

FYR of Macedonia: Measuring Welfare using the Survey of Income and Living Conditions (SILC)

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1. Introduction

In spite of solid economic growth, FYR Macedonia's track record of poverty reduction was not stellar during most of the 2000s. Between 2002 and 2009, FYR Macedonia grew at 3.7 percent annually in real terms which – though below the SEE6 average – enabled FYR Macedonia to reduce its income gap with the EU. Between 2002 and 2009, FYR Macedonia's GDP per capita grew from 25 percent of the EU's GDP per capita in international dollars to 36 percent in 2009 (World Bank – International Finance Corporation, 2014). However, poverty did not decrease during this period, but actually it increased. Poverty, estimated using an absolute line, was 19% in 2002, and it increased to 24% in 2008¹.

The recent trends on poverty and income distribution are unclear due to methodological changes. Since 2008, FYR Macedonia's average GDP growth has declined to less than 2 percent per year and convergence to the EU has stalled (World Bank – IFC, 2014; FYR Macedonia SSO, 2014a). However, given a break in the poverty series from new ways of monitoring poverty, limited information is available on the recent linkages between growth and household welfare. Specifically, the official poverty measurement methodology in FYR Macedonia changed in 2010 (Box 1), moving from a consumption-based to an income-based welfare aggregate. Before 2010, official poverty estimates were measured using a consumption aggregate based on data collected in the Household Budget Survey (HBS) and using a relative poverty line of 70% of median consumption; other estimates were available, mainly by the World Bank, using a national absolute poverty line. In recent years, concerns about the representativeness of the HBS have been raised because of a considerable increase in the nonresponse rates in certain regions of the country. Nevertheless, starting in 2010 and with support from Eurostat, FYR Macedonia State Statistics Office (SSO) moved to collecting household income using the Survey of Income and Living Conditions (SILC), with the objective of producing poverty and social statistics comparable with EU member countries. Poverty is now measured as 60% of the median income, and the SILC has allowed the production of additional indicators, such as material deprivation and low-work intensity, monitored as part of the Europe 2020 strategy for reduction of poverty and social exclusion in the EU (European Commission, 2013). Other aspects of adopting the SILC, such as the suitability of income-based measures for a country like FYR Macedonia, need further analysis (Box 2).

This note expands the analysis on poverty and income distribution reported by the FYR Macedonia SSO for 2010 and 2011. The present work is based on an analysis performed *in-situ* by World Bank staff on the offices of the FYR Macedonian SSO, given the restricted-access policy for the data. The analysis is expected to be updated in June 2015 with information from the 2012 and 2013 SILC, which will allow for a richer analysis, particularly in terms of time trends. The analysis presented here, however, is considered valuable in that it provides first insights into the socio-demographic characteristics of the bottom of the income distribution and the interactions between different measures of poverty. The poverty and inequality statistics are complemented with socioeconomic characteristics of the poor and the bottom 40 percent², an analysis of the sources of income at the household level, and an international benchmarking of poverty in FYR Macedonia. Finally, this note benchmarks the poverty measurement currently used in FYR Macedonia, the At-Risk-of-Poverty and Social

¹ The value of the absolute poverty line used was 97.5 denars a day in 2002, and 112.3 in 2009. This line was defined in 2002 and updated using CPI information.

² The World Bank has adopted a new strategy with two institutional goals on poverty and shared prosperity. For poverty, it aims at reducing the percentage of people living on less than \$1.25 a day globally to 3 percent by 2030. For shared prosperity, it will aim at fostering income/consumption growth of the bottom 40 percent of the population in every country.

Exclusion (AROPE), with other measurements of poverty based on different poverty lines, which allows for a better understanding of the policy implications of transitioning the new ways of measuring poverty.

Comparing and understanding different ways of measuring poverty – as presented in this note - is key for policymaking, as each measure may be useful to respond to different policy objectives. Relative measures, such as 60% of the median income, for example, capture whether prosperity is shared and benefits all, and can be understood as a measure of inequality. Absolute measures, in contrast, focus on measuring access to a minimum standard of living, and it can be more appropriate in contexts where not all the society have achieved this minimum standard and thus policy targeting is needed, and to evaluate how economic fluctuations affect the poor and the vulnerable. It is important to note that as a country moves to a different way of measuring poverty – such as FYR Macedonia and other countries in the region - the information provided by poverty measures may change. For instance, the new measure could be identifying different populations with different characteristics. In addition, in crisis periods, relative poverty may register little or no change, in spite of a deterioration in the living standards of the population.

The analysis yields two main findings. First, poverty in FYR Macedonia in 2011 affected 26.8% of the population, according to the official methodology used by the SSO. A recent publication by the SSO reports a poverty rate for 2012 of 26.2%. Inequality, in turn, stands at a Gini of 38.5, still higher than other Western Balkan economies. Results also show that poor and bottom 40 households tend to have more children, are more rural, and have less access to public services. These households are also headed by people with lower education and with considerably worse labor market outcomes than their more affluent counterparts (lower employment rates and higher unemployment and inactivity rates). Consistent with this result, the bottom 40 and poor households rely considerably less on labor earnings as a source of income, and considerably more on social protection transfers. Compared with EU28 countries, FYR Macedonia still lags behinds in the three components of the AROPE indicator.

Second, the characteristics of the poor are largely consistent using various poverty measurement methodologies. Specifically, most characteristics of the population identified by the new relative poverty line (60%-of-median income) are consistent with those identified by a national absolute poverty line. Among these characteristics are low education, weak attachment to the labor market, mostly rural location, high number of household members and children and lower access to services than the non-poor. At the same time, analysis shows that the AROPE indicator captures all the poor as defined by the World Bank absolute national poverty line (constructed in 2002 using consumption-based data and referred to here as the national absolute poverty line or 2002 line). This is explained mainly by the complete overlapping with the income-poor component of the AROPE. Finally, the AROPE indicator also overlaps considerably with the bottom 40 percent of the distribution. This result is driven by the cumulative effect of overlaps among all three AROPE components and the bottom 40 percent; nevertheless, for one-on-one comparisons between the bottom 40 and the three components, considerable shares of the bottom 40 are still not captured.

The following section presents recent poverty and inequality indicators for FYR Macedonia. Section 3 delineates a poverty profile for the poor and the bottom 40, and analyzes the sources of income for FYR Macedonian households. Section 4 benchmarks the country with other countries, based on poverty and AROPE indicators, and examines the overlap between the AROPE and its components with other methodologies of identifying the less well-off. Section 5 concludes.

2. Poverty and Inequality

In 2012, poverty using a relative measure was estimated at 26.2%, very close to 2011 (26.8%) and 2010 (27.0%) as reported by FYR Macedonia SSO. Poverty, using the relative measure from the SILC, continues to affect slightly more than a quarter of the population of the country (Table 1).

Table 1: Poverty Based on Per Adult Equivalent Household Disposable Income

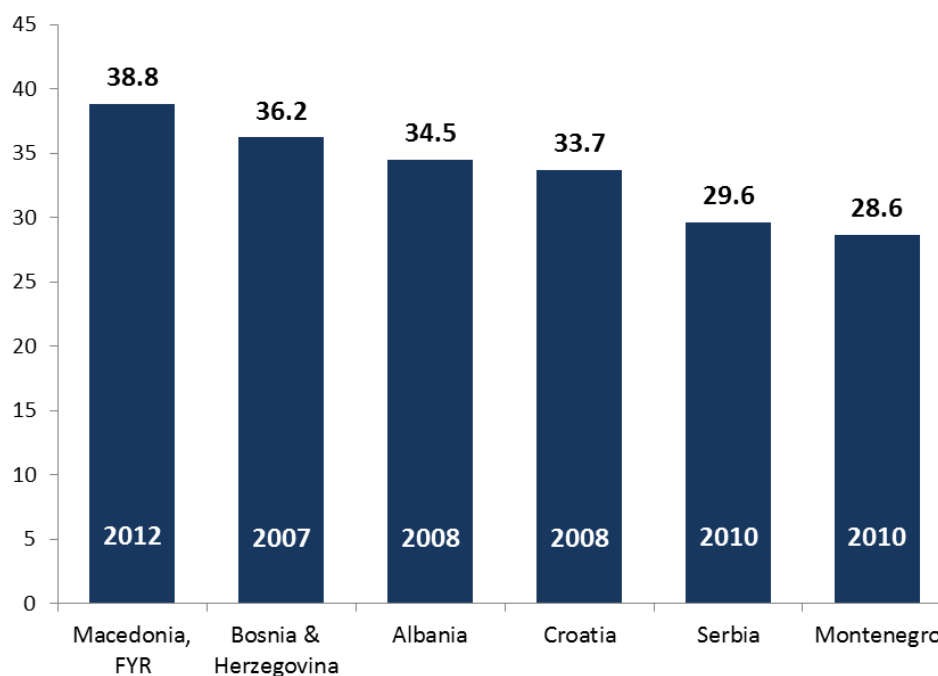
| | 2010 | 2011 | 2012 |
|---|------|------|------|
| Headcount ratio | 27.0 | 26.8 | 26.2 |
| Gini coefficient | 40.9 | 38.5 | 38.8 |
| Inequality of income distribution S80/S20 | 11.3 | 10.6 | 10.2 |

Note: Poverty line defined as 60% of the median per adult equivalent income.

Source: FYR Macedonia SSO (2014b)

Income inequality in 2012 was nearly 40 Gini points. In 2012, income inequality was measured as 38.8 Gini points, a slight increase from the 38.5 points registered in 2011 (Table 1). FYR Macedonia has now entered the group of countries with inequality below 40 Gini points; however it is still ranked as the highest compared to their regional peers (Figure 1). A related indicator, though, shows an opposite trend in inequality in the country. The 80th/20th percentile ratio shows an increase, which may be signaling increasing polarization in the country.

Figure 1: Gini Coefficient in FYR Macedonia and selected countries



Note: Latest year available, year of reference indicated in the base of the bar.

Source: World Development Indicators and FYR Macedonia (2014b)

Box 1: How Poverty is Measured in FYR Macedonia?

Poverty is measured in FYR Macedonia based on household level data, and using an income-based welfare aggregate and a relative poverty line. This methodology has been in place since 2010, and it is consistent with the methodology in EU countries, according to the Europe 2020 strategy. In addition, official poverty indicators also report Severe Material Deprivation and Very-Low Work Intensity, two non-monetary indicators oriented to capture vulnerability and social exclusion. Here we present in detail how the household data is collected, and how the income-based welfare aggregate and relative poverty line are constructed, following the official methodology used by FYR Macedonia SSO.

Household-Level Data Collection

Household level data is collected using the Survey on Income and Living Conditions (EU-SILC), an annual survey conducted for the first time in 2010. The sample size is of approximately 5,000 private households in the country. The main scope of this survey is to enable the compilation of statistics on income distribution and indicators of monetary poverty, but also serves to produce reliable quantitative information on social exclusion and material deprivation. All work related to the SILC project is supported by Eurostat, in order to ensure comparability among countries. Information on social exclusion and housing conditions is collected at household level, while labor, education and health-related data are obtained in respect of persons aged 16 and over.

Observation units are households and persons who live within. The survey covers all the persons aged 16 and over. A household is every family or other community of people that live together and spend their incomes together in order to cover their basic costs (for living, food, etc.) regardless of whether all the members of the household are continually present in the place of residence or whether some of them are staying for a longer time in another place or country for purposes of employment or education or other reasons, but have been in the country for at least 6 of the last 12 months.

A stratified two-stage sampling design is used for this survey. In the first stage a simple random sampling of the primary sampling units (PSU) from Population Census 2002 is carried out. In the second stage a simple random sampling was made to select secondary sampling units (households) – with random number generation. Stratification was made by regions (8 regions – NUTS3 level) and degree of urbanization (urban and other), resulting in a total of 16 strata.

The nonresponse rate for the 2010 SILC was 20.5% at the national level. Along the urban/rural divide, non-response was higher in urban centers, reaching almost a quarter of the households interviewed, while in non-urban areas the rate was 15%.

Income Aggregate

The income aggregate used includes income from market sources and cash benefits. Income from market sources includes employee cash or near cash income, non-cash employee income, cash benefits from self-employment, income from rental of a property or land, regular inter-household cash transfer received, interest, dividends, profit from capital investments in unincorporated businesses and income received by people aged under 16. Cash benefits are a sum of all unemployment benefits, old age and survivor's pensions, sickness and disability benefits; education-related, family/children related and housing allowances; and benefits for social exclusion or those not elsewhere classified. Direct taxes and regular inter-household cash transfers paid are deducted from gross income to give disposable income. The current definition of total household disposable income used for the calculation of presented indicators excludes imputed rent, value of goods produced for own consumption, social transfers in kind and non-cash employee income except company cars. The income reference period is a fixed 12-month period from the previous calendar year.

To reflect differences in household size and composition, the income figures are given per equivalent adult. This means that the total household income is divided by its equivalent size using the so-called modified OECD equivalence scale, which gives a weight of:

- 1.0 to the first adult;
- 0.5 to any other household member aged 14 or over;
- 0.3 to each child below age 14.

The resulting figure, which is the sum of these weights, is attributed to every member of the household. Thus, for instance, a household that consists of 2 adults and 2 children below the age of 14 is therefore: $1.0 + 0.5 + (2 \times 0.3) = 2.1$.

Poverty Line

Referred to as the at-risk-of-poverty line. This is equivalent to 60 percent of the median national equalized income of the persons living in households.

Source: FYR Macedonia SSO(2013)

The new official relative poverty line³ results in a poverty rate considerably higher than the one obtained from national absolute poverty line, or the World Bank regional poverty lines of \$5 and \$2.50 a day (Table 2). Although this poverty note bases its findings on the aforementioned official relative poverty line, we compare these results with estimates coming from absolute poverty lines, in order to identify differences and make sure the populations identified as poor by each line are not strikingly different. The poverty rate under the new poverty line is twice the size of the identified under the 2002 line (26.8 percent against 13.1)

The differences in rates across poverty lines decreases considerably when the welfare aggregates used are scaled using per capita factor instead of the per adult equivalent factor. For instance, when measuring poverty using income per capita, poverty estimates coming from the new relative line and the 2002 line differ only in 5 percentage points. Moreover, the \$5-a-day poverty line results in rate almost identical to the new relative line. These last results highlight the effect that using the per-adult equivalent scale (instead of per capita scale) has on poverty estimates, particularly as poor households have more children, as it results in higher welfare aggregates and lower poverty rates.

Table 2: Poverty Measures of Income, 2011

| | Relative | | Absolute | |
|-----------------------------|------------|-----------|----------|-----------|
| | 60% median | 2002 line | \$5 PPP | \$2.5 PPP |
| Per-adult equivalent | | | | |
| Headcount ratio % | 26.8 | 13.1 | 15.9 | 8.5 |
| Per capita | | | | |
| Headcount ratio % | 28.8 | 23.2 | 28.0 | 13.9 |

Note: Official Poverty Line is 60% of median, per-adult equivalent.

Source: FYR Macedonia SSO (2014b) and World Bank staff calculation based on SILC 2011.

Box 2: Income-based and Consumption-based Poverty Indicators: A Contrast

Measuring poverty using a monetary indicator requires identifying a measure of welfare at the household level, and define a threshold for defining poverty. Choosing either income-based or consumption-based

³ The value in 2011 was defined in 43,267.4 denars per year, while the value for the 60% median poverty line in 2011 was 87,041.1 denars per year.

aggregates has some advantages and disadvantages, depending on the economic environment of the country, as listed below.

A. Income

- Income captures the flow of (mostly monetary) resources that are available to a household, and thereby is generally considered as a good proxy of the sustainability of access to resources by the household.
- Current income reacts most directly to employment and social policies, and on which we can simulate and evaluate the impact of policies (e.g. through micro-simulation).
- Income can be easily collected when is mostly composed of wages and salaries. It may be possible to get adequate (if understated) information on interest, dividends and income from some type of self-employment.
- It is hard to get an accurate measure of farm income, the value of housing services and capital gains. For instance, the value of animals on a farm or the change in the value of a house is not always readily available for collection when an interview is performed.
- Income tends to be underreported, especially in societies with large agricultural or self-employed populations. The reasons for this can be several, like for instance people forgetting items sold, reluctance to disclose the full extent of income, or reluctance to report income earned illegally.
- Income measures do not capture how household smooth consumption when facing a negative or positive economic shock.
- Income does not capture the advantage of having free or subsidized access to services, such as housing, health care, education or child care.

B. Consumption

- Households are more willing to recall what they have spent rather than what they earned, resulting in a more accurate picture of household wellbeing.
- Still consumption can be underreported, especially consumption of luxuries or illicit items, or if the questions asked are not that detailed.
- Expenditure-based indicators are less volatile and capture wellbeing better than income-based indicators, given that is based on actual consumption of the household.
- Consumption patterns are informative for policymaking, for example in terms of food consumption and caloric intake, energy expenses, expenditure impact of income transfers and others.
- In affluent countries where a large share of the population has access to credit and savings, measures based on consumption may be misleading.

Most developed countries base their poverty indicators on income, mainly because it is easier to collect than consumption and that given the structure of their economies, figures result in reasonably accurate estimates. As FYR Macedonia moves from consumption to income as a measure of welfare, it is important to keep in mind characteristics of the FYR Macedonian economy, such as high informality and reliance on farming income for poor rural households that can make more complex poverty estimations, in order to avoid inaccuracies when identifying the poor.⁴

Source: Haughton and Khandker (2009) and World Bank staff, with contributions from Isabelle Maquet.

⁴ Informality increased in FYR Macedonia from 28 percent in 2007 to 32 percent in 2011; informal employment in agriculture and retail trade, which is mostly informal, accounted for over 40 percent of net jobs created in this period (World Bank analysis using LFS data).

3. Poverty profile: poor and bottom 40 percent⁵

The poor and the bottom 40 percent of the population have low education, weak attachment to the labor market, are more concentrated in rural locations, have higher number of household members and children, and lower access to services. The World Bank has adopted two institutional goals on poverty and shared prosperity. For poverty, it aims at reducing the percentage of people living on less than \$1.25 a day globally to 3 percent by 2030. For shared prosperity, it aims at fostering the income growth of the bottom 40 percent of the population in every country. Given poverty levels in FYR Macedonia and the stubbornness of poverty in the past decade – even in times of economic growth – both indicators remain relevant as development targets for the country. This section presents results from a household profiling exercise of poverty and bottom 40 percent status in 2011, aimed at highlighting key differences between economic groups in the country and informing policy to improve living standards of the less well-off. Results show that the most striking differences between groups are in human capital and jobs.

3.1. Household and Household Head Characteristics

Poor households and households in the bottom 40 percent tend to live in larger houses. Looking at the poor and non-poor divide we can observe that poor households are more likely to live in larger household, as they have higher shares of households with 5 or 6+ members. (Table 3). In fact, for 2011, about one third of all poor population lived in households of the size 5 or higher, compared to about one quarter of all non-poor households. For households in the bottom 40 percent, the trend is similar. This result may be driven by a higher share of children in these households.

Less well-off households have a slightly higher share of children 0-14 years old. While the more affluent groups have a share of children among household members of around 10 percent, for the poor and bottom 40 this share goes up to around 14 percent. Somehow surprising, the share of elderly (65 or more years old) shows an inconsistent pattern between the poor and the bottom 40%. While the bottom 40 has a higher share, the poor has a lower share of elderly. In any case, the higher share of children together with the higher household size points at a higher burden on the working age adults at home responsible for providing for their families.

Poor households and households in the bottom 40 percent are relatively more likely to live in detached houses, which may be capturing a more predominant rural location of their dwellings. While across all divides the predominant type of dwelling is the detached house (more than 70%), for the poor and the bottom 40 these shares go up to more than fourth fifths of each group. The categories unequivocally urban, as are apartments in buildings, have larger shares among the more affluent groups, which reinforces the idea of detached houses being a proxy for rural location in some cases.⁶

Table 3: Household Characteristics by Poverty and Bottom 40% Status (2011)

| | All | Bottom 40% | Top 60% | Poor | Non Poor |
|----------------------------------|------|------------|---------|------|----------|
| Household Characteristics | | | | | |
| Size | | | | | |
| 1 | 11.0 | 13.5 | 9.3 | 10.5 | 11.2 |

⁵ The rest of the note is based on a welfare aggregate based on gross income. This leads to a slightly higher poverty rate (28.6 in 2011). Results, though, still identify clearly the poor and bottom 40 and their characteristics.

⁶ The relevant urban/rural variables is not made available in the SILC.

| | | | | | |
|---|------|------|------|------|------|
| 2 | 24.0 | 25.0 | 23.4 | 26.1 | 23.3 |
| 3 | 16.0 | 12.8 | 18.1 | 12.8 | 17.2 |
| 4 | 22.0 | 18.0 | 24.7 | 18.2 | 23.5 |
| 5 | 12.6 | 13.8 | 11.8 | 14.8 | 11.8 |
| 6+ | 14.4 | 16.9 | 12.8 | 17.7 | 13.2 |
| Composition | | | | | |
| Share children 0-14 | 11.5 | 13.2 | 10.4 | 14.5 | 10.4 |
| Share elderly 65+ | 23.6 | 25.7 | 22.2 | 22.5 | 24.0 |
| Dwelling type | | | | | |
| Detached house | 71.7 | 80.6 | 65.7 | 82.3 | 67.7 |
| Semi-detached house / Terrace | 10.1 | 10.6 | 9.8 | 9.9 | 10.2 |
| Apartment / flat in bldg. <10 dwellings | 2.5 | 1.2 | 3.4 | 1.1 | 3.0 |
| Apartment / flat in bldg. 10+ dwellings | 15.4 | 7.4 | 20.7 | 6.6 | 18.7 |
| Other | 0.3 | 0.2 | 0.4 | 0.2 | 0.4 |
| Tenure status | | | | | |
| Owner | 90.7 | 89.8 | 91.3 | 90.0 | 91.0 |
| Tenant / sub-tenant (market price rent) | 0.5 | 0.5 | 0.6 | 0.7 | 0.5 |
| Tenant / sub-tenant (reduced rent) | 0.3 | 0.3 | 0.4 | 0.2 | 0.4 |
| Free | 8.4 | 9.4 | 7.8 | 9.2 | 8.2 |
| Rooms | | | | | |
| 1 | 1.3 | 0.7 | 1.7 | 0.7 | 1.6 |
| 2 | 29.7 | 37.2 | 24.7 | 38.9 | 26.2 |
| 3 | 30.7 | 29.7 | 31.4 | 29.2 | 31.2 |
| 4 | 22.9 | 20.7 | 24.5 | 19.6 | 24.2 |
| 5+ | 15.4 | 11.8 | 17.8 | 11.7 | 16.8 |
| Over-crowding | | | | | |
| Mean ratio (hh size/rooms) | 1.2 | 1.2 | 1.1 | 1.3 | 1.1 |
| Share ratio>2 | 6.7 | 10.6 | 4.2 | 12.0 | 4.7 |
| Share ratio>3 | 1.4 | 2.3 | 0.8 | 2.9 | 0.9 |
| Access to services | | | | | |
| Flush toilet in unit/shared | 14.0 | 73.4 | 94.4 | 68.4 | 92.7 |

Source: World Bank staff estimates based on SILC 2011.

Home ownership is fairly high in FYR Macedonia across all the groups considered; however, access to services differs significantly between the poor and the non-poor and between the bottom 40 and the top 60 percent. For instance, while around one quarter of household in the bottom 40 percent does not have access to flush toilet in the unit, this figure falls considerably to only a few percentage points among the top 60 percent. Along the poverty status division, the differences are even bigger. These results may be related with a higher prevalence of rural households among the poor and bottom 40, as services are more difficult to provide for these areas. For the top 60 and non-poor, with a higher prevalence of urban dwellings (e.g. apartments), is common to have higher access to services, as these units rarely do not have access to services.

Poor households and those in the bottom 40 percent are significantly more likely to live in smaller and more crowded houses. Considering that poor and bottom 40 households tend to have more members, obtaining that they also live in smaller dwellings lead, inexorably, to the higher reported overcrowding in these groups. Using the household members per room as a metric for overcrowding, we obtain the share of households with more than two people per room was more than twice in the bottom 40 percent compared to the top 60 percent, and a similar pattern repeated along the poverty status.

Differences in the gender and age of household heads are small between poor and non-poor households. All households are by and large more likely to be headed by a male than a female, but this is slightly less common among the poor and the bottom 40. For instance, for the top 60 the share of households headed by males is 84%, while for less affluent bottom 40 this share goes down to 80%. Along the poverty status division the gap is similar in magnitude, although slightly smaller. Similarly, across all the groups considered, household heads tend to be older. Findings in Table 4 demonstrate that households in the bottom 40 percent are slightly more likely to be headed by an individual in the age group of 35-44 and 65+, compared to those in the top 60 percent, but differences are not substantive. Along the poverty divide, the pattern is somehow similar, but again, differences are small.

The poor and bottom 40 groups have more children and fewer working age adults. Shares for children (0-16) are around 20 percentage points for the bottom 40 and poor, while for their more affluent counterparts these shares are around 15 percentage points. Conversely, poor and bottom 40 have shares around 51 percent for population between 25 and 54, while these share for the non-poor and top 60 are over 56 percent. For the youth (17-24) and elderly (65+), differences are small and most likely within intervals of confidence. These results highlight the fact that there is less working age population among the disadvantaged groups, while the burden that maintaining children represents is also higher for these groups.

Education levels of the household heads are considerably lower among the poor and bottom 40. Poor and bottom 40 households are significantly more likely to be headed by someone with primary or no education. In fact, the gap between the bottom 40 percent and the top 60 percent is over 30 percentage points. For the poor the pattern is very similar, with a gap that stands at 27 percentage points. This results point at the fact that the set of human capital assets poor and bottom 40 families have to improve their living conditions are actually limited. Even before entering to compete in the labor market, they start with a clear disadvantage for their income earning prospects, particularly given the high rates of return to tertiary education prevalent in FYR Macedonia (Arias et al., 2014).

Overall, the less well-off population has less education. Results from Table 5 indicate that educational attainment is considerably higher in the top 60 and non-poor group than in their counterparts. People with only primary education are the most prevalent group among the poor and bottom 40, while for the non-poor and top 60 secondary education is the most prevalent category. Moreover, tertiary education attainment is more than fivefold higher among the more affluent groups than in the bottom 40 and poor groups.

Access to health services is more constrained for the poor and bottom 40 percent. For the analysis of access to health services, we defined unmet medical need as the case when there has been a real need for medical examination or treatment in the last 12 months, but the person has not visited a doctor. Following this definition, both poor households and those in the bottom 40 percent are more likely to have a head with an unmet medical need (at around 25% compared to 15% for the better off). While this result is an equilibrium outcome, and hence is hard to distinguish whether is because of supply or demand reasons that the medical need has not been met, it still signals clearly that poor and bottom 40 families have more difficulties to deal with negative situations, as a health negative shock.

Labor market attachment is significantly weaker for household heads among the less well-off. Poor and bottom 40 households are less likely to have heads currently working, either as employed or self-employed. The gap, though, is considerably higher for waged employment, which is consistent with the low levels of accumulated human capital heads of these households possess. Unemployment and inactivity, particularly the

former, are prevalent among the poor and bottom 40 percent, reaching both together around half of the household heads of these groups: 47% and 57% are either inactive or unemployed – excluding retirees- among these groups. The share of retired heads is lower among the poor and bottom 40 households, consistent with the lower levels of employment and lower levels of waged employment among these groups.

Table 4: Household Head Characteristics by Poverty and Bottom 40% Status (2011)

| | All | Bottom 40% | Top 60% | Poor | Non Poor |
|---------------------------------------|------|------------|---------|------|----------|
| Household Head Characteristics | | | | | |
| Gender | | | | | |
| Male | 82.5 | 79.7 | 84.4 | 80.6 | 83.2 |
| Female | 17.5 | 20.3 | 15.7 | 19.4 | 16.8 |
| Age | | | | | |
| 17-24 | 0.3 | 0.5 | 0.1 | 0.7 | 0.1 |
| 25-34 | 3.1 | 3.2 | 3.0 | 3.1 | 3.1 |
| 35-44 | 12.5 | 14.3 | 11.3 | 14.7 | 11.6 |
| 45-54 | 24.8 | 23.6 | 25.6 | 25.8 | 24.5 |
| 55-64 | 27.6 | 25.8 | 28.7 | 26.9 | 27.8 |
| 65+ | 31.7 | 32.5 | 31.3 | 28.8 | 32.9 |
| Marital Status | | | | | |
| Never married | 2.3 | 2.2 | 2.4 | 2.5 | 2.3 |
| Married | 75.2 | 73.6 | 76.2 | 75.4 | 75.1 |
| Widowed | 20.0 | 22.5 | 18.4 | 20.2 | 20.0 |
| Divorced | 2.4 | 1.8 | 2.9 | 1.8 | 2.7 |
| Education (17+) | | | | | |
| Primary or less | 43.7 | 62.3 | 31.2 | 63.4 | 36.2 |
| Secondary | 39.3 | 27.9 | 46.9 | 26.2 | 44.2 |
| Tertiary | 13.2 | 2.7 | 20.1 | 2.4 | 17.2 |
| Unknown | 3.9 | 7.1 | 1.8 | 8.0 | 2.4 |
| Employment Status (17+) | | | | | |
| Employee | 26.7 | 13.5 | 35.5 | 9.2 | 33.4 |
| Self-employed | 12.3 | 11.2 | 13.1 | 10.2 | 13.2 |
| Unemployed | 17.2 | 30.7 | 8.2 | 39.3 | 8.8 |
| Retired | 34.4 | 28.2 | 38.5 | 23.3 | 38.6 |
| Inactive | 9.3 | 16.4 | 4.6 | 18.1 | 6.0 |
| Health | | | | | |
| Unmet medical need | 18.4 | 23.1 | 15.2 | 25.4 | 15.7 |

Source: World Bank staff estimates based on SILC 2011.

Table 5: Individual Characteristics by Poverty and Bottom 40% Status (2011)

| | All | Bottom 40% | Top 60% | Poor | Non Poor |
|------------------------------------|------|------------|---------|------|----------|
| Individuals Characteristics | | | | | |
| Gender | | | | | |
| Male | 50.6 | 49.3 | 51.5 | 49.5 | 51.1 |
| Female | 49.4 | 50.7 | 48.5 | 50.6 | 48.9 |
| Age | | | | | |
| 0-16 | 16.9 | 19.8 | 14.9 | 20.9 | 15.3 |

| | | | | | |
|--------------------------------|------|------|------|------|------|
| 17-24 | 13.5 | 14.5 | 12.8 | 14.6 | 13.1 |
| 25-64 | 54.7 | 50.8 | 57.3 | 51.0 | 56.1 |
| 65+ | 15.0 | 14.9 | 15.0 | 13.5 | 15.5 |
| Marital Status (17+) | | | | | |
| Never married | 20.8 | 19.1 | 21.8 | 18.9 | 21.5 |
| Married | 68.5 | 68.9 | 68.3 | 69.9 | 68.0 |
| Widowed | 9.3 | 10.8 | 8.4 | 10.0 | 9.1 |
| Divorced | 1.4 | 1.2 | 1.5 | 1.3 | 1.5 |
| Education (17+) | | | | | |
| Primary or less | 39.3 | 57.3 | 28.0 | 59.9 | 31.8 |
| Secondary | 44.3 | 32.5 | 51.6 | 29.6 | 49.7 |
| Tertiary | 12.8 | 3.6 | 18.6 | 3.4 | 16.3 |
| Unknown | 3.6 | 6.5 | 1.8 | 7.2 | 2.3 |
| Employment Status (17+) | | | | | |
| Employee | 27.0 | 10.9 | 37.1 | 7.8 | 34.1 |
| Self-employed | 10.2 | 9.4 | 10.8 | 8.2 | 11.0 |
| Unemployed | 21.1 | 33.1 | 13.5 | 38.2 | 14.8 |
| Retired | 17.1 | 12.1 | 20.3 | 9.8 | 19.8 |
| Inactive | 24.4 | 34.4 | 18.2 | 36.0 | 20.2 |

Source: World Bank staff estimates based on SILC 2011.

Less employment and higher inactivity rates prevail across the poor and bottom 40 population. Employment rates are considerably higher for the top 60 and non-poor, driven mainly by the differences in waged employment (Table 5). Unemployment is considerably higher for the bottom 40 and poor, as well as inactivity. Somehow surprising, the share of population retired is higher among the more affluent groups, possibly indicating some effect pensions have on keeping households out of poverty, by contributing to the income of these households.

3.2. Multivariate Analysis

To complement the descriptive analysis, we estimate regressions of poverty and bottom 40 percent status on households' socio demographic characteristics. We report the marginal effects on the probabilities of belonging to each category, after running probit regressions on a bivariate variable representing each category. The variables included for this analysis are the socio demographic characteristics described in the previous section, plus complementary variables related to the composition of the household. (See Appendix)

Among the household head characteristics, education and labor market status have the biggest effects on the probabilities of belonging to the poor or bottom 40. Moving from an education level of Primary or less to Secondary reduces probabilities of being poor by around 13 percentage points, while moving one step further up to Higher education has an impact almost double in magnitude. These results confirm what it was previously discussed about the low level of human capital for less affluent groups, and the role they play for poverty and bottom 40 statuses. Unsurprisingly, labor market outcomes are also associated with these statuses and the magnitude of the effects after controlling by levels of education are still considerable. While being self-employed has a small impact with respect to being waged employed, moving to unemployment or inactivity increases probabilities considerably, by more than 35 and 40 percentage points for poor and bottom 40 respectively. All these signals that in order to maximize the effect of policies to reduce poverty and boost shared

prosperity is not enough to increase the level of human capital of the working force, but also to implement policies that will help them join the active working force and ultimately to find decent jobs.

Other household head characteristics play a minor role. The effect of household head age is quite irregular. While young household heads are more likely to belong to the poor and bottom 40 groups, for the rest the effect has a U-shape, with the bottom of the curve reached at the working prime age (45-44 for poverty and 35-44 for bottom 40%). Still, differences across age groups are not significant. Marital status or gender do not show any statistical significance.

Household characteristics like household size, the number of children between 0 and 14 years old, overcrowding, location (as proxied by the type of dwelling) and access to services are associated with poverty and belonging to the bottom 40. The household size has, counterintuitively, a negative effect on chances of being poor or bottom 40, while more children in the household increases the probabilities of being bottom 40 or poor. This suggests that is not the household size alone that matters, but more likely the share of members of non-working age in the household. Overcrowding is also associated with a higher probability of being in poverty and bottom 40, while, not surprisingly, access to services is associated with a reduction in the chances of falling on any of both categories. The type of dwelling is also associated with poverty and bottom 40 status. Most likely this result is capturing the effect of living in urban areas, and in modern buildings, as opposed to the predominantly detached houses in rural areas. All the other variables included in the regressions presented in Table A1 show an inconsistent or not statistically significant effect.

3.3.Sources of Income

Consistent with previous results, poor households and those in the bottom 40 percent are significantly less likely to generate income from wage employment than the non-poor and the top 60 percent. As Figure 2 shows, for instance, labor income as a source of income makes up over 50 percent of the income for the non-poor and the top 60 percent, significantly higher than the poor and the bottom 40 percent shares (at 23 and 29 percent, respectively). Self-employment, on the other hand, has similar shares across poverty and bottom 40 divides, in all cases oscillating between 15 percent and 16 percent of household income. All these results highlight again the difference in labor market outcomes across groups.

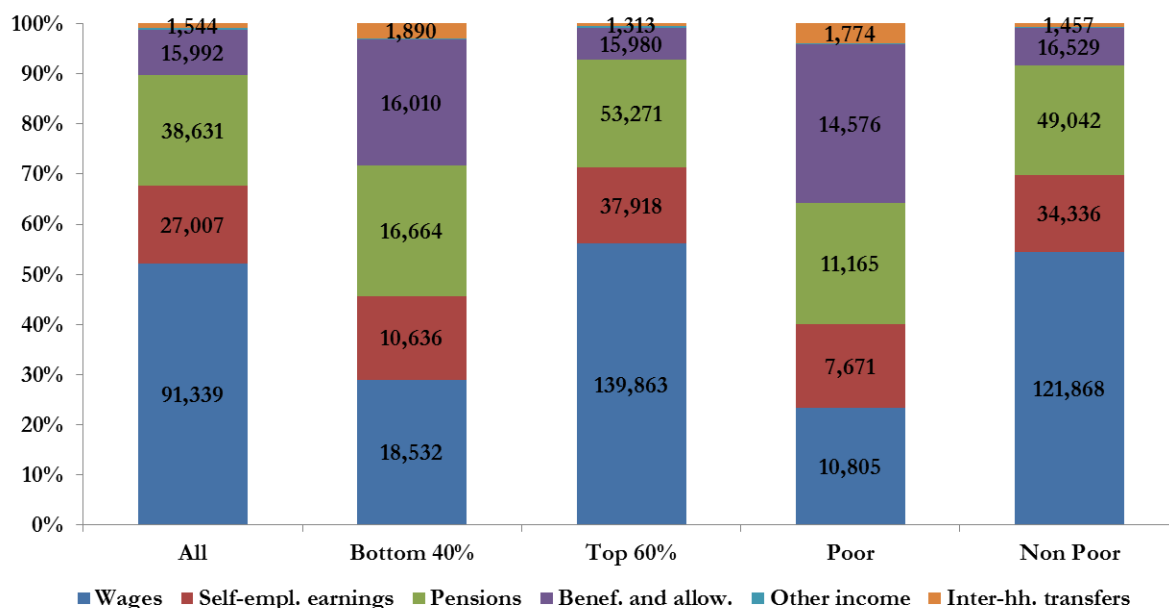
A quarter of the bottom 40 percent and over 30 percent of all poor households' income was generated from benefits and allowances, a significantly higher share than for the non-poor and the top 60 percent. Benefits and allowances group several different types of social protection transfers, excluding pensions, as are last –resort social assistance programs; survivor, sickness and disability benefits; and education, children and other social allowances. While the national average income coming from benefits and allowances was at 9 percent, for the bottom 40 and the poor this share increases to 25 percent and 32 percent, providing information on targeting of these benefits, but also pointing to large reliance in this source of income for these groups. However, as Figure 2 shows, the absolute average values of the benefits and allowances are not that different across groups, in all cases between 14,000 and 16,000 denars per year⁷. This shows that although social protection is higher as a relative source of income for some, it is still small in absolute terms.

Poor households and the bottom 40 percent are more likely to have income from pensions and inter-household transfers compared the non-poor and the top 60 percent. For income coming from pensions,

⁷ At an exchange rate of 44.2 denars per dollar (WDI), this translates into 315-360 dollars per year.

the shares show some differences of around 5 percentage points in favor of the less affluent groups, across the poor and bottom divides. Inter-household transfers, which includes regular inter-household cash transfer (including remittances) and alimonies (compulsory and voluntary), represent a small share of the income, but still are more important for poor and bottom 40 than their counterparts.

Figure 2: Income Components by Poverty and Bottom 40% Status (2011)



Source: World Bank staff estimates based on SILC 2011. Numbers in bars are denars per year.

4. Benchmark with Other Countries

This section compares FYR Macedonia and regional peers focused on indicators of poverty and the components of the AROPE indicator. The comparison is restricted to countries with comparable welfare aggregates, which limits the sample to EU countries and Bosnia and Herzegovina, for which these estimates are also available for 2011 (World Bank, 2014b). Results for EU countries are reported for 2010 for the sake of comparability, as the extensive analysis of AROPE components in FYR Macedonia for this note was also performed using data from that year.

4.1. Poverty across Countries

FYR Macedonia ranks significantly low in its share of population at-risk-of-poverty (60% of median) (Figure 3). For 2010, this share amounted to 27.0 percent for FYR Macedonia, while the average for the country member of the EU (EU28) registered 17 percent, significantly lower. Only Bosnia and Herzegovina gets close to this level, by registering 26.5 percent below the 60% of the median in 2011. Given that this measure is relative in nature, it captures higher inequality in income in these two countries, as opposed to reflecting purely a lower level of development compared to EU28 countries.

4.2.AROPE across Countries

As part of the Europe 2020 strategy, Eurostat follows three components that compose the **At-Risk-of-Poverty and Social Exclusion indicator** (European Commission, 2013). AROPE refers to the situation of people for whom at least one of the following definitions applies:

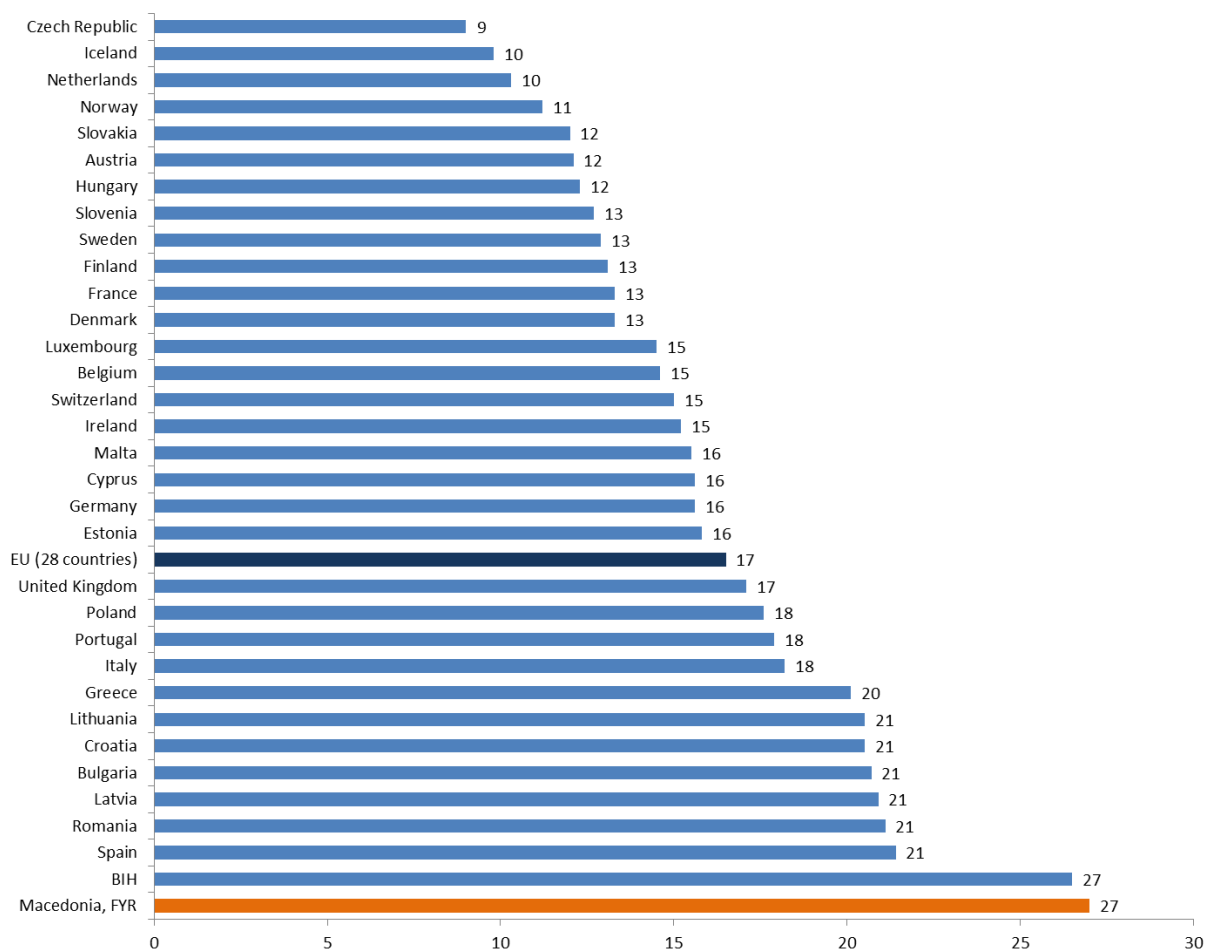
- 1) At-risk-of-poverty: the share of people with an equalized disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60 % of the national median equalized disposable income after social transfers.
- 2) Severely materially deprived (SMD): the percentage of the population that cannot afford at least four of the following nine items: (i) to pay their rent, mortgage or utility bills; (ii) to keep their home adequately warm; (iii) to face unexpected expenses; (iv) to eat meat or proteins regularly; (v) to go on holiday; (vi) a television set; (vii) a washing machine; (viii) a car; (ix) a telephone.
- 3) Living in a household with a very low work intensity (VLWI): the number of persons living in a household having a work intensity below a threshold set at 0.20, where the work intensity of a household is the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period (a working-age person is a person aged 18-59 years, with the exclusion of students in the age group between 18 and 24 years). Households composed only of children, of students aged less than 25 and/or people aged 60 or more are completely excluded from the indicator calculation.

Since the implementation of the SILC survey in 2010, FYR Macedonia SSO has also started tracking and reporting these results.

Close to 45% of FYR Macedonia's population is deprived in at least one of the three AROPE components⁸. Table 6 showcases the share of population by AROPE components. The share of population below 60 percent of the median income is 27.2, while more than a quarter of the FYR Macedonian population is severely materially deprived. About a quarter of the population lives in a household with very-low work intensity.

Figure 3: Share of Population At-Risk-of-Poverty by EU countries (2010)

⁸ For this report, we recreated AROPE estimates obtained by Macedonia SSO, obtaining slightly different estimates due to methodological differences, that still capture by large the populations of interest as to validate the analysis presented next. The main difference is one of the components of the severe material deprivation indicator. We used only arrears in rent. Macedonia SSO reports this indicator including arrears on mortgage or rent payments, utility bills, hire purchase installments or other loan payments, leading to a higher severe material deprivation rate. Rates reported by the SSO are: Combined AROPE: 47.4, Below 60% Median Income: 27.3, SMD: 35.1, and VLWI: 23.2 (FYR Macedonia SSO, 2013).



Source: Eurostat. For FYR Macedonia, World Bank staff calculations based on 2010 SILC data. For BIH, World Bank (2014b).

Table 6: Replication of AROPE Indicator and Components (2010)

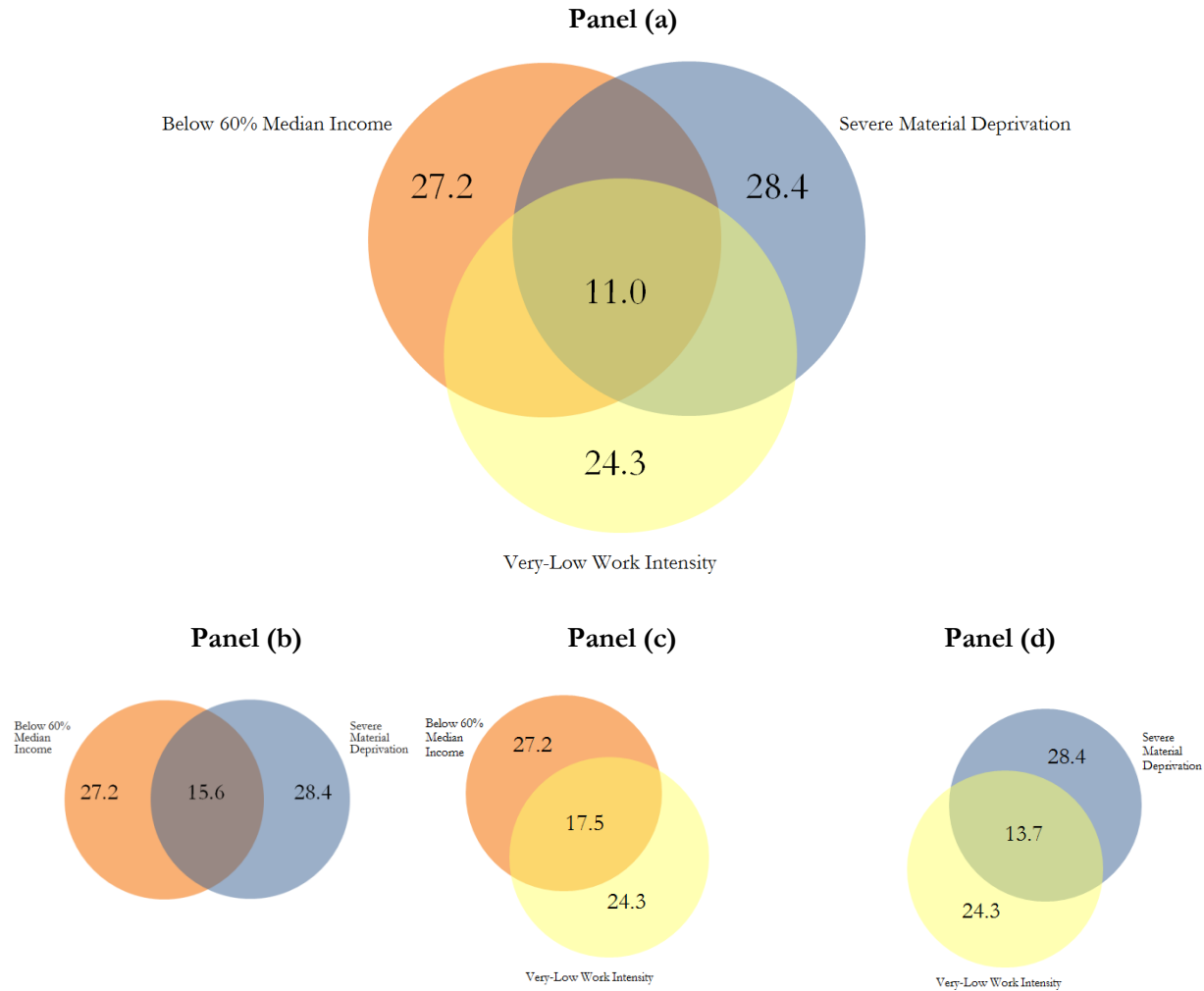
| | 2010 |
|---|------|
| Combined AROPE indicator (at least one component) | 44.7 |
| Below 60% Median Income | 27.2 |
| Severe Material Deprivation (SMD) | 28.4 |
| Very-Low Work Intensity (VLWI) | 24.3 |
| All three components (simultaneously) | 11.0 |

Source: World Bank staff estimates based on SILC 2010. See footnote 7.

There is considerable overlap between the three components of the AROPE indicator, accounting for roughly half of each of the groups identified. (Figure 4) Analyzing the interactions between the different components can be instructive to characterize the profile of poverty and exclusion in FYR Macedonia. This analysis indicates, first, that low labor market attachment at the household level is associated with both income-

and assets-based poverty. Also, it indicates that chronic poor households (income- and asset-poor) are actually a significant share of the Macedonian population (16%). Finally, around one of eight people in FYR Macedonia can be considered vulnerable, as they have income above the poverty line but do not have an adequate standard of living, as signaled by the Severe Material Deprivation indicator.

Figure 4: FYR Macedonia Replicated AROPE Components Overlap (2010)

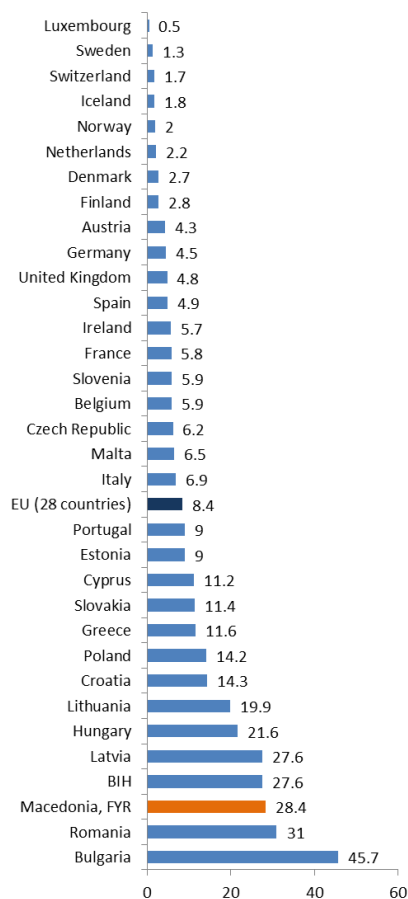


Note: Figures in the intersections represent share of population that jointly own the characteristics of the intersecting circles, in percentage points. Figures outside the intersection represent shares of population with one single characteristic. Circles sizes are only referential.

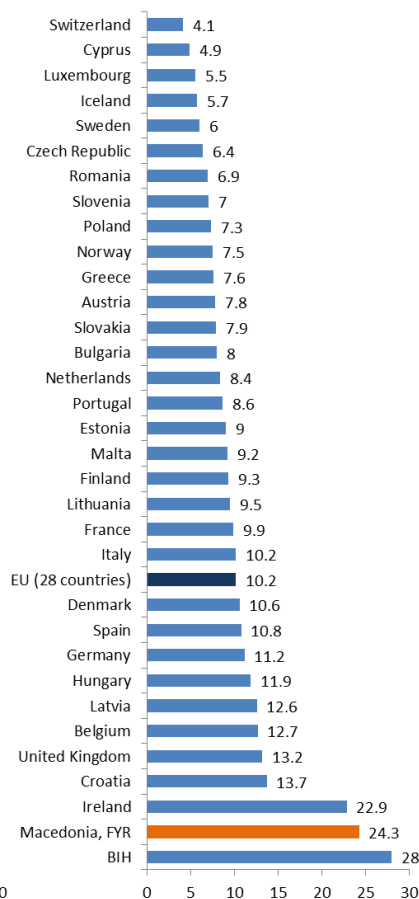
Source: World Bank staff estimates based on SILC 2010.

Figure 5: Components of AROPE and AROPE indicator across EU countries

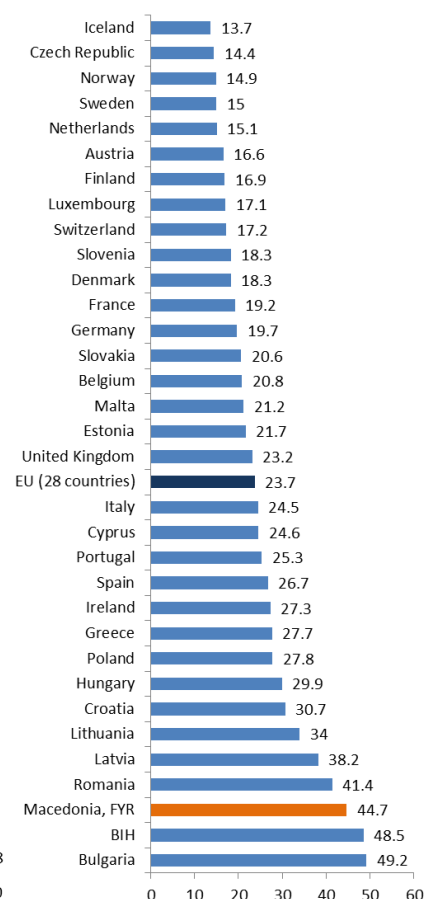
(1) Severe Material Deprivation



(2) Very-Low Work Intensity



(3) AROPE



Source: Eurostat. For FYR Macedonia, World Bank staff calculations based on 2010 SILC data. For BIH, World Bank (2014b).

FYR Macedonia ranks consistently very low when compared with the EU countries, when using the SMD, VLWI, and joint AROPE indicators (Figure 5). Macedonian share of population severely materially deprived shows as significantly higher than in most EU countries. Considering that the indicator presented here focuses on fewer categories than Eurostat does, the difference with the regional peers is expected to be actually larger (See footnote 7). The share of individuals living in households with very low work intensity is also very high in FYR Macedonia compared to EU countries, which is consistent with the reported trends of extremely weak labor market outcomes for household heads of the poor and the bottom 40 percent. In line with these two previous results, FYR Macedonia had much higher share of its population at risk of poverty or social exclusion, than many other EU countries. Looking at all three components of AROPE (population at risk of poverty, severely materially deprived, and living in a household with low work intensity), FYR Macedonia ranked among the lowest compared to all the comparing countries, except by Bosnia and Herzegovina, and Bulgaria.

4.3.AROPE and Other Poverty Lines

As countries like FYR Macedonia move to measuring poverty following EU standards, it is important to assess whether measuring poverty and social inclusion in different ways can have implications for policymaking. In other words, whether the various measures are capturing different populations, and hence, potentially identifying new priorities for policy intervention.

Most characteristics of the population identified by the 60%-of-median income poverty line are consistent with previous analyses: they have lower education, weak attachment to the labor market, more rural location, higher number of household members, higher share of children, and lower access to services. These characteristics were also identified as associated with the poor and the bottom 40 when using a consumption aggregate and the 2002 poverty line.⁹ Other characteristics identified here, such as overcrowding, are not available for comparison, and other characteristics previously listed, as ethnicity, could not be tested with the SILC data.

The AROPE indicator also captures people with lower education and weaker attachment to the labor market than the national average, consistent also with the characteristics of the less well-off previously identified. As the first two columns in Table 7 shows, across age and gender there are no considerable differences between the national shares and the AROPE shares. However, for education, the shares for primary education or less is considerably higher for the AROPE and the share for tertiary education is also considerably lower for the AROPE population. Regarding labor market outcomes, AROPE population tends to have considerably higher unemployment and higher inactivity rates than the national average.

Table 7: FYR Macedonia population distribution by AROPE and Components (2010)

| | All | AROPE | At-Risk-of-Poverty | Severe Material Deprivation | Very-Low Work Intensity |
|---------------------------|-------|-------|--------------------|-----------------------------|-------------------------|
| Age groups | | | | | |
| 0-16 | 15.4 | 16.0 | 18.1 | 15.3 | 17.3 |
| 17-24 | 13.4 | 13.6 | 14.8 | 14.0 | 12.6 |
| 25-34 | 12.7 | 11.3 | 10.7 | 10.9 | 12.6 |
| 35-44 | 12.4 | 12.0 | 13.1 | 12.0 | 13.3 |
| 45-54 | 15.2 | 14.5 | 14.6 | 15.2 | 14.6 |
| 55-64 | 14.9 | 16.5 | 14.3 | 15.9 | 18.8 |
| 65+ | 16.0 | 16.1 | 14.5 | 16.7 | 10.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Gender | | | | | |
| Male | 51.0 | 51.0 | 50.3 | 51.6 | 51.5 |
| Female | 49.1 | 49.0 | 49.7 | 48.4 | 48.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Education | | | | | |
| Primary or less | 35.8 | 45.9 | 48.6 | 47.8 | 45.0 |
| Secondary | 36.8 | 31.6 | 27.8 | 30.6 | 30.5 |
| Tertiary | 10.0 | 3.9 | 2.4 | 3.7 | 4.5 |
| Unknown | 17.5 | 18.6 | 21.3 | 18.0 | 20.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Labor Force Status | | | | | |
| Employee | 20.9 | 10.5 | 5.7 | 13.0 | 2.4 |
| Self-employed | 7.6 | 5.2 | 5.0 | 4.8 | 1.1 |
| Unemployed | 18.0 | 26.9 | 31.9 | 27.1 | 37.9 |

⁹ 2009 FYR Macedonia Poverty Assessment (World Bank, 2009) and the SEE Economic Report 5 (World Bank, 2014a).

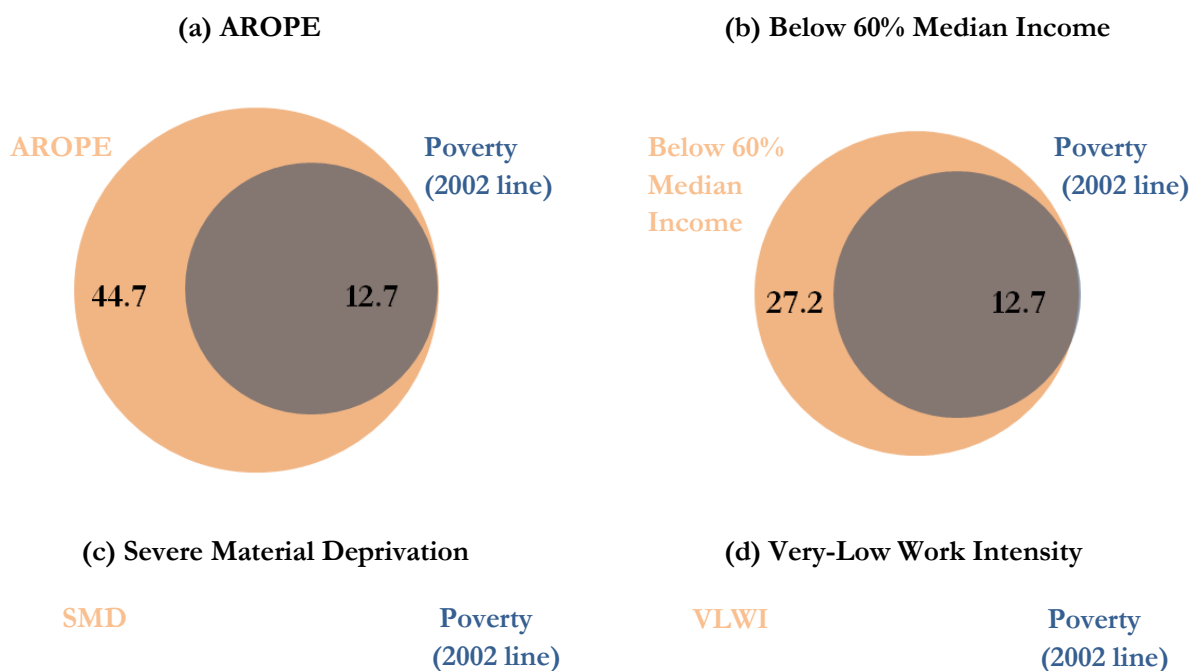
| | | | | | |
|----------|-------|-------|-------|-------|-------|
| Retired | 13.8 | 12.9 | 8.4 | 12.3 | 11.9 |
| Inactive | 22.8 | 26.8 | 29.0 | 25.8 | 27.6 |
| Unknown | 16.9 | 17.7 | 20.0 | 17.0 | 19.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

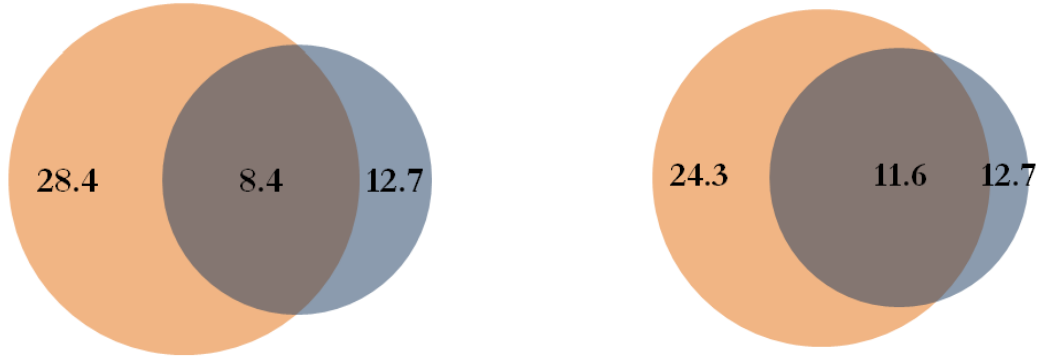
Source: World Bank staff estimates based on SILC 2010.

The profile of the population captured by the different components of the AROPE (severe material deprivation, very low work intensity and at-risk-of poverty) is very similar, except in labor market outcomes. It is no surprise that among the very-low work intensity, the employed represent a substantially lower share than for the other components, registering barely 3.5%. The unemployed are also overrepresented in this group. For the other characteristics listed, as are age, gender and education, the patterns are quite consistent across components.

The AROPE indicator captures all the poor as defined by 2002 absolute Poverty Line, explained mainly by the complete overlap with the income-based poverty component (Figure 6, Panel (b)). For the SMD and VLWI (Figure 6, Panels (c) and (d)), the overlap is also considerable, capturing two thirds and more than 90% of the 2002-Poverty-line poor. This result is consistent with the previously reported overlap among the three components of the AROPE indicator, highlighting the fact that income poor in FYR Macedonia are also poor along other dimensions. However, from the point of view of the poor by the 2002 Poverty Line, the largest discrepancy is with respect to SMD, where close to one third is not captured. For VLWI the discrepancy is minimal.

Figure 6: Overlapping of AROPE and Components with 2002 Absolute Poverty Line



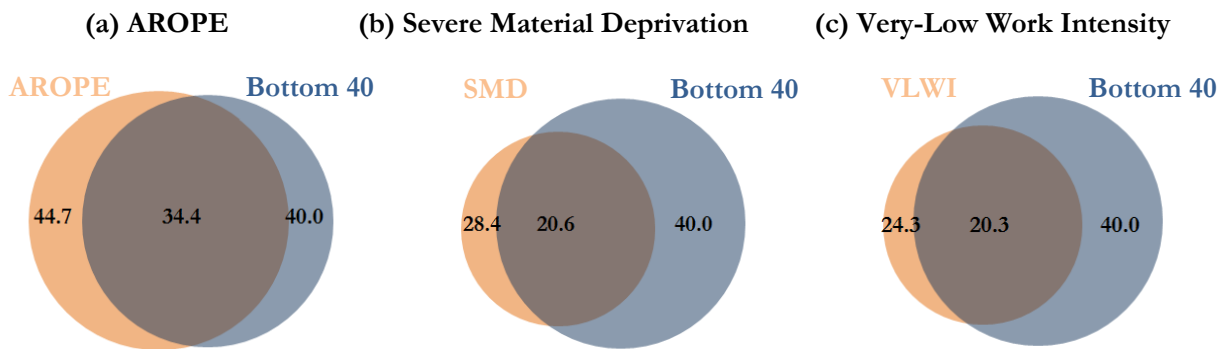


Note: Figures in the intersections represent share of population with the characteristics represented by the circles, in percentage points. Figures outside the intersection represent shares of population with one single characteristic. Circles sizes are only referential.

Source: World Bank staff estimates based on SILC 2010.

The AROPE indicator overlaps considerably with the bottom 40 percent of the distribution, driven by the overlap across all three components (Figure 7). The overlap with the income-poverty component is, naturally, complete, and omitted from the graphs. For the SMD and VLWI, (Figure 7, Panels (b) and (c)) the overlap is considerable, and leaves only small portions of the population identified as AROPE out of the bottom 40 percent. However, from the point of the bottom 40 percent, around half of them are not identified either by the SMD or the VLWI. The highest overlap comes with respect to the income-based poverty component (27.2), but it still does not capture more than a quarter of the bottom 40. It is only after aggregating the three components into the composed AROPE indicator that more than 80% of the bottom 40 is identified as AROPE (See Table 11 for additional statistics on overlapping among definitions).

Figure 7: Overlapping of AROPE and Components with Bottom 40%



Note: Figures in the intersections represent share of population with the characteristics represented by the circles, in percentage points. Figures outside the intersection represent shares of population with one single characteristic. Circles sizes are only referential.

Source: World Bank staff estimates based on SILC 2010.

5. Conclusions

This poverty note deepens the analysis of the latest poverty and income distribution information available reported by FYR Macedonia SSO, corresponding to the years 2010, 2011 and 2012. Using the available micro data for 2010 and 2011, results show that poor and bottom 40 households tend to have more children, are more rural, and have less access to public services. Most importantly, these household also are headed by persons with lower education and with considerable worse labor market outcomes than their more affluent counterparts (lower employment rates and higher unemployment and inactivity rates). Consistent with this result, bottom 40 and poor households rely considerably less in labor earnings as a source of income, and considerably more in social protection transfers.

Most characteristics of the population identified by the new official relative poverty line (60%-of-median income) are consistent with the previously identified characteristics for the less well-off. Among these characteristics are low education, weak attachment to the labor market, more rural location, higher number of household members, higher share of children, and lower access to services. At the same time, analysis shows that the AROPE indicator captures all the poor as defined by the 2002 absolute poverty line, which is explained mainly by the complete overlap with the income-poor component. In other words, monetary measures of poverty are not fully capturing households with deprivations in other areas. Finally, the AROPE indicator overlaps considerably with the bottom 40 percent of the distribution. This result is driven by the accumulative effect of overlaps between all three components and the bottom 40 percent, although for one-on-one comparisons between the bottom 40 and the three components, still considerable shares of the bottom 40 are not captured. Compared with EU28 countries, FYR Macedonia still lags behinds in the three components of the newly introduced poverty measure, the At-Risk-of-Poverty and Social Exclusion (AROPE) indicator.

The low accumulated human capital and disappointing labor market outcomes for the less well-off call for policies oriented to increase their educational attainment and strengthen their attachment to the labor market. Given the current low level of assets accumulated by the poor and the bottom 40, which affects not only the heads but the entire working age population of these groups, is critical to promote policies that can help these groups to increase their human capital. At the same time, as results from the multivariate regression show, once education is accounted for, there is still a considerable effect of labor market status of the household head to escape poverty and move up in the income distribution. This result calls for complementary policies in the labor market to boost labor demand, and that can smooth transitions though unemployment and facilitate incorporations and re-incorporations in the active labor force. For example, public transfer – a more important share of income for the less well-off - could potentially be a source of work disincentives for many if not well targeted and designed. In fact, related research has found a high implicit tax rate in FYR Macedonia for individuals to move from unemployment or inactivity, into formal work. These disincentives result from a combination of social protection benefits that are given up and income taxes with which individuals are faced when joining the formal labor market (Arias et al, 2014). Exploring the role of pensions in creating disincentives but also in combating old-age poverty is also important to inform the policy agenda on pension reform.

As the country now relies in an income-based measure to track poverty, is important to consider the differences with the previous estimates based on consumption, especially given the characteristics of the country. As discussed before, characteristics of the Macedonian economy such as high informality and reliance on farming income for poor rural households can induce biases in the welfare aggregates estimates that

can result in not capturing entirely changes in welfare. If this is the case, the new poverty estimates may end up not capturing entirely transitions in and out of poverty. Efforts to better understand this potential bias, and adjust and improve the survey collection methodologies in order to capture as accurately as possible income from those groups, are then more than justified.

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Appendix

Table A1: Correlates of Poverty and Bottom 40% Status (2011)

| | Poverty Status (1) | Bottom 40% (2) |
|---|-----------------------|-------------------|
| HH Head Female | 0.014 | 0.035 |
| HH Head Age | | |
| 17-24 (Base) | | |
| 25-34 | -0.286** | -0.287*** |
| 35-44 | -0.214* | -0.237** |
| 45-54 | -0.209* | -0.28*** |
| 55-64 | -0.269** | -0.334*** |
| 65+ | -0.324*** | -0.417*** |
| HH Head Marital Status | | |
| Never married (Base) | | |
| Married | -0.006 | 0.048 |
| Widowed | -0.099** | -0.039 |
| Divorced | -0.094* | -0.075 |
| HH Head Education | | |
| Primary or less (Base) | | |
| Secondary | -0.132*** | -0.197*** |
| Tertiary | -0.225*** | -0.349*** |
| HH Head Employment Status | | |
| Employee (Base) | | |
| Self-employed | 0.044** | 0.048** |
| Unemployed | 0.423*** | 0.411*** |
| Retired | 0.124*** | 0.119*** |
| Inactive | 0.373*** | 0.355*** |
| HH Head with unmet medical need | 0.03* | 0.014 |
| HH Size | -0.022*** | -0.029*** |
| Share children 0-14 yo | 0.195*** | 0.135** |
| Share adults 65+ yo | 0.027 | 0.11*** |
| HH Dwelling type | | |
| Detached house (Base) | | |
| Semi-detached house / Terrace | -0.04** | -0.015 |
| Apartment / flat in bldg. <10 dwellings | -0.076 | -0.136*** |
| Apartment / flat in bldg. 10+ dwellings | -0.106*** | -0.15*** |
| Other | -0.018 | 0.033 |
| HH Members / # rooms | 0.074*** | 0.101*** |
| HH has flush toilet /shared | -0.153*** | -0.166*** |

Note: Marginal effects from probit regressions reported.

Source: World Bank staff estimates based on SILC 2011.

Table A2: Population distribution by AROPE, Components and Poverty Definitions (2010)

(a) Across AROPE and Components

| | 60% median | | 2002 Poverty Line | | \$5 a day | | \$2.5 a day | | Top 60% | Bottom 40% |
|--------------------------------|------------|-------|-------------------|-------|-----------|-------|-------------|-------|---------|------------|
| | Non-poor | Poor | Non-poor | Poor | Non-poor | Poor | Non-poor | Poor | | |
| No AROPE | 76.0 | 0.0 | 63.1 | 0.0 | 64.7 | 0.0 | 59.4 | 0.0 | 82.2 | 17.3 |
| AROPE | 24.0 | 100.0 | 36.9 | 100.0 | 35.3 | 100.0 | 40.6 | 100.0 | 17.8 | 82.7 |
| Above 60% median income | 100.0 | 0.0 | 83.0 | 0.0 | 85.1 | 0.0 | 78.2 | 0.0 | 100.0 | 34.0 |
| Below 60% median income | 0.0 | 100.0 | 17.0 | 100.0 | 14.9 | 100.0 | 21.8 | 100.0 | 0.0 | 66.0 |
| No Severe Material Deprivation | 81.8 | 45.0 | 77.1 | 34.4 | 77.9 | 35.9 | 74.9 | 30.3 | 86.6 | 50.9 |
| Severe Material Deprivation | 18.2 | 55.0 | 22.9 | 65.6 | 22.1 | 64.1 | 25.1 | 69.7 | 13.4 | 49.1 |
| No Very-Low Work Intensity | 90.2 | 37.4 | 85.2 | 13.4 | 86.6 | 15.8 | 81.2 | 9.5 | 93.2 | 50.6 |
| Very-Low Work Intensity | 9.8 | 62.6 | 14.8 | 86.6 | 13.4 | 84.2 | 18.8 | 90.5 | 6.8 | 49.4 |

(b) Across Poverty Definitions

| | 60% median | | 2002 Poverty Line | | \$5 a day | | \$2.5 a day | | Top 60% | Bottom 40% |
|--------------------------------|------------|-------|-------------------|------|-----------|------|-------------|------|---------|------------|
| | Non-poor | Poor | Non-poor | Poor | Non-poor | Poor | Non-poor | Poor | | |
| No AROPE | 100.0 | 0.0 | 100.0 | 0.0 | 100.0 | 0.0 | 100.0 | 0.0 | 86.9 | 13.1 |
| AROPE | 38.6 | 61.4 | 71.6 | 28.4 | 66.8 | 33.2 | 83.7 | 16.3 | 23.1 | 76.9 |
| Above 60% median income | 100.0 | 0.0 | 100.0 | 0.0 | 100.0 | 0.0 | 100.0 | 0.0 | 80.4 | 19.6 |
| Below 60% median income | 0.0 | 100.0 | 53.7 | 46.4 | 45.9 | 54.1 | 73.4 | 26.6 | 0.0 | 100.0 |
| No Severe Material Deprivation | 82.7 | 17.3 | 93.9 | 6.1 | 92.5 | 7.5 | 96.9 | 3.1 | 70.4 | 29.6 |
| Severe Material Deprivation | 46.5 | 53.5 | 70.5 | 29.5 | 66.2 | 33.8 | 82.0 | 18.0 | 27.6 | 72.4 |
| No Very-Low Work Intensity | 86.3 | 13.7 | 97.6 | 2.4 | 96.8 | 3.3 | 99.0 | 1.0 | 72.3 | 27.7 |
| Very-Low Work Intensity | 29.0 | 71.0 | 52.4 | 47.6 | 46.2 | 53.8 | 71.0 | 29.0 | 16.3 | 83.7 |

Source: World Bank staff estimates based on SILC 2011.

Table A3: Household Characteristics SILC 2010

| | Bottom 40% | Top 60% |
|---|------------|---------|
| Size | | |
| 1 | 4.8 | 13.6 |
| 2 | 17.3 | 20.3 |
| 3 | 13.7 | 20.4 |
| 4 | 26.5 | 29.3 |
| 5 | 17.0 | 10.4 |
| 6+ | 20.7 | 6.1 |
| Dwelling type | | |
| Detached house | 75.4 | 54.4 |
| Semi-detached house / Terrace | 10.0 | 10.4 |
| Apartment / flat in bldg. <10 dwellings | 1.2 | 4.2 |
| Apartment / flat in bldg. 10+ dwellings | 13.3 | 30.8 |
| Other | 0.2 | 0.3 |
| Tenure status | | |
| Owner | 88.9 | 90.6 |
| Tenant / sub-tenant (market price rent) | 0.4 | 2.1 |
| Tenant / sub-tenant (reduced rent) | 0.7 | 0.5 |
| Free | 10.1 | 6.8 |
| Dwelling quality | | |
| Roof leaking | 28.2 | 18.5 |
| Access to services | | |
| Flush toilet in unit | 78.5 | 93.2 |
| Rooms | | |
| 1 | 1.1 | 2.3 |
| 2 | 34.1 | 30.6 |
| 3 | 30.6 | 32.1 |
| 4 | 22.7 | 21.8 |
| 5+ | 11.4 | 13.3 |
| Over-crowding | | |
| Mean ratio (hh size/rooms) | 1.5 | 1.1 |
| Share ratio>2 | 17.3 | 5.0 |
| Share ratio>3 | 3.3 | 1.5 |

Table A4: Household Head Characteristics SILC 2010

| | SILC 2010 | |
|--------------------------|------------------|-------------------|
| | Top 60% | Bottom 40% |
| Education | | |
| Primary or less | 28.5 | 54.9 |
| Secondary | 45.3 | 36.4 |
| Tertiary | 23.7 | 3.0 |
| Unknown | 2.4 | 5.6 |
| Employment Status | | |
| Employee | 40.9 | 20.5 |
| Self-employed | 12.2 | 12.0 |
| Unemployed | 7.5 | 33.5 |
| Retired | 31.6 | 21.5 |
| Inactive | 7.8 | 12.6 |
| Health | | |
| Unmet medical need | 16.3 | 25.6 |
| Gender | | |
| Male | 78.1 | 84.0 |
| Female | 21.9 | 16.0 |
| Age | | |
| 17-24 | 0.4 | 0.1 |
| 25-34 | 4.6 | 3.8 |
| 35-44 | 14.0 | 20.8 |
| 45-54 | 27.3 | 27.0 |
| 55-64 | 25.0 | 24.8 |
| 65+ | 28.8 | 23.6 |
| Marital Status | | |
| Never married | 3.6 | 0.9 |
| Married | 72.0 | 80.7 |
| Widowed | 20.5 | 15.7 |
| Divorced | 4.0 | 2.6 |

Table A5: Household Head Characteristics

| | 2010 Non-poor | 2010 Poor |
|------------------------|------------------|--------------|
| Employee status | | |
| Employee | 38.4 | 13.0 |
| Self-employed | 13.0 | 8.9 |
| Unemployed | 9.6 | 47.0 |
| Retired | 30.3 | 17.9 |
| Inactive | 8.7 | 13.3 |
| Age | | |
| 17-24 | 0.3 | 0.1 |
| 25-34 | 4.2 | 4.5 |
| 35-44 | 16.1 | 19.0 |
| 45-54 | 26.5 | 29.6 |
| 55-64 | 23.9 | 28.4 |
| 65+ | 29.1 | 18.4 |
| Gender | | |
| Male | 78.9 | 85.7 |
| Female | 21.1 | 14.3 |

Table A6: Household Characteristics 2010

| | Non-poor | Poor |
|---|----------|------|
| Size | | |
| 1 | 12.3 | 2.4 |
| 2 | 20.1 | 15.6 |
| 3 | 18.6 | 14.6 |
| 4 | 28.6 | 26.6 |
| 5 | 12.1 | 16.5 |
| 6+ | 8.4 | 24.3 |
| Dwelling type | | |
| Detached house | 58.5 | 77.7 |
| Semi-detached house / Terrace | 10.6 | 8.8 |
| Apartment / flat in bldg. <10 dwellings | 3.4 | 1.7 |
| Apartment / flat in bldg. 10+ dwellings | 27.2 | 11.7 |
| Other | 0.3 | 0.2 |
| Tenure status | | |
| Owner | 90.2 | 88.8 |
| Tenant / sub-tenant (market price rent) | 1.8 | 0.1 |
| Tenant / sub-tenant (reduced rent) | 0.5 | 0.8 |
| Free | 7.5 | 10.2 |
| Dwelling quality | | |
| Roof leaking | 19.4 | 32.8 |
| Access to services | | |
| Flush toilet in unit | 90.8 | 75.4 |
| Rooms | | |
| 1 | 2.1 | 0.9 |
| 2 | 30.9 | 35.6 |
| 3 | 32.4 | 28.3 |
| 4 | 21.7 | 23.7 |
| 5+ | 12.8 | 11.4 |
| Over-crowding | | |
| Mean ratio (hh size/rooms) | 1.2 | 1.6 |
| Share ratio>2 | 6.5 | 21.8 |
| Share ratio>3 | 1.5 | 4.8 |