsaw meeting. The focus of the event is on (i) monitoring the progress towards gender mainstreaming – at country, regional and global level -; (ii) preparing and action plan for gender mainstreaming in ECA; (iii) finalizing the TORs of the GFPs; and (iv) establishing a regional network of Gender Focal Point.

In addition to exchanging experiences and sharing concerns, the objective of the meeting is to set up a sustainable long distance network and. An agenda is attached.

Your introductory remarks are expected to last for about 10 minutes.

2. TALKING POINTS

During your remarks, we would appreciate it if you could convey the following main messages:

1. Attention to gender is essential to the Bank's and the ECA region's mission of poverty reduction; and
2. Paying attention to gender issues is the responsibility of all Bank staff.
3. Over the last years the ECA region has gone a long way in mainstreaming gender in WB operation and the WB has become much more visible in supporting ECA countries in improving gender equality.
4. In the context of increasing decentralization of World Bank activity and the growing emphasis on gender as an important issue of development, the role of the Gender Focal Points in mainstreaming gender in WB activities and monitoring the implementation of the WB gender strategy is acquiring increasing importance.
5. This focus event is designed to support the Gender Focal Points in taking on increasing responsibilities in this area.

I. Introduction and thanks:

- I am delighted to be given the opportunity to welcome you to the first learning program for gender focal points.
- I would like to thank all of you for agreeing to participate in this event.

II. Attention to gender is essential to the Bank's and the ECA region's mission of poverty reduction:

Gender inequality retards economic growth and poverty reduction. This is a key conclusion of the World Bank report *Engendering Development-Through Gender Equality in Rights, Resources, and Voice*. As the report makes clear, there is growing evidence that several aspects of gender relations – the gender-based division of labor; disparities between males and females in power and resources; and gender bias in rights and entitlements – contribute to poverty and reduce the well-being of men, women and children. Gender-responsive development actions, therefore, are critical to effective poverty reduction,

Gender is essential to the ECA region's poverty reduction mission - there are important gender issues in the region:

As the recent report *Gender in Transition* points out, the transition has had different impacts on women and men. These differences are essential to the economic and social development of the region. You will be discussing these issues in more details over the next couple of days.

III. Paying attention to gender issues is the responsibility of all Bank staff – implications for ECA staff:

Gender inequalities have important policy implications for the Bank and need to be integrated into our work. We know that development policies that do not take gender relations into account and do not address such disparities will have limited effectiveness. Let me highlight a couple of areas where the policy implications of gender inequality in

the ECA region are particularly pronounced and give some examples of how we can conduct our work in a more gender sensitive fashion:

1. Integrating gender issues in pension design: The case of pension reform in **Poland** illustrates the fact that more equal labor market incentives will only provide more equal outcomes if equality exists in labor market opportunities.

- Simulations show that after reform, average yearly female pension benefits will decrease from around 80 percent of male benefits in the old system to 73 percent of male benefits in the new system. By linking pension benefits more closely to contributions, reform has made labor market incentives between men and women more equal. However, labor market opportunities seem to become more unequal in Poland: the gender pay gap among highest paid workers increased by 13 percent between 1985 and 1997.
- *The experience in Poland indicates that minor reforms such as changes in retirement age can have major impacts on gender outcomes. This points to the need for gender analysis prior to reform. Gender sensitive modeling of pension reforms prior to introduction can prevent unexpected increases in old-age poverty and reduce reliance on social assistance.*

2. Integrating gender into public sector down-sizing programs: Public sector downsizing often have gender-differentiated effects, for example:

- Layoffs are rarely distributed evenly among men and women. In part this can be because women are often concentrated in the public sector (due to higher relative wages, benefits such as maternity leave, affirmative action programs, discrimination in the private sector, etc).
- Women who are laid-off from public sector jobs often suffer greater relative losses in both income (due to the fact that the public sector wage premium is generally larger for women than men) and non-income benefits (flexible hours, maternity leave, etc) than their male counterparts.
- *Gender analysis is an important component in understanding the negative distributional consequences of downsizing programs and in providing input to the design of retrenchment packages. In **Vietnam**, for example, the Poverty Reduction Support Credit recommended the minimization of gender differentiated impacts. As in most countries, individual separation packages were to be based on two components: a lump sum and a multiple of earnings. After performing simulations of the impacts of different separation packages on various groups, the specific weights placed on the two components were selected so as to minimize systematic over or under compensation based on gender.*

A presentation on this issue is scheduled for Tuesday morning

▪ **Integrating gender into our work in the ECA region is a challenge.** Moving forward I think it is particularly important that we work to:

- **Mainstream gender into our main instruments:** such as *Poverty Reduction Support Credits* (as our colleagues did in Vietnam); *Structural Adjustment Credits*, *Poverty Assessments*, *Public Expenditure Reviews*,

and also Country Assistance Strategies. In a region where gender inequalities remain relatively small but future trends in a number of areas are matter for concern, it is important to recognize that economic policies and structural reforms that are gender neutral in principle may in practice have different effect on men and women.

- **Initiative new analytical work on gender:** Ground breaking work is already being initiated in the region, for example, on the economic cost of alcoholism, and on gender issues in the informal labor market. Other potential areas include analytical work on **intra-house hold allocation and time-use.**
 - **Keep in mind that gender appropriate actions means attention to both women and men:** Several emerging trends in the ECA region argue for greater attention to male-specific gender issues. The trend of relative decline in male life expectancy for example points to gender-specific risks – related to rising unemployment and growing alcoholism and depression among men – for which gender-targeted social programs may be warranted. In the ECA region in particular, I believe we need to remind ourselves that gender issues include both male and female issues.
- **But important steps in the right direction have been taken over the last years.** These progresses will be reviewed extensively over the day.

IV. Conclusion:

- Let me reiterate three main messages: i) we are aware that there are important gender issues in the ECA region - attention to these issues is essential to ECA's mission of poverty reduction; ii) paying attention to gender issues is the responsibility of all Bank staff, but iii) the role of the Gender Focal Points in this context is paramount in both implementing the gender strategy and monitoring its implementation.
- Development policies that do not take gender relations into account and do not address such disparities will have limited effectiveness. The ECA VP stands ready to assist and support the Gender Focal Points in their attempt to mainstream gender into our work in the region.

