Welfare Dynamics in the Arab World: Synthetic Analysis Using Objective and Subjective Data

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Abstract

This paper provides a study of welfare dynamics for countries in the MENA region that combines both objective and subjective welfare measures. Absent actual panel data, we employ recently developed statistical techniques to construct synthetic panels using repeated cross sections from household surveys and the Gallup Poll data, which span the Arab Spring period. Our findings suggest that analysis of welfare dynamics using household surveys' expenditure data do not always align with that based on subjective wellbeing data, which points to the need to combine both type of data for richer analysis. We find that before the Arab Spring, upward mobility for objective welfare was reasonably strong for Palestine, Tunisia, and Syria, while downward mobility is larger for Yemen, Egypt, and Jordan. Life satisfaction was falling, however, in most countries during the Arab Spring transitions. Only Morocco shows positive dynamics with the size of the unhappy population declining by more than a quarter.

JEL: C15, D31, I31, O10, O57

Key words: welfare dynamics, poverty, vulnerability, satisfaction, synthetic panel, MENA

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I. Introduction

Analysis of welfare dynamics plays a crucial role in the design of development policies, particularly regarding poverty reduction. Without a clear understanding of the dynamic processes underlying poverty trends, policies can turn out to be inefficient, or even ineffective. For example, assume that the headcount poverty rate, as measured from two rounds of cross sectional household surveys, slightly decreases from 20 percent in the first period to 18 percent in the second period. This net fall of 2 percent in poverty certainly indicates progress in the right direction. But taken at face value, these cross sectional figures do not offer us any insights on whether the nature of poverty mobility is characterized by extreme volatility (i.e., where almost all the poor households in the first period escaped poverty and were all replaced by households that had previously been non-poor in the first period) or near stagnation (i.e., where almost all these households see no change in their welfare).

Policies to deal with these situations are clearly very different. While transitory poverty would be most effectively addressed with strong social protection programs that help prevent non-poor but vulnerable households from falling into poverty, chronic poverty may only be ameliorated with longer-term investment in human capital and infrastructure. Thus the appropriate policy advice would be well informed by analysis of dynamic aspects of welfare.

We make several original contributions in this paper, both on the conceptual and empirical fronts. Our first conceptual contribution is to provide a study of welfare dynamics for countries in the MENA region that combines both objective welfare measures (i.e., money-metric indicators of poverty) and subjective welfare measures (i.e., life satisfaction). Subjective welfare measures is a good alternative to and can complement monetary measures since the latter do not reflect many important quality-of-life factors such as job satisfaction, expectations about the future, public services (e.g., health, education, transportation), the environment or control of corruption. These

factors are difficult, if not impossible, to be measured well with objective data.[1] The combination of both types of measures for analysis of welfare dynamics would thus present a more comprehensive picture than using each alone. To our knowledge, few, if any, previous studies attempt to provide such analysis as we do.

On the empirical front, one major obstacle to studies of welfare dynamics for the region is the ubiquitous absence of panel survey data. Even where such panel surveys exist, they are often plagued with data quality issues such as attrition bias, where households tend to drop out of the sample in follow-up survey rounds. Furthermore, the definition of "panel data" may itself vary for different contexts (e.g., a panel can be defined based on whether the household head remains the same, or simply that households living in the same residence are tracked over time). Our second contribution is to overcome the lack of actual panel data for the region by constructing synthetic panels from repeated cross sectional survey rounds using the methods developed in Dang, Lanjouw, Luoto, and McKenzie (2014) and Dang and Lanjouw (2013). These synthetic panels allow us to examine the transitions into and out of poverty or life dissatisfaction (unhappiness) at both the national and regional level. Furthermore, since these synthetic panels are constructed from fresher rounds of the repeated cross sections, they are (much) less affected by the issues discussed above.

Finally, the MENA region presents an interesting case for analysis for different reasons. Firstly, there is much heterogeneity with poverty this region, which ranges from less than one percent (e.g., Palestine) to more than 50 percent (e.g., Yemen) using the international poverty line of $2/day. Thus while poverty reduction for countries with low poverty rates such as Palestine may

[1] For example, recent evidence points to significant differences between the perceived income distribution and the actual income distribution in Egypt between 2000 and 2008 (Verme, 2014). In 2000, Egyptians viewed themselves as more affluent than they were, but by 2008 they felt poorer despite becoming richer (as shown by household survey data). See also Ravallion (2012) for an overview of the use of objective data in measuring poverty.

appear negligible, it can be quite impactful for other countries with high poverty rates. Against this background, dynamic analysis is even more relevant. In particular, we do not just divide the population into the poor and the non-poor, but we further disaggregate the non-poor into two subgroups—the vulnerable and the middle class (or affluent)—and present analysis of the dynamics for these three welfare categories.

Secondly, the unfolding events related to the Arab Spring are unexpected and would undoubtedly have much impact on the regional economy and political system. The subjective welfare data we analyze include the period 2009-2012, which spans the conflicts occurring in several countries. This unique data vignette offers a rare advantage where we can track the trajectories of life satisfaction in Arab Spring countries, taking into account the effects of the conflicts, versus those for the other countries in the region in the same period.

Our findings suggest that analysis of welfare dynamics using household surveys' expenditure data do not always align with that based on subjective wellbeing data, which points to the need to combine both type of data for richer analysis. We also find that upward mobility for objective welfare was reasonably good in developing MENA countries. Upward mobility was particularly strong in Palestine, Tunisia, and Syria, and downward mobility is largest for Yemen, Egypt, and Jordan. However, life satisfaction was falling in most countries during the period 2009-2012. The share of dissatisfied people increased while those of the happier groups declined in almost all countries, particularly for the Arab Spring countries. Only Morocco shows positive dynamics with the size of the unhappy population declining by more than a quarter.

This paper consists of five sections. We provide a brief overview of the framework of analysis in the next section, which is then followed by discussion of the data and the regional context in Section III, and discussion of estimation results for the welfare dynamics in Section IV. Section V concludes with policy recommendation.

II. Framework of Analysis

II.1. Overview of Synthetic Panel Method[2]

Let x_{ij} be a vector of household characteristics observed in survey round *j* (j= 1 or 2) that are also observed in the other survey round for household i, i= 1,…, N. These household characteristics include variables that may be collected in only one survey round, but whose values can be inferred for the other round. These variables may be roughly categorized in three types i) time-invariant variables such as ethnicity, religion, place of birth, or parental education; ii) deterministic variables such as age (which given the value in one survey round can then be determined given the time interval between the two survey rounds),[3] and ii) time-varying household characteristics if retrospective questions about the values of such characteristics in the first survey round are asked in the second round.

Then let y_{ij} represent household consumption or income in survey round j, j= 1 or 2. The linear projection of household consumption (or income) on household characteristics for each survey round is given by

$$y_{ij} = \beta_j' x_{ij} + \varepsilon_{ij} \qquad (1)$$

Let z_j be the poverty line in period j. We are interested in knowing such quantities as

[2] We provide an overview of the methods that construct synthetic panels developed by Dang et al. (2014) and Dang and Lanjouw (2013) in this section. Interested readers are referred to these papers for more details. Recent applications/ validations of these methods against actual panel data include Bierbaum and Gassmann (2012) for the Kyrgyz Republic, Ferreira et al. (2013) and Cruces et al. (2015) for Latin American countries, Martinez et al. (2013) for the Philippines, Garbero (2014) for Vietnam, Cancho et al. (2015) for European and Central Asian countries, and Dang and Lanjouw (2015) for India.

[3] To reduce spurious changes due to changes in household composition over time, we usually restrict the estimation samples to household heads age, say 25 to 55 in the first cross section and adjust this age range accordingly in the second cross section. This restriction also helps ensure certain variables such as heads' education attainment remains relatively stable over time (assuming most heads are finished with their schooling). This age range is usually used in traditional pseudo-panel analysis but can vary depending on the cultural and economic factors in each specific setting. The Gallup Poll Survey collects individual data for people age 15 or older rather than household data, thus we restrict individuals to the age range 15-55 to keep reasonable sample sizes.

$$P(y_{i1} < z_1 \text{ and } y_{i2} > z_2) \qquad (2a)$$

which represents the percentage of households that are poor in the first (or previous) period but nonpoor in the second (or current) period, or

$$P(y_{i2} > z_2 \mid y_{i1} < z_1) \qquad (2b)$$

which represents the percentage of poor households in the first period that escape poverty in the second period. For the average household, quantity (2a) provides the joint (unconditional) probabilities of household poverty status in both periods, and quantity (2b) the conditional probabilities of household poverty status in the second period given their poverty status in the first period. Put differently, using panel data, quantities (2a) or (2b) provide the gross changes of poverty over time, which adds a dynamic and more nuanced picture to the net change of poverty that can simply obtained by comparing the headcount poverty rates in two cross sections.

If true panel data are available, we can straightforwardly estimate the quantities in (2a) and (2b); but in the absence of such data, we can use synthetic panels to study mobility. To operationalize the framework, we make two standard assumptions. First, we assume that the underlying population being sampled in survey rounds 1 and 2 are identical such that their time-invariant characteristics remain the same over time. More specifically, coupled with equation (1), this implies the conditional distribution of expenditure in a given period is identical whether it is conditional on the given household characteristics in period 1 or period 2 (i.e., $x_{i1} = x_{i2}$ implies $y_{i1}|x_{i1}$ and $y_{i1}|x_{i2}$ have identical distributions). Second, we assume that ε_{i1} and ε_{i2} have a bivariate normal distribution with positive correlation coefficient ρ and standard deviations σ_{ϵ_1} and σ_{ϵ_2} respectively. Quantity (2a) can be estimated by

$$P(y_{i1} < z_1 \text{ and } y_{i2} > z_2) = \Phi_2\left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\varepsilon_1}}, -\frac{z_2 - \beta_2' x_{i2}}{\sigma_{\varepsilon_2}}, -\rho\right) \qquad (3)$$

where $\Phi_2(.)$ stands for the bivariate normal cumulative distribution function (cdf)) (and $\phi_2(.)$ stands for the bivariate normal probability density function (pdf)). In equality (3), the parameters β_j and σ_{ε_j} are estimated from equation (1), and ρ can be estimated using an approximation of the birth-cohort-aggregated household consumption between the two surveys. Note that in equality (3), the estimated parameters obtained from data in both survey rounds are applied to data from the second survey round (x_2) (or the base year) for prediction, but we can use data from the first survey round as the base year as well. It is then straightforward to estimate quantity (2b) by dividing quantity (2a) by $\Phi\left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\varepsilon_1}}\right)$, where $\Phi(.)$ stands for the univariate normal cumulative distribution function (cdf).[4]

II.2. Welfare Thresholds and Dynamics

Beyond dichotomizing the population into two categories—the poor and the non-poor—we can in fact further divide the population into three categories for richer analysis. We follow two approaches in setting the welfare thresholds (lines) that define these groups. The first approach builds on World Bank's definition of shared prosperity (as growth in mean consumption for the bottom 40 percent of the income distribution; see, e.g., Basu, 2013; Jolliffe et al., 2015) and defines the two lower income groups respectively as the bottom 40 percent and the middle 40 percent. The remaining 20 percent of the income distribution thus forms the top 20 percent or the affluent.[5] But given our focus on dynamics analysis, our definition is different: after dividing the income

[4] Further asymptotic results and formulae for the standard errors are provided in Dang and Lanjouw (2013).

[5] In a slight abuse of notation, we use the pairs of terms "income" and "consumption", and "(un)happiness" and "(dis)satisfaction" interchangeably in this paper. A similar note applies for the terms "top 20 percent", "middle class", and "affluent". We also refer to the poor or the bottom 40 percent as the lowest income group, the vulnerable or the middle 40 percent as the middle income group, and the middle class or the top 20 percent as the top income group.

distribution into three groups in the first period, we keep these income thresholds fixed for the second period.[6]

The second approach follows Dang and Lanjouw (2014) and employs the existing (national or international) poverty line to define the poor category. It then further disaggregate the non-poor group into two subcategories: one group is the vulnerable, who are defined as currently non-poor but may face a significant risk of falling into poverty in the next period, and the other is the middle class (or affluent), who are defined as the remaining group with higher consumption levels. This approach derives the vulnerability line from a specified vulnerability index $\mathcal{P}$, which can in turn be anchored to various objectives or targets such as budgetary planning, (ideal or desirable) social welfare objectives, or relative concepts of well-being. More specifically, the vulnerability index is defined as the percentage of the non-poor population in the first period that fall into poverty in the second period.[7].

These two approaches are complementary on several aspects. First, the first approach applies a fixed and static threshold to the income distribution while the second approach takes into account the dynamics of income change over time in adjusting the vulnerability line. Second, depending on income levels and the poverty line, the bottom 40 percent of the income distribution can accommodate a variety of poverty scenarios, ranging from consisting of all the poor to very little of the poor (we will come back to this with an empirical illustration later). Thus by explicitly focusing on the population below the poverty line rather than in the bottom 40 percent, the second approach can better track the change of the poor group. Finally, since the income distribution varies

[6] Put differently, the World Bank's standard definition is most relevant for anonymous growth analysis, where the consumption level for the bottom 40 percent in each period is tracked. Our focus is on non-anonymous growth analysis, where we track welfare of the same households (individual) over time.

[7] More specifically, given a specified vulnerability index $\mathcal{P}$, the vulnerability line V_0 can be empirically obtained from this equality $\mathcal{P} = P(y_1 \leq Z_1 | Z_0 < y_0 < V_0)$. See Dang and Lanjouw (2014) for more details.

from country to country, the fixed thresholds under the first approach are country-specific, which can then be supplemented with region-wide vulnerability lines that can be derived under the second approach.[8]

Regardless of which approach is employed, given two income thresholds (z_j and v_j) for the two lower income groups, we can extend expression (2a) to analyze the transitions among the three welfare categories. For example, the percentage of poor households in the first period that escape poverty but still remain vulnerable in the second period (joint probability) is

$$P(y_{i1} < z_1 \; and \; z_2 < y_{i2} < v_2) = \Phi_2\left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\varepsilon_1}}, \frac{v_2 - \beta_2' x_{i2}}{\sigma_{\varepsilon_2}}, \rho\right) - \Phi_2\left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\varepsilon_1}}, \frac{z_2 - \beta_2' x_{i2}}{\sigma_{\varepsilon_2}}, \rho\right) \quad (4)$$

More generally, equality (4) also represents the percentage of the population in the lowest income group in the first period that move to the middle income group in the second period.

II.3. Defining Shared Prosperity

After classifying the population into three welfare categories: the lowest income group, the middle income group, and the top income group, we can track the growth in the population sizes of each group over time. We can employ a simple typology of pro-poor growth scenarios for the three welfare groups provided in Dang and Lanjouw (2016) to obtain a ranking for the different growth scenarios. There are in total six possible growth scenarios depending on whether (the population share for) each of the three categories is expanding or shrinking.[9] The first three scenarios relate to the reduction of the lowest income category, while the remaining three scenarios concern the expansion of this category. Thus by our pro-poor definition, these first three scenarios

[8] It is theoretically possible to consider the bottom 40 percent of the income distribution for the whole region instead of a single country, but this may not add much value to country-level analysis if there exists heterogenous income levels among countries. As shown later, this is highly relevant to the context of the MENA region.

[9] Since these three groups add up to 100 percent, two other scenarios of either expanding or shrinking for all these groups as shares of the population are out of the question. In other words, the increases and decreases in the population shares of the three groups should cancel out each other in the total.

indicate positive growth, and the remaining scenarios suggest negative growth. The growth of the middle income category helps determine further the rate of growth, for example, whether growth is more positive or simply positive.

This typology is shown in Table 1, which shows that the most positive pro-poor growth scenario is that both the lowest income and middle income categories are reduced while the top income category expands (Scenario 1). This is also the best general economic growth scenario, where everyone—regardless of which welfare categories they are in—is on average better off. On the other hand, the worst pro-poor scenario is where both the lowest income and middle income categories increase while the top income category is reduced and everyone on average loses (Scenario 6), which is the opposite of Scenario 1. All the remaining scenarios can be similarly classified based on the changes in the sizes of these three categories.

Some remarks are in order for this simple typology. First, consistent with a pro-poor criterion, growth is considered strongest—or shared prosperity is largest—when the two lower income groups are reduced. Second, the ranking provided in Table 1 provides a strong focus on the lower income groups, rather than the mean of the distribution. From this perspective, a growth scenario where the whole economy may grow on average but poor households become poorer is less desirable than another where the economy can slightly contract but poor households are better off.

Finally, the typology provided in Table 2 is general enough to be employed with different definitions of welfare categories, as well as different welfare outcomes including objective measures and subjective measures. As discussed in Dang and Lanjouw (2016), these lines can also be obtained using a variety of approaches, such as employing a range of fixed percentiles of the income distribution (say, between the 40^{th} and 80^{th} percentiles as in Alesina and Perotti, 1996) or some absolute cutoff thresholds such as between $2 and $10 PPP dollars (Banerjee and Duflo, 2008). As shown in the next section, this property is most relevant to our analysis since we employ

two different ways to derive the appropriate welfare thresholds that can be used with objective or subjective measures of well-being.

III. Data, Setting Welfare Thresholds, and Regional Context

III.1. Data

In this paper we analyze household surveys for six Arab economies, including Egypt, Jordan, Palestine territories, Syria, Tunisia, and Yemen. These surveys have been harmonized for comparability both across countries and within countries over time with technical advice from the World Bank, LIS, OECD, and country statistical offices. This harmonization process is described in greater detail in Hassine (2015). All expenditure data used in this analysis are deflated by the CPI of the respective economy and year and adjustments for spatial price differences were made for Egypt, Syria, and the Palestine territories.[10] PPP conversion factor for private consumption (LCU per international dollar) from the World Development Indicators database (World Bank, 2015) is used to compare consumption expenditure levels between countries. Only in the case of Palestine, the PPP conversion factor for GDP is used instead.

The household surveys available to us cover different years for different countries. While these surveys mostly cover the late 2000s (for Egypt, Jordan, Palestine, and Tunisia), they were also implemented earlier during the late 1990s and the early 2000s (for Syria and Yemen). Appendix Table 1.1 shows for each country the names of the surveys, the survey years, and the headcount poverty rates for the first and last years in the survey period.

In order to assess the welfare dynamics with alternative, subjective welfare measures, we employ data on subjective wellbeing from the Gallup World Poll. The annual Gallup World Poll

[10] The absence of spatial price differentials prevented the adjustments for regional price differentials in Jordan, Tunisia, and Yemen.

contains nationally representative country samples of at least 1,000 randomly selected respondents who are 15 and older. Since most of the variables (including education achievement) that are employed in the construction of the synthetic panels are only collected in the Gallup Poll in 2009 or after, we focus on the whole period 2009-2012 in order to obtain a longer term perspective and include all Arab countries for which we have subjective wellbeing information. But we also offer some brief graphical analysis of life satisfaction for several countries for the period immediately preceding the Arab Spring (2007-2010) and the period after the Arab Spring (2010-2012).

Life satisfaction in the Gallup Poll was measured using a single questions, known as the "Cantril Ladder" or "Self-Anchoring Striving Scale" (Cantril, 1965). The question is stated as follows:

> *"Please imaging a ladder, with steps numbered from 0 at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?"*

The higher the given score is, the closer the respondent's life is to his or her 'ideal' life.

III.2. Setting Welfare Thresholds

Table 2 provides the country-specific thresholds for the bottom 40 percent and the middle 40 percent for both objective measures and subjective measures, based on our first definition of the welfare categories. As discussed above, these thresholds are obtained from the data in the first survey period and are then kept fixed in the second period for the welfare dynamics analysis. This table provides an interesting illustration of our earlier discussion that the bottom 40 percent can be composed of a wide variety of poverty situations. For example, the bottom 40 percent in Egypt includes all the extremely poor and some of the poor as the cutoff line for the 40th percentile is $2.5/day (column 3), which is above the national extreme poverty line. But this threshold is very

close to the national extreme poverty line in Syria, thus the bottom 40 percent includes primarily the extremely poor for this country.

The thresholds based on our second definition of the welfare categories are simpler and set for the whole region. They are $2/day and $4.9/day respectively for the poverty line and the vulnerability line. The latter corresponds to a vulnerability index of 20 percent, which is comparable to vulnerability analysis done for other countries including India, the United States, and Vietnam (Dang and Lanjouw, 2014 and 2015; Rama et al., 2015).[11]

Employing the second definition of the welfare categories would require empirical iterations that work best with continuous variables such as household consumption. Since the subjective welfare measure is a discrete variable (with 10 values only), we thus use the first definition of the welfare categories and search for the cutoff points below which the shares of the population are closest to 40 percent or 80 percent. For example, the threshold for the lowest welfare category is are 5 for Algeria (column 5), where 49 percent of the population report a satisfaction score at or below this score (column 6). But the corresponding threshold for Lebanon is 4, with 29 percent of the population falling below this score.[12]

III.3. Regional Context

Extreme poverty is not an issue in the MENA region. As the regional poverty rate dropped below 2 percent between 2005 and 2011, the number of extremely poor people living on less than $1.25/day (in 2005 PPP$) in the region declined by about one million. Consequently, the absolute poverty line of $1.25 cannot capture much poverty where most countries are middle-income economies and average per capita incomes are relatively high. Furthermore, raising this poverty

[11] A range of vulnerability lines that correspond to other vulnerability indexes are provided in Table 1.3 in Appendix 1.

[12] Raising the score to 5 would increase the population below this score to 56 percent, which is farther from the 40 percent mark.

line to $2 a day changes dramatically the poverty picture for many developing MENA countries, especially, Egypt, Yemen, Iraq, and Morocco (Figure 1). This suggests that in many Arab countries a large share of the vulnerable population is clustered near the $1.25 poverty line, which turns out to be too low in many cases. Abu-Ismail and Sarangi (2013) show that the equivalent of $1.25 in current Egyptian currency is below the value of the national food poverty line, which is estimated to be $2.3/day in 2011. This value is close to the national poverty line of Syria, which is estimated at $2.2/day in 2003-04 (Laithy and Abu-Ismail, 2005).

Given the objective of presenting cross-country comparisons, we fix the poverty line at $2 a day (in 2005 PPP$) for all the countries in our sample. This line is close to the extreme national poverty thresholds for Syria and Egypt, although it is above the national poverty lines in Yemen and below the national poverty lines in Tunisia, Jordan, and the Palestine territories. Therefore, it overestimates poverty in Yemen but underestimates poverty in Tunisia, Jordan, and Palestine (Figure 1). Figure 1 also indicates some progress with poverty reduction during the 2000s. Poverty rates increased only in Egypt and Yemen, declined in Tunisia and Syria, and changed little in Jordan and Palestine.

The subjective wellbeing data, however, reveals a different picture from the household survey data. It shows a uniformly bleak situation in the period before the Arab Spring (Figure 2, top panel). In all developing MENA countries, the percentage of dissatisfied (unhappy) people – those with life evaluation scores of 4 and below – was high and average life satisfaction scores declined between 2007 and 2010. The deterioration was particularly large in the Arab Spring countries, especially Egypt and Syria. By the end of the decade almost half of the surveyed people in Syria and Egypt were unhappy about their life (Figure 2, top panel). Importantly, unhappiness rates in Arab Spring countries were much higher than the average for the region (Figure 2, top panel).

Furthermore, average subjective wellbeing levels in nearly all developing Arab countries kept deteriorating after 2010. Unsurprisingly, the post-Arab Spring decline has been most pronounced in Syria where the civil war took many lives, displaced millions of families, and resulted in massive destruction. The share of unhappy people in Syria nearly doubled, reaching 75 percent of the population, compared to just 45 percent in 2010 (Figure 2, bottom panel). In all other Arab developing countries, the deterioration has been moderate to mild. Only in Morocco, average subjective wellbeing levels improved and the share of unhappy people declined markedly (Figure 2, bottom panel).

Overall, the period between 2009 and 2012 was a tumultuous one as dissatisfaction rates skyrocketed in many Arab countries. The rate of suffering was highest in Syria, followed by Yemen, Egypt, and Iraq (Figure 3). Morocco was the only country where the situation improved substantially. Whereas in 2010 Morocco had the highest rate of unhappiness in the region, by 2012 Morocco had the third lowest rate of unhappiness.

IV. Estimation of Welfare Dynamics

IV.1. Welfare Dynamics for Monetary Measures

Table 3 provides estimates on poverty mobility. For ease of presentation, we show the decomposition of the headcount poverty rate in the second period (column 4) into two components, the chronic poor (i.e., those who remain poor in both periods; column 5) and the downward mobile (i.e., those were nonpoor in the first period but poor in the current period; column 6).[13] Similarly, poverty rate in the first period (column 3) can also be decomposed into two components, the

[13] The equivalent mathematical expression can be written as $P(y_{i2} \leq Z_2) = P(y_{i1} \leq Z_1 \; and \; y_{i2} \leq Z_2) + P(y_{i1} > Z_1 \; and \; y_{i2} \leq Z_2)$, where the first term and the second term on the right hand side represent chronic poverty and downward mobility respectively. It follows that given a fixed poverty rate (in the second period), there is an inverse relationship between chronic poverty and downward mobility. Chronic poverty rates are estimated with the standard errors shown in Table 1.1 in Appendix 1. The underlying regressions for the household consumption models (equation 1) are also provided in this table.

chronic poor (column 5) and the upward mobile (i.e., those were poor in the first period but nonpoor in the current period; column 7). For comparison, the net change in poverty (column 8) is obtained by simply subtracting the poverty rate in the first period from that in the second period.[14]

The six countries as a whole is performing reasonably well in terms of mobility, with slightly more than half (53%) of the poor in the first period moving out of poverty in the second period (i.e., divide column 7 by column 3); but chronic poverty is also around 50 percent (i.e., divide column 5 by column 4). However, Yemen, Egypt, and Syria are the three poorest countries, of which the first two are the only countries that are actually becoming poorer over time (column 8). The share of chronic poverty in the current period is largest in Syria (87%), which is followed by Yemen (51%), and then Egypt (46%). Notably, Yemen also has the lowest share of upward mobility (12%), which is just slightly more than one third of the second least upward mobile country Egypt (34%). On the other hand, upward mobility (compared to the first period) is fairly high at around 80 percent or more for the remaining countries, where Palestine takes the lead at 93 percent, to be followed by Tunisia (87%), Syria (82%), and Jordan (77%).

This result supports our earlier discussion that monetary measures may not always align with subjective measures of welfare. In particular, Egypt shows both increasing poverty (Table 3) and rising unhappiness before the Arab Spring (Figure 2), which is similar for Yemen to a lesser degree. However, this stands in sharp contrast with Syria and Tunisia which witness falling poverty but rising unhappiness in the same period. We will come back to more discussion on the dynamics of life satisfaction in the next section.

We further divide the population into three groups: the lowest income group (the bottom 40 percent or the poor), the middle income group, and the top income group for richer analysis. These

[14] Table 3 (column 1) provides an interesting illustration of our earlier discussion that the bottom 40 percent can be composed of a wide variety of poverty situations, ranging from all the households being poor (Syria) to around half being poor (Egypt) to very few of them being poor (Palestine).

three groups correspond to the bottom 40 percent, the middle 40 percent, and the top 20 percent under the first definition of the welfare categories, and the poor, the vulnerable, and the middle class under the second definition of the welfare categories. Estimation results shown in Table 4 and Table 5—which respectively employ the first and second definitions—are broadly consistent with the poverty mobility trends discussed in Table 3. In particular, Yemen and Egypt fall under a more negative pro-poor growth scenario under both definitions, where the lowest income group expand and the middle and top income groups contract. These countries also suffer from a sizable reduction in average consumption over time, even though the shrinkage of -26 percent in Yemen is as large as twice that in Egypt (Tables 4 or 5, column 7).

Yet, a more nuanced picture of growth emerges for the different welfare groups in the remaining countries depending on how the different welfare groups are defined. Under the first definition of the welfare groups, Syria has the most positive growth scenario, which is followed by Tunisia and Palestine (more positive growth) and Jordan (positive growth) (Table 4, column 6). But this order changes according to the second definition: except for Tunisia and Jordan that retain their same rank, Syria and Palestine switch places with the latter now taking the lead in terms of pro-poor growth (Table 5, column 6). This is consistent with the fact that the second definition of the welfare groups focuses on and strongly rewards growth for the lowest income group. Unsurprisingly, all the four countries also have better growth under this definition: Palestine and Tunisia enjoy the most positive growth scenario, to be followed by Syria and Jordan both in a more positive growth scenario (Table 5, column 6).

Two useful observations can further be made for these different growth scenarios. First, Syria stands out with it dramatic increase in the top income group (more than 200% and 300% respectively in Table 4 and Table 5) and a corresponding large decline of the lowest income group (approximately 80% reduction). Syria also enjoys a dramatic growth of mean consumption (94%)

in this period. Second, even though Jordan has a slightly negative growth in mean consumption (-1.5%), its growth scenario still positive (or more positive) thanks to its reduction of the lowest income group.

The results in Tables 4 and 5 focus on the increase or decrease of the population size of each welfare groups, but do not consider the movements among these groups.[15] Figure 4 probes more deeply into such transitions, and shows the percentage of the population that are upward mobile (i.e., moving from the lowest income group to the middle and top income groups, or from the middle income group to the top income group), immobile (i.e., remaining in the same income categories), and downward mobile (i.e., moving down one or two income categories).[16] Again, downward mobility (maroon bars) and upward mobility (orange bars) are unsurprisingly generally lower and higher respectively for the 2nd definition of welfare groups (Figure 4, right panel) since this definition favors the lower income groups. Estimation results provides a richer, but rather consistent analysis with our earlier discussion. The three countries with the least downward mobility are Syria, Tunisia, and Palestine—even though this order changes slightly with Tunisia and Palestine switching place depending on whether we use the 1st or 2nd definition of welfare groups—and these are also the three countries with strongest upward mobility. In fact, under the 2nd definition, Jordan also shows fairly good upward mobility. On the other hand, the most downward mobile countries are Yemen, Egypt, and Jordan.

IV.2. Welfare Dynamics for Subjective Well-being Measures

[15] For comparison, we also show in Table 1.4, Appendix 1 growth in the mean consumption for the different welfare groups under the first definition.

[16] Even though the terminology is similar to that used in Table 3, note that we divide the income distribution into three groups and provides more disaggregated analysis with Figure 4.

We now turn to analyzing subjective measures of well-being in this section using the Gallup Poll survey data. We provide in Table 6 the transition dynamics for the three income categories for the Arab Spring countries and the other countries in the region over the period 2009-2012.

There is an expansion of the unhappy and shrinkage of the less happy and happy (categories) for both groups of countries in this period. However, this deteriorating trend is stronger for the Arab Spring countries, particularly for higher satisfaction categories. Specifically, the increase of the unhappy category for the other countries in the region is 26 percent (i.e., = 1- (42.1/33.5)), which is slightly less than that of 31 percent for the Arab Spring countries. But the decrease of the less happy and the happy for the former are 16 percent and 11 percent, less than one half and one fourth respectively of the corresponding figures (of 38 percent and 47 percent) for Arab Spring countries. In terms of absolute numbers, the unhappy category for Arab Spring countries expands by 15 percentage points and increases from around half of the population in 2009 to more than half of the population in 2012, which is half a time larger than the unhappy category for the other countries. The happy category for Arab Spring countries also moves from being larger than that for the other countries in 2009 to being slightly smaller in 2012.

Another useful way to gauge the satisfaction dynamics is to look at the percentage of the population that change their welfare status over time. For Arab Spring countries, 18 percent of the population move up one or two welfare categories (i.e., the sum of the upper off-diagonal cells) the percentage that move down one or two welfare categories (i.e., the sum of the lower off-diagonal cells) is twice as large at 34 percent. The corresponding figures for the other countries in the region are smaller and respectively 15 percent and 25 percent.

For further comparison, we also provide analysis for the region as a whole and show estimation results in Table 1.5, Appendix 1. The regional trend is qualitatively similar, with 15 percent of the

population moving up one or two welfare categories and 28 percent moving down one or two welfare categories in this period.

As discussed, we have to drop seven countries with a small sample size, and we provide the country-level satisfaction dynamics in Figure 5 for the remaining nine countries. Similar to Figure 4 that considers the dynamic for monetary measures, this figure defines the (upward) downward mobile as those that move (up) down one or two income categories, and the immobile are those that remain in the same income categories. Unsurprisingly, the Arab Spring countries—Syria, Yemen, Egypt, and Tunisia—are again shown to have the most downward mobility in this order. These countries also have the least upward mobility.

The growth patterns for the different satisfaction categories shown in Table 7 provides a similar story. The four Arab Spring countries rank lowest in terms of pro-unhappy growth, and the nine countries as whole fall under a more negative growth scenario. The only country that records a (more) positive growth scenario in this period is Morocco, which manages to reduce the size of their unhappy population by more than a quarter. All the rest of the region suffer an expansion of the unhappiness categories in varying degrees.[17]

V. Conclusions

We provide systematic analysis of welfare dynamics in the Arab countries using both objective measures and subjective measures of well-being. The advantage of the latter is that they capture factors important to subjective wellbeing such as quality of life, expectations, and changes not yet reflected or not measured well with objective data. The use of alternative welfare measures is essential as the period we focus on forms a watershed moment in the history of the Arab region,

[17] Notably, Yemen ranks last in Table 7 despite a much smaller increase of the unhappy category than, say Syria. This is due to the fact that, when the lowest welfare group expands for all countries, our definition of pro-unhappy (poor) growth scenario gives more weight to reducing the middle welfare group.

which is associated with profound change in the way people perceive events affecting their everyday life.

We draw several lessons from this work. First, analysis of welfare dynamics using household surveys' expenditure data do not always align with that based on subjective wellbeing data. In particular, Yemen and Egypt show rising poverty and unhappiness during the pre-Arab Spring period. But the results are qualitatively different for Syria and Tunisia for the same period which witness increasing unhappiness despite their decreasing poverty and stronger upward mobility in the MENA region.

Second, welfare dynamics based on expenditure measures suggests that upward mobility was reasonably good in developing MENA countries. Slightly more than half of the poor in the first half of the 2000s were able to move out of poverty by the end of the decade. However, chronic poverty was also high, accounting for around 50 percent of total poverty in the region. Upward mobility was particularly strong in Palestine, Tunisia, and Syria, and downward mobility is largest for Yemen, Egypt, and Jordan. Although the poverty rate in Syria declined dramatically, chronic poverty was still alarming high at the end of the 2000s, reaching almost 90%.

Third, the subjective welfare dynamics suggest negative developments in most countries during the Arab Spring transitions. The share of dissatisfied people increased while those of the happier groups declined in almost all countries. This trends is particularly pronounced in the Arab Spring countries. Only Morocco shows positive dynamics with the size of the unhappy population declining by more than a quarter.

Our analysis was constrained by the paucity of data, which prevented us from undertaking detailed subjective welfare dynamics by country before the Arab Spring and limited our ability to compare systematically the welfare dynamics with subjective and objective indicators. Cross-

country comparisons based on objective welfare dynamics metrics should also be interpreted with caution because the available household survey data were collected during different time periods.

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Table 1: Typology of Welfare Transition Dynamics over Two Periods

Scenario	Pro-poor Growth	Welfare Category			Notes
		1st group	2nd group	3rd group	
		Lowest income	Middle income	Top income	
1	Strongest/ Most positive	-	-	+	first and second group reduce, and third group expands
2	More positive	-	+	+	first group reduces, and second and third group expand
3	Positive	-	+	-	first and third group reduce, and second group expands
4	Negative	+	-	+	first and third group expand, and second group reduces
5	More negative	+	-	-	first group expands, and second and third group reduce
6	Weakest/ Most negative	+	+	-	first and second group expand, and third group reduces

Note: The signs (-) and (+) respectively stand for decrease and increase. Pro-poor growth is defined as the dynamics that are most beneficial to the different categories in this order: Lowest Income, Middle Income, and Top Income. This typology is modified based on Dang and Lanjouw (2016).

Table 2: Thresholds for 1st Definition for Welfare Categories

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No	**Country**	**Monetary measures ($/day)**		**Life satisfaction**			
		40th percentile	**80th percentile**	**40th percentile**		**80th percentile**	
				Sat. score	**Population (%)**	**Sat. score**	**Population (%)**
1	Algeria	N/A	N/A	5	48.8	7	86.9
2	Egypt	2.5	4.3	4	29.2	6	80.9
3	Iraq	N/A	N/A	4	41.8	6	85.1
4	Jordan	4.3	7.6	5	35.9	7	81.7
5	Lebanon	N/A	N/A	4	28.8	6	71.3
6	Morocco	N/A	N/A	4	45.0	6	88.2
7	Palestine	6.5	13.6	N/A	N/A	N/A	N/A
8	Syria	2.0	3.6	4	37.9	6	77.1
9	Tunisia	4.2	9.1	4	23.9	6	80.7
10	Yemen	2.3	4.5	4	42.0	6	79.1
	Average	3.6	7.1	4.2	37.0	6.2	81.2

Note: Authors' calculations are based on household survey data for columns 3 and 4, and Gallup Poll survey data for columns 5 to 8. All estimates are obtained using population weights. Household heads' age is between 25 and 55 in the first survey round and adjusted accordingly for the second survey round for columns 3 and 4; respondents' age is between 15 and 55 in the first survey round and adjusted accordingly for the second survey round for columns 5 to 8. The thresholds that identify the different welfare categories are obtained from data in the first period, and are kept unchanged for the second period. "N/A" indicates that data are unavailable.

Table 3: Net and Gross Changes in Poverty over Time for Each Country (percentage)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
No	**Country**	**Headcount poverty in 1st period**	**Headcount poverty in 2nd period**			**Upward mobile**	**Net change**
			Total	**Decomposition**			
				Chronic poverty	**Downward mobile**		
1	Palestine	1.4	0.7	0.1	0.6	1.3	-0.7
2	Jordan	4.3	2.4	1.0	1.4	3.3	-1.9
3	Tunisia	9.4	4.9	1.2	3.7	8.2	-4.5
4	Syria	40.5	8.4	7.3	1.1	33.2	-32.1
5	Egypt	20.2	29.2	13.3	15.9	6.9	9.0
6	Yemen	32.3	55.8	28.3	27.5	4.0	23.4
	Average	18.0	16.9	8.5	8.3	9.5	-1.1

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights. Household heads' age is between 25 and 55 in the first survey round and adjusted accordingly for the second survey round. The poverty line is set at $2/ day in 2005 PPP dollars for both periods. Estimates for chronic poverty are based on the synthetic panels. Countries are ranked in an increasing order of poverty in the 2nd period. Columns 5 and 6 add up to column 4, and columns 5 and 7 add up to column 3. Column 8 is obtained by subtracting column 4 from column 3.

Table 4: Change in Shared Prosperity for Each Country Using 1st Definition for Welfare Categories (percentage)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
No	**Country**	**Growth in the population share of each welfare category**			**Pro-poor growth scenario**	**Growth in mean consumption**
		Bottom 40%	**Middle 40%**	**Top 20%**		
1	Syria	-79.8	-21.2	202.0	most positive	96.4
2	Tunisia	-32.2	14.4	35.6	more positive	15.2
3	Palestine	-11.0	9.0	4.0	more positive	4.7
4	Jordan	-0.7	2.2	-3.0	positive	-1.5
5	Egypt	28.0	-13.7	-28.5	more negative	-12.6
6	Yemen	58.5	-31.9	-53.2	more negative	-25.9
	Average	-6.2	-6.9	26.2	most positive	12.7

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights. Household heads' age is between 25 and 55 in the first survey round and adjusted accordingly for the second survey round. The thresholds that identify the Poor and Vulnerable groups are respectively the 40th and 80th percentile of the income distribution in the first period. These thresholds are kept unchanged for the second period. Pro-poor growth scenarios are based on the classification provided in Table 1. Countries are ranked first in a decreasing order of pro-poor growth scenario, and then in an increasing order of growth in the population share of the bottom 40 percent and middle 40 percent.

Table 5: Change in Shared Prosperity for Each Country Using 2nd Definition for Welfare Categories (percentage)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
No	**Country**	**Growth in the population share of each welfare category**			**Pro-poor growth scenario**	**Growth in mean consumption**
		Poor	**Vulnerable**	**Middle Class**		
1	Palestine	-48.4	-17.0	6.1	most positive	4.7
2	Tunisia	-48.0	-21.7	26.0	most positive	15.2
3	Syria	-79.4	3.1	343.2	more positive	96.4
4	Jordan	-44.7	1.6	2.4	more positive	-1.5
5	Egypt	44.6	-7.0	-31.1	more negative	-12.6
6	Yemen	72.6	-28.7	-52.5	more negative	-25.9
	Average	-20.7	-13.9	58.8	most positive	15.2

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights. Household heads' age is between 25 and 55 in the first survey round and adjusted accordingly for the second survey round. The poverty line and vulnerability line are set at $2/day and $4.9/day respectively. The vulnerability line correponds to a vulnerability index of 20 percent. Pro-poor growth scenarios are based on the classification provided in Table 1. Countries are ranked first in a decreasing order of pro-poor growth scenario, and then in an increasing order of growth in the population share of the Poor and the Vulnerable.

Table 6: Satisfaction Transition Dynamics Based on Synthetic Panel Data, Arab Spring Countries and Other Regional Countries 2009- 2012 (percentage)

Panel A: Arab Spring countries		**2012**			
		Unhappy	**Less Happy**	**Happy**	**Total**
2009	**Unhappy**	35.4	9.9	3.1	48.4
		(0.1)	(0.0)	(0.0)	(0.1)
	Less Happy	20.6	9.9	4.5	35.0
		(0.0)	(0.0)	(0.0)	(0.0)
	Happy	7.5	5.5	3.6	16.5
		(0.0)	(0.0)	(0.0)	(0.0)
	Total	63.5	25.4	11.2	100
		(0.1)	(0.0)	(0.0)	
Panel B: Other regional countries		**2012**			
		Unhappy	**Less Happy**	**Happy**	**Total**
2009	**Unhappy**	24.6	8.6	0.4	33.5
		(0.1)	(0.0)	(0.0)	(0.1)
	Less Happy	16.7	29.5	6.0	52.2
		(0.0)	(0.0)	(0.0)	(0.0)
	Happy	0.8	7.0	6.5	14.3
		(0.0)	(0.0)	(0.0)	(0.0)
	Total	42.1	45.0	12.9	100
		(0.1)	(0.0)	(0.0)	

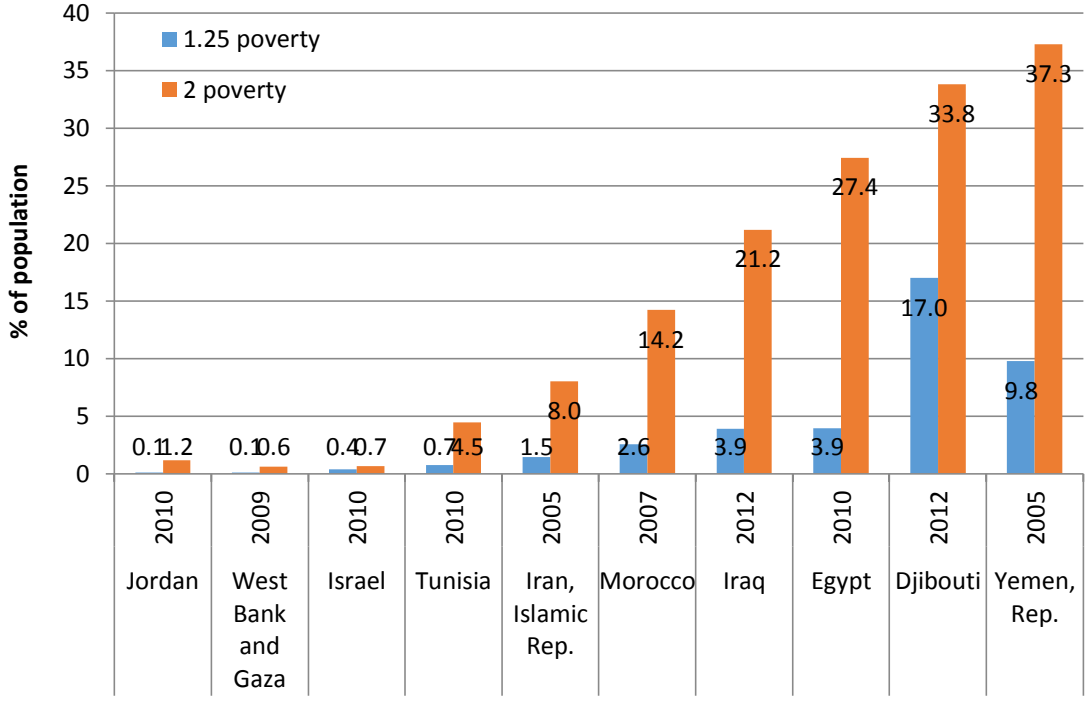
Note: Authors' calculation are based on Gallup Poll survey data. All numbers are estimated with synthetic panel data and weighted with population weights, where the second survey round is used as the base year. Bootstrap standard errors in parentheses are estimated with 1,000 bootstraps. Respondents' age is between 15 and 55 in the first survey round and adjusted accordingly for the second survey round. The satisfaction thresholds that identify the Happy and Less Happy groups are provided in Table 2. Estimation sample sizes in panel A are 9,192 individual for Arab Spring countries (Egypt, Libya, Syria, Tunisia, and Yemen) and in panel B are 17,652 individuals from the other regional countries (Algeria, Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Qatar, Saudi Arabia, and United Arab Emirates).

Table 7: Change in Satisfaction for Each Country, 2009-2012 (percentage)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
No	**Country**	**Growth in the population share of each welfare category**			**Pro-unhappy growth scenario**	**Growth in mean satisfaction**
		Unhappy	**Less happy**	**Happy**		
1	Morocco	-26.7	16.4	0.0	more positive	3.9
2	Algeria	1.7	-14.1	0.0	negative	-0.2
3	Iraq	6.0	-12.6	0.0	negative	-1.0
4	Lebanon	39.5	-4.4	-0.1	more negative	-12.6
5	Jordan	62.0	-30.1	-0.1	more negative	-15.6
6	Egypt	71.1	-23.2	-0.1	more negative	-18.1
7	Tunisia	74.3	-20.4	-0.1	more negative	-14.8
8	Syria	100.3	-68.7	-0.1	more negative	-37.2
9	Yemen	22.3	0.2	-0.1	most negative	-16.9
	Average	38.9	-17.4	0.0	more negative	-12.5

Note: Authors' calculation are based on Gallup Poll survey data. All estimates are obtained using population weights. Respondents' age is between 15 and 55 in the first survey round and adjusted accordingly for the second survey round. The satisfaction thresholds that identify the Happy and Less Happy groups are provided in Table 2. Pro-unhappy growth scenarios are based on the classification provided in Table 1. Countries are ranked first in a decreasing order of pro-unhappy growth scenario, and then in an increasing order of growth in the population share of the Unhappy (or bottom 40 percent) and the Less happy (or middle 40 percent).

Figure 1: Poverty Rates by Country

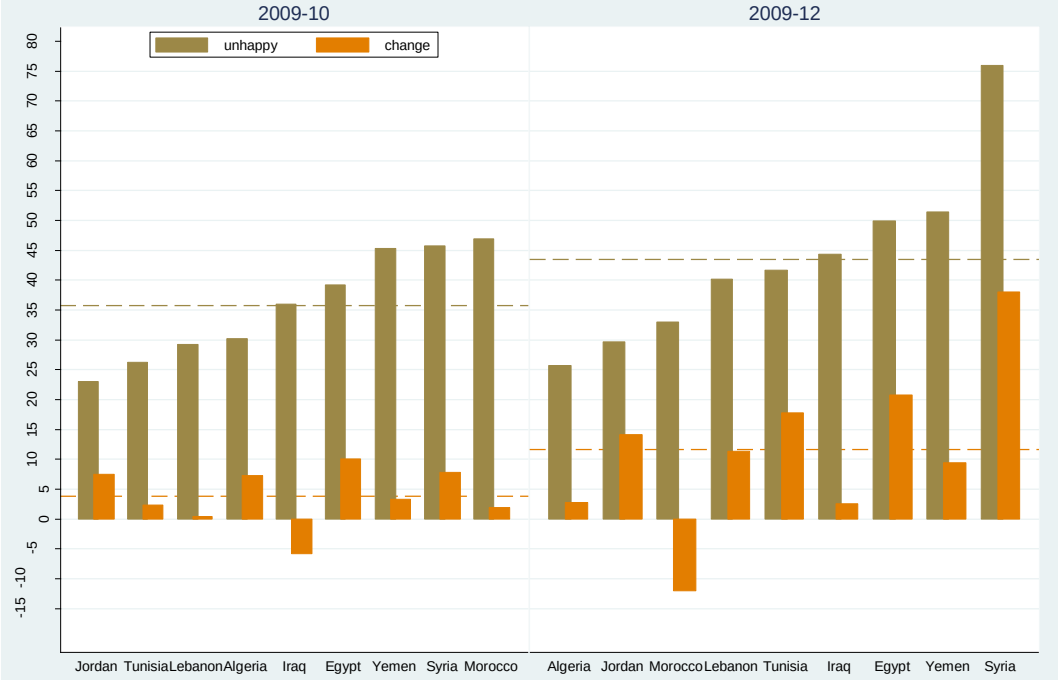


Source: Vishwanath, Atamanov and Krishnan (2015).

Figure 2: Dissatisfaction Rate for Arab Spring Countries vs. Other Countries, 2007-2012

note: dashed lines in dark brown and orange represent mean unhappiness rate and mean change respectively.

Figure 3: Dissatisfaction Rate for Each Country, 2009-2012



note: dashed lines in dark brown and orange represent mean unhappiness rate and mean change respectively; countries are ranked by poverty in the later period.

Figure 4: Welfare Dynamics Using Monetary Measures for Each Country

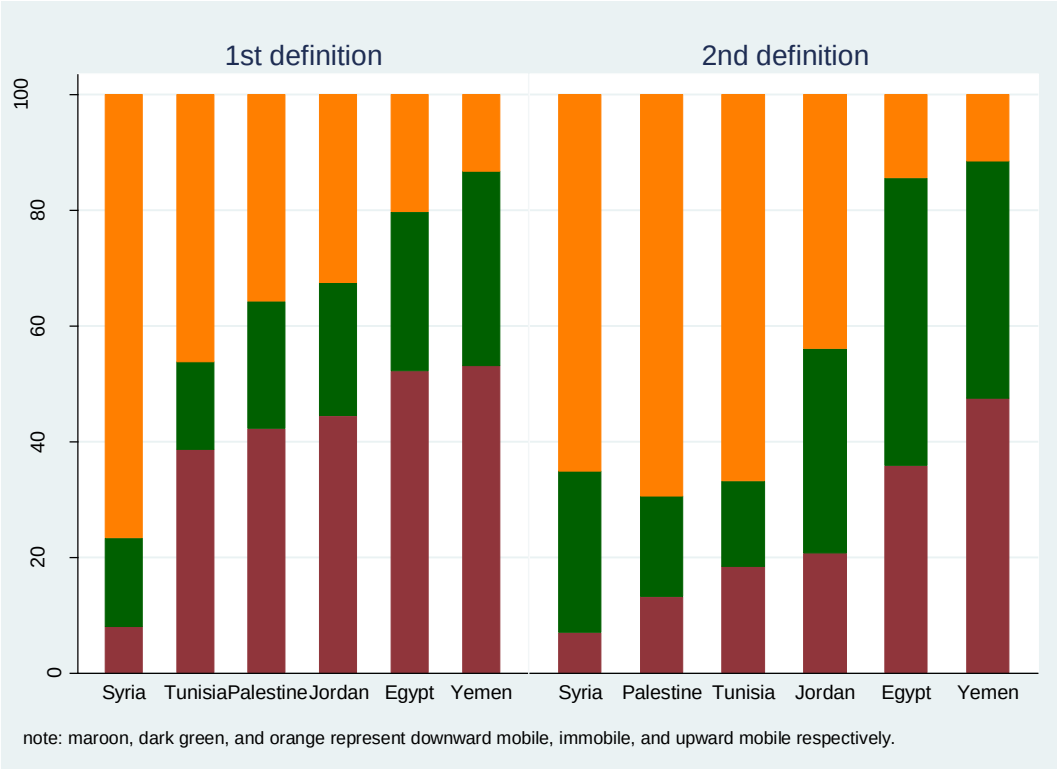
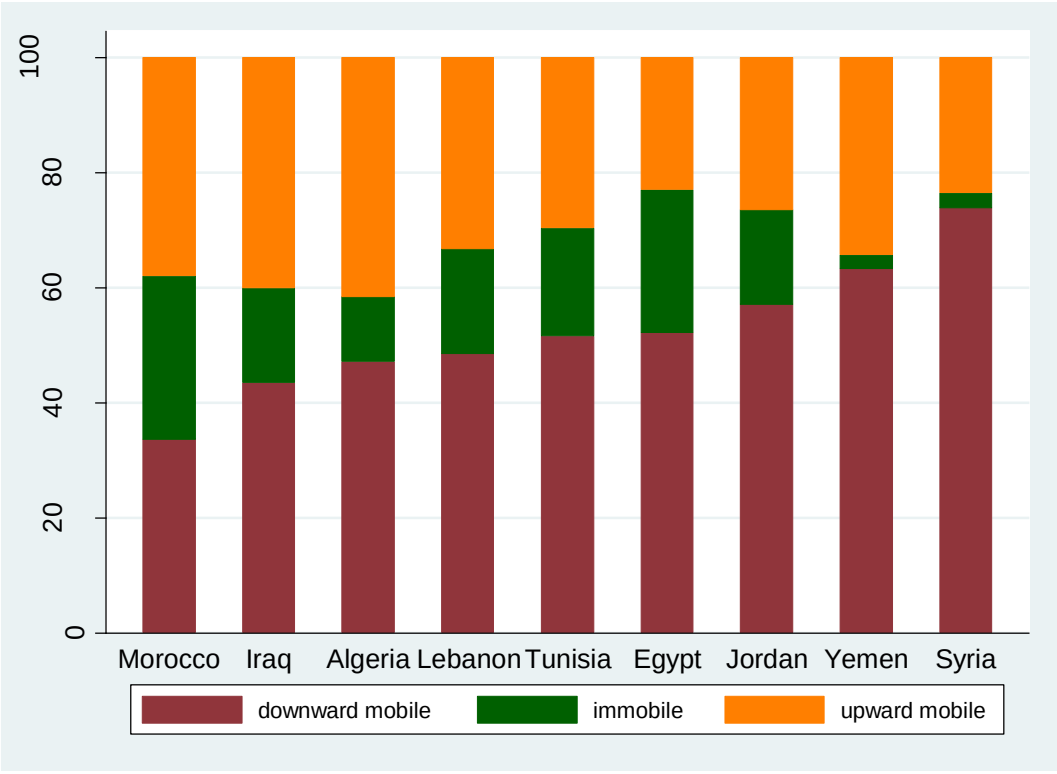


Figure 5: Satisfaction Dynamics for Each Country, 2009-2012 (percentage)



Appendix 1: Additional Tables

Table 1.1: Survey Years, Headcount Poverty and Dissatisfaction for Each Country (revise)

(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Objective being					
No	**Country**	**Survey name**	**Survey years**	**Headcount poverty (percent)**	
				1st period	**2nd period**
1	Egypt	Household Income, Expenditure and Consumption survey (HIEC)	2004-2009	19.0	28.6
2	Jordan	Household Expenditure and Income survey (HEIS)	2006-2008	3.8	2.2
3	Palestine	Palestine Expenditure and Consumption survey (PECS)	2005-2009	1.5	0.7
4	Syria	Household Budget survey (HBS)	1997-2004	38.8	7.5
5	Tunisia	Household Budget Consumption and Living Standards survey (HBCLS)	2005-2010	8.0	4.6
6	Yemen	Household Budget survey (HBS)	1998-2006	31.7	54.5
	Regional average			**17.1**	**16.4**
Panel B: Subjective being					
No	**Country**	**Survey name**	**Survey years**	**Dissatisfaction (percent)**	
				1st period	**2nd period**
1	Algeria	Gallup World Poll	2009-2012	23.2	25.8
2	Egypt	Gallup World Poll	2009-2012	30.2	49.4
3	Iraq	Gallup World Poll	2009-2012	41.7	45.7
4	Jordan	Gallup World Poll	2009-2012	16.1	28.1
5	Lebanon	Gallup World Poll	2009-2012	29.3	40.6
6	Morocco	Gallup World Poll	2009-2012	45.7	32.0
7	Syria	Gallup World Poll	2009-2012	37.9	75.0
8	Tunisia	Gallup World Poll	2009-2012	25.6	41.6
9	Yemen	Gallup World Poll	2009-2012	42.8	51.0
	Regional average			**32.5**	**43.2**
Note: Authors' calculation based on household survey data. The poverty line is set at $2/ day in 2005 PPP dollars, and the dissatisfaction threshold is set at a value of 4 (out of a scale of 10) for both periods. Objective data are updated based on Hassine (2015).					

Table 1.2: Household Consumption Models

	Country											
	Egypt		Jordan		Palestine		Syria		Tunisia		Yemen	
	2004	2009	2006	2008	2005	2009	1997	2004	2005	2010	1998	2006
Head is female	0.171***	0.162***	0.271***	0.264***	0.118	0.229***	0.143***	0.255***	0.274***	0.177***	-0.093***	0.122***
	(0.012)	(0.011)	(0.052)	(0.047)	(0.091)	(0.053)	(0.016)	(0.017)	(0.025)	(0.024)	(0.028)	(0.030)
Head's age	0.004***	0.008***	0.007***	0.006***	0.001	0.011***	-0.002***	0.007***	0.006***	0.010***	-0.005***	0.007***
	(0.000)	(0.000)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Head completes primary school	0.137***	0.161***	0.157***	0.158***	0.138***	0.183***	0.094***	0.134***	0.239***	0.217***	0.009	0.221***
	(0.012)	(0.011)	(0.047)	(0.044)	(0.053)	(0.040)	(0.009)	(0.011)	(0.022)	(0.020)	(0.033)	(0.024)
Head completes secondary school	0.218***	0.324***	0.286***	0.316***	0.276***	0.298***	0.159***	0.317***	0.586***	0.550***	0.156***	0.272***
	(0.009)	(0.029)	(0.041)	(0.039)	(0.050)	(0.037)	(0.011)	(0.013)	(0.024)	(0.022)	(0.022)	(0.022)
Head completes post-secondary school	0.314***	0.259***	0.379***	0.441***	0.461***	0.510***	0.218***	0.329***	0.479***	0.924***	0.181***	0.289***
	(0.017)	(0.008)	(0.050)	(0.050)	(0.069)	(0.052)	(0.018)	(0.018)	(0.057)	(0.048)	(0.053)	(0.050)
Head completes college	0.601***	0.594***	0.793***	0.797***	0.636***	0.678***	0.422***	0.586***	1.244***	1.125***	0.510***	0.638***
	(0.011)	(0.011)	(0.051)	(0.046)	(0.064)	(0.045)	(0.017)	(0.016)	(0.032)	(0.031)	(0.035)	(0.032)
Urban	0.307***	0.278***	0.132***	0.166***	0.169***	0.038	0.093***	0.231***	0.434***	0.408***	0.419***	0.470***
	(0.007)	(0.007)	(0.031)	(0.029)	(0.031)	(0.025)	(0.008)	(0.008)	(0.015)	(0.015)	(0.015)	(0.015)
Constant	6.536***	6.187***	6.814***	6.786***	7.566***	7.223***	6.671***	6.732***	6.541***	6.593***	6.983***	6.016***
	(0.019)	(0.020)	(0.085)	(0.077)	(0.097)	(0.074)	(0.023)	(0.026)	(0.051)	(0.046)	(0.034)	(0.043)
Adjusted R2	0.299	0.282	0.155	0.210	0.086	0.108	0.050	0.135	0.339	0.343	0.126	0.192
N	16945	17066	1962	1904	1662	2891	20985	21187	7440	7566	10282	8623
Estimates for chronic poverty	13.3		1.04		0.12		7.26		1.2		28.27	
using synthetic panels	(0.08)		(0.03)		(0.00)		(0.03)		(0.03)		(0.14)	

Note: *p<0 .1, **p<0.05, ***p<0.01. Standard errors are in parentheses. Household heads' ages are restricted to between 25 and 55 for the first survey round and adjusted accordingly for the second survey round.

Table 1.3: Vulnerability Lines at Given Vulnerability Indexes

(1)	(2)	(3)	(4)	(5)	(6)
No	**Vulnerability index (%)**	**Vulnerability line (2005 PPP)**	**Increase (%)**	**Pop. share with consumption above poverty line but less than V-line in first period (%)**	**N**
1	35	2.8	40	14.4	40350
2	33	2.9	45	16.3	39197
3	32	3.00	50	18.3	38092
4	30	3.1	55	20.1	37018
5	29	3.2	60	21.9	36001
6	28	3.3	65	23.6	34992
7	27	3.5	75	26.9	33013
8	26	3.6	80	28.5	32092
9	25	3.7	85	30.0	31182
10	24	3.9	95	32.9	29437
11	23	4.1	105	35.6	27845
12	22	4.3	115	38.0	26328
13	21	4.6	130	41.4	24206
14	20	4.9	145	44.4	22391
15	19	5.3	165	47.9	20150
16	18	5.7	185	51.0	18259
17	17	6.3	215	54.7	15692
18	16	7.2	260	59.0	12811
19	15	8.4	320	62.8	9668
20	14	11.2	460	67.6	5575

Note: Vulnerability lines are estimated for the region as a whole. Relative increases of the vulnerability line from the poverty line is shown under the column "Increase" (column 4). All numbers are estimated with synthetic panel data and weighted with population weights. Household head's age range is restricted to between 25 and 55 for the first survey and adjusted accordingly for the second survey in each period. The incremental value for iteration is 10 cents/ day in 2005 PPP dollar.

Table 1.4: Shared Prosperity and Growth in Consumption for Each Country (percentage)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
No	**Country**	**Growth in mean consumption for each welfare category**			**Pro-poor growth scenario**	**Growth in mean consumption**
		Bottom 40%	**Middle 40%**	**Top 20%**		
1	Syria	14.9	5.7	31.5	most positive	96.4
2	Tunisia	5.1	2.4	-5.4	more positive	15.2
3	Palestine	3.8	-0.3	2.2	more positive	4.7
4	Jordan	2.0	-0.7	-2.8	positive	-1.5
5	Egypt	-4.0	-1.6	-1.5	more negative	-12.6
6	Yemen	-10.3	-3.8	17.3	more negative	-25.9
	Average	1.9	0.3	6.9	most positive	12.7

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights. Household heads' age is between 25 and 55 in the first survey round and adjusted accordingly for the second survey round. The thresholds that identify the Poor and Vulnerable groups are respectively the 40th and 80th percentile of the income distribution in the first period. These thresholds are kept unchanged for the second period. Pro-poor growth scenarios are based on the classification provided in Table 1. Countries are ranked first in a decreasing order of pro-poor growth scenario, and then in an increasing order of growth in the population share of the bottom 40 percent and middle 40 percent.

Table 1.5: Satisfaction Transition Dynamics Based on Synthetic Panel Data, MENA 2009-2012 (percentage)

		2012			
		Unhappy	**Less Happy**	**Happy**	**Total**
2009	**Unhappy**	29.9	7.2	1.3	38.4
		(0.1)	(0.0)	(0.0)	(0.1)
	Less Happy	16.0	14.6	6.5	37.1
		(0.0)	(0.0)	(0.0)	(0.0)
	Happy	3.6	8.8	12.2	24.5
		(0.0)	(0.0)	(0.0)	(0.0)
	Total	49.5	30.5	20.0	100
		(0.1)	(0.0)	(0.1)	

Note: Authors' calculation are based on Gallup Poll survey data. All numbers are estimated with synthetic panel data and weighted with population weights, where the second survey round is used as the base year. Bootstrap standard errors in parentheses are estimated with 1,000 bootstraps. Respondents' age is between 15 and 55 in the first survey round and adjusted accordingly for the second survey round. The satisfaction thresholds that identify the Happy and Less Happy groups are provided in Table 2. Estimation sample sizes are 26,844 individuals from 16 countries.