

Review of Income and Wealth
Series 64, Number S1, October 2018
DOI: 10.1111/roiw.12389

WELFARE DYNAMICS WITH SYNTHETIC PANELS: THE CASE OF THE ARAB WORLD IN TRANSITION

BY HAI-ANH H. DANG*

Survey Unit, Development Data Group, World Bank; Center for Analysis and Forecast, Vietnam Academy of Social Sciences

AND

ELENA IANCHOVICHINA#

The Chief Economist's Office of the Latin America and the Caribbean Region, the World Bank

This paper studies welfare dynamics, especially changes associated with middle-class status in Arab countries. Absent panel data, we construct synthetic panels using repeated cross sections of household expenditure surveys and subjective wellbeing surveys conducted during the 2000s and early 2010s. Objective welfare dynamics indicate mixed trends. About half of the poor in the 2000s moved out of poverty by the end of the decade, but chronic poverty remained high; upward mobility was strong in Syria and Tunisia, but downward mobility was pronounced in Yemen and Egypt. The analysis with subjective wellbeing data suggests negative developments in most countries during the Arab Spring transitions and provides evidence on the eroding middle-class consensus in Arab countries before and after the Arab Spring. Low education achievement, informal worker status, and rural residency are positively associated with lower chances for upward mobility and greater chances for downward mobility for both types of welfare measures.

JEL Codes: D31, I30, I31

Keywords: Arab Spring, middle class, poverty, synthetic panel, vulnerability

1. INTRODUCTION

Analysis of welfare dynamics plays a crucial role in the design of development policies. 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 two rounds of cross sectional household surveys indicate a slightly

Note: We would like to thank the editor Stephan Klasen, two anonymous reviewers, Ragui Assaad, Martijn Burger, Sami Bibi, Hadi Salehi Esfahani, Francisco Ferreira, Ravi Kanbur, Peter Lanjouw, Norman Loayza, and participants at a workshop for the MENA Inequality Report (Washington, DC), the IARIW-CAPMAS conference (Cairo, Egypt), DECRG Hub seminar (Kuala Lumpur, Malaysia), and the NEUDC conference (MIT) for helpful discussions on earlier versions. We would like to thank the UK Department of International Development for funding assistance through its Strategic Research Programs. The findings and interpretations in this paper do not necessarily reflect the views of the World Bank, its affiliated institutions, or its Executive Directors.

*Hai-Anh H. Dang, Economist with the Survey Unit, Development Data Group, World Bank and non-resident Senior Research Fellow, Center for Analysis and Forecast, Vietnam Academy of Social Sciences (hdang@worldbank.org; corresponding author);

#Ianchovichina, Lead Economist and Deputy Chief Economist, the Chief Economist's Office of the Latin America and the Caribbean Region, the World Bank (eianchovichina@worldbank.org).

© 2018 International Association for Research in Income and Wealth

decreasing headcount poverty rate. This net fall in poverty certainly indicates progress in the right direction, but does not offer any insights on the nature of poverty mobility. It may be characterized by either a situation of extreme volatility in which nearly all the poor households in the first period escape poverty but are replaced by households that were non-poor in the first period, or a situation of near stagnation in which most households see no change in their welfare.

The policies required to deal with these very different situations are also distinctly different. While strong social protection programs would most effectively address transitory poverty (as they help prevent the non-poor but vulnerable households from falling into poverty), chronic poverty may only be ameliorated with longer-term investments in human capital and infrastructure.¹ Thus, analysis of welfare dynamics is an integral part of a well-informed development policy strategy. Furthermore, it is also relevant for policies aimed at achieving economic prosperity and stability, especially regarding the welfare dynamics of the middle class. Defined by Easterly (2001) as a high share of income for the middle class and a low degree of ethnic divisions, middle-class consensus has been associated with higher growth, greater development achievement, less political instability, and fewer civil wars. Consequently, negative middle-class welfare dynamics, or a middle class that is being hollowed out, may signal eroding middle-class consensus.

We make use of different sources of survey data to advance our knowledge on several aspects of welfare dynamics for the Middle East and North Africa (MENA) region during the transition period spanning the Arab Spring. In particular, we assess the rate of chronic poverty and the extents of downward mobility and upward mobility as well as the characteristics of individuals (households) associated with these patterns. A clearer understanding of these issues is crucial for effective policy advice on poverty and inequality reduction, but it is not available for the region to date.

The MENA region presents an interesting case for analysis for a number of reasons. There is a high degree of cross-country heterogeneity in the region in terms of per capita income levels and poverty incidence: poverty rates range from less than one percent in the middle-income Palestine territories to more than 50 percent in low-income Yemen (using the international poverty line of \$2/day). Yet, the region has been undergoing major changes with the Arab Spring events affecting most Arab countries. Against this backdrop, our multi-country welfare dynamics analysis is among the first studies that shed light on the changes in welfare of different income groups and the characteristics of groups experiencing these changes during the years spanning the Arab Spring.

Notably, this is also the first study to provide empirical evidence on the erosion of middle-class consensus in many Arab countries during the decade preceding the Arab Spring, which is an aspect important to understanding the reasons behind the Arab Spring unrest (Devarajan and Ianchovichina, forthcoming). We seek to deepen our understanding of welfare dynamics in Arab countries by combining both objective measures (i.e. money-metric indicators of poverty) and subjective measures (i.e. life evaluation using “Cantril Ladder” scores). Subjective welfare measures are a good alternative to and can complement monetary welfare measures since the latter

¹See, e.g., Barret (2005) and Ravallion (2016) for further discussion on different policy interventions regarding chronic poverty versus transitory poverty.

do not reflect many factors affecting wellbeing such as job satisfaction, the quality of public services (e.g. health, education, transportation, and control of corruption), the environment, and expectations about the future. Relying exclusively on objective data to measure welfare dynamics accurately can be misleading as suggested by Easterlin's "unhappy growth" paradox (see, e.g. Stevenson and Wolfers (2008), Graham and Lora (2009), Easterlin et al., (2010)) in general, and the "unhappy development" paradox observed by Arampatzi et al. (forthcoming) in Arab countries in particular during the period preceding the Arab Spring.² Using both types of measures therefore is a good way to obtain a more comprehensive picture on welfare dynamics. Furthermore, the few existing studies that combine objective and subjective data focus on static rather than dynamic analyses of welfare outcomes.³

In our empirical analysis, we use two sets of tools that have recently been developed. First, for the purpose of exploring the dynamics underlying the changes of the middle class, we not only split the population into poor and non-poor to study movements in and out of poverty, but we also divide the population into three groups. The low-income group represents the poor; the middle-income group represents the vulnerable to falling into poverty (and some of the lower middle class); finally, the top-income group represents mostly the middle class and the affluent.⁴ In the process, we use a novel approach developed by Dang and Lanjouw (2017) to defining the income groups, which also allows us to estimate the size of the middle class in developing MENA.

Defining the middle class is not a straightforward task and has not been done in a plausible way for this region. A review of approaches to estimating the size of the middle class by Abu-Ismaïl and Sarangi (2009) indicates that the estimated size of the middle class in the MENA region varies dramatically depending on the thresholds used to identify middle-class individuals.⁵ It is estimated to be implausi-

²For 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). Observed income inequality did not increase between 2000 and 2009, but inequality aversion increased during the same period as people felt poorer in 2008 than they did in 2000. See also Ravallion (2012) for an overview of the use of subjective data in measuring poverty, and Dolan, Peasgood and White (2008) and Graham (2010) for recent surveys of studies on happiness; Veenhoven (2002) argues that subjective indicators are important for policy makers for a variety of reasons. Another branch of the literature—introduced by the Nobel prize laureate Amartya Sen—proposes a capability approach that instead promotes "the progress of human freedom and capability to lead the kind of lives that people have reason to value" (Dreze and Sen, 2013). See also Alkire et al. (2014) for a recent discussion on the related measure of multidimensional poverty index.

³All objective data available to us are for the period before the Arab Spring. We thus have to limit our analysis with objective data to the pre-Arab-Spring period, although we analyze subjective well-being data spanning the Arab Spring transition.

⁴We proxy income with expenditure data and use interchangeably the pairs of terms "income" and "consumption" and "(un)happiness" and "(dis)satisfaction". Unless otherwise noted, we also refer to "income/ monetary poverty" as "poverty" in this paper.

⁵Different approaches have been used to define the middle class. Relative definitions, which rely on thresholds based on deviations from the economy's median per capita income, mostly provide information about the middle strata in income terms in each country. Such definition may be inappropriate because the median income may lie below the nationally defined poverty line. Absolute definitions rely on fixed thresholds and PPP exchange rates, which arguably do not appropriately adjust purchasing power across countries (Deaton 2010) and will have to differ across countries to be useful for making inferences about the size of the middle class in a region where there are poor, lower-middle income, higher middle-income, and rich countries. Some authors arbitrarily pick a certain multiplication of the poverty line to define those who are relatively secure from falling into poverty; see Dang and Lanjouw (2017) for more discussion.

bly small in Birdsall (2007) and Ferreira et al. (2013) representing less than 5 percent of the regional population, but is implausibly large, accounting for close to 80 percent of the population in Ravallion (2010), Chun (2010), and Ali (2011). Using a vulnerability approach, which allows us to identify the percentage of the non-poor who are less likely to fall into poverty and who therefore are stably middle class, we find the size of the middle class to vary by country in our sample, but averages around 40 percent of the regional population.

Second, one major obstacle that hinders the analysis of welfare dynamics in the Arab countries is the ubiquitous absence of panel household survey data. Even when such panel surveys exist, they are often plagued by data quality issues such as attrition bias.⁶ We overcome the lack of actual panel data in the Arab countries by constructing synthetic panels from repeated cross sectional survey rounds using the methods developed in Dang et al. (2014) and Dang and Lanjouw (2013). These synthetic panels allow us to examine the movements among different welfare categories and since these panels are constructed from fresher rounds of the repeated cross sections, they are (much) less affected by the issues discussed above.⁷ Our findings highlight the value added of undertaking welfare dynamics analyses with synthetic panels using both objective expenditure data and subjective wellbeing data from micro survey data. Results suggest strong upward mobility for objective welfare in Tunisia and the Syrian Arab Republic, and downward mobility in Yemen and the Arab Republic of Egypt. However, the analysis with subjective wellbeing data suggests that in most countries the share of dissatisfied people increased while those of the happier groups declined in almost all countries, especially in the Arab Spring countries (Egypt, Syria, Tunisia, and Yemen) where the uprisings were most intense.⁸ We also find that certain characteristics such as low education achievement, informal work, and rural residence are negatively associated with upward mobility and positively associated with downward mobility according to both objective and subjective welfare measures.

The remainder of this paper is organized in four sections. We provide a brief overview of the framework of analysis in Section 2, discuss the data and the regional context in Section 3, present the results in Section 4, and offer policy discussion and concluding remarks in Section 5.

2. METHODOLOGY

2.1. *Overview of Synthetic Panel Methods*

We rely on methods for constructing synthetic panels developed by Dang et al. (2014) and Dang and Lanjouw (2013). These methods differ from the

⁶Attrition bias occurs when some households drop out of the sample in follow-up survey rounds.

⁷In addition, the definition of “panel data” may itself vary for different contexts. For example, a panel may be defined based on whether the household head remains the same or whether the residence, where the data are collected, remains the same. Our analysis is not affected by this issue since we construct the synthetic panels for all countries using the same method.

⁸In Syria and Yemen, where the uprisings grew into civil wars, the declines in subjective well-being measures capture the human toll of the wars. See Ianchovichina (2016) for details on the costs of the post-Arab Spring wars in MENA.

literature on pseudo-panel data in two major ways—as few as two rounds of repeated cross sections are required to construct the synthetic panels and these panels are created at a more disaggregated level than pseudo panels. The synthetic panel methods are broadly related to the literatures on survey-to-census imputation (see, e.g. Elbers et al. (2003)) and survey-to-survey imputation (see, e.g. Dang et al. (2017)). Recent applications or validations of synthetic panel 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, Dang and Lanjouw (forthcoming) for India, and Dang and Dabalén (in press) for Sub-Saharan African countries.

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 , $i=1, \dots, N$. 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 can be roughly categorized into three types: i) time-invariant variables such as ethnicity, religion, place of birth, or parental education; ii) deterministic variables such as age which can be computed given the value in one survey round and the time interval between the two survey rounds;⁹ and iii) 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

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

If z_j is the poverty line in period j , then we are interested in estimating the percentage of households that are poor in the first (or previous) period but non-poor in the second (or current) period

$$(2a) \quad P(y_{i1} \leq z_1 \text{ and } y_{i2} > z_2),$$

as well as the percentage of poor households in the first period that escape poverty in the second period

$$(2b) \quad P(y_{i2} > z_2 | y_{i1} \leq z_1).$$

⁹To reduce spurious changes due to changes in household composition over time, we restrict the estimation samples to household heads who are 25 to 55 years old in the first cross section and adjust their age accordingly in the second cross section in all the subsequent analysis. This restriction also helps ensure that certain variables such as the household heads' education attainment remains relatively stable over time, assuming these household 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. Headcount poverty rates without the age restriction (Table 1) are very similar to those with this restriction (Table 3). The Gallup World Poll Survey collects individual data for people who are 15 years or older, thus in order to keep reasonable sample sizes we restrict the sample to individuals who are 15 to 55 years old.

TABLE 1
SURVEY YEARS, HEADCOUNT POVERTY AND DISSATISFACTION FOR EACH COUNTRY

(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Objective well being					
No	Country	Survey name	Survey years	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					
Panel B: Subjective well being					
No	Country	Survey name	Survey years	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					

Note: Authors' calculation based on cross sectional 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).

For the average household, quantity (2a) provides the joint (unconditional) probability of household poverty status in both periods and quantity (2b) defines the conditional probability of household poverty status in the second period given their poverty status in the first period. Put differently, using panel data, (2a)-type and (2b)-type quantities provide the gross changes of poverty over time, adding a dynamic and more nuanced picture to the net change of poverty that “cannot be obtained by simply 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 (Assumption 1). Coupled with equation (1), this assumption implies that the conditional distribution of expenditure in a given period remains unchanged whether it is conditioned 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). Put differently, given Assumption 1, the time-invariant characteristics are the same regardless of which cross sectional round they are in, thus they can work as connectors of the two rounds of cross sections to help convert them into synthetic panels. Assumption 1 is testable using data from the cross sections, and we return to a discussion of this issue in Section 4.1.

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 (Assumption 2). This assumption helps render the mathematical derivations more tractable and operationalize the estimation framework (by using the bivariate normal cumulative distribution function to estimate quantities 2a, see below). It appears to be the norm, rather than the exception, that ε_{i1} and ε_{i2} are positively correlated in most household expenditure surveys.

For example, examining multiple rounds of actual panel data from seven countries at different income levels and in different geographical locations, Dang et al. (2014) and Dang and Lanjouw (2013) find that ρ ranges from 0.4 to 0.7. This concurs with findings from earlier studies.¹⁰ But unlike Assumption 1, Assumption 2 is not testable without actual panel data. In the absence of such data, we can only implement a partial test for Assumption 2 with a test for the univariate normal distribution for the two cross sections.¹¹ One useful way to check on both Assumptions 1 and 2 (as well as the overall fit of the estimation model) is to impute using both the survey rounds separately as the base year and then compare estimation results. If estimates are very similar, this would provide supportive evidence;

¹⁰Analyzing longitudinal earning data from the US’s Social Security Administration between 1937 and 2004, Kopczuk et al. (2010) also finds that the (rank) correlation of earnings is positive. This result also holds for data from other countries such as China (Khor and Pencavel, 2006), India (Chaudhuri and Ravallion, 1994), and the UK (Jenkins, 2011).

¹¹While the bivariate normality assumption of the error terms is often failed by formal tests, this assumption is rather standard and commonly made in modelling household consumption data. See Dang and Lanjouw (2013) and Dang et al. (2014) for further discussion on these assumptions and estimates based on alternative non-parametric methods; asymptotic results and formulae for the standard errors are provided in Dang and Lanjouw (2013).

we return to the discussion of this test in the section on the empirical results. But more importantly, the ultimate test for both Assumptions 1 and 2 is whether the estimates for poverty dynamics based on the synthetic panels can reasonably approximate those based on the actual panel data; this test can be implemented in contexts where the latter were available.

Quantity (2a) can then be estimated for each household by

$$(3) \quad P(y_{i1} \leq z_1 \text{ and } y_{i2} > z_2) = \Phi_2 \left(\frac{z_1 - \beta'_1 x_{i2}}{\sigma_{\varepsilon_1}}, -\frac{z_2 - \beta'_2 x_{i2}}{\sigma_{\varepsilon_2}}, -\rho \right),$$

where $\Phi_2(\cdot)$ stands for the bivariate normal cumulative distribution function (cdf). 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 cohort-aggregated household consumption between the two surveys. For prediction purposes, 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), but we can use data from the first survey round 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 $\Phi(\cdot)$ stands for the univariate normal cumulative distribution function (cdf). A detailed step-by-step estimation procedure to obtain these estimates from the cross sectional data is provided in Appendix 2 of Dang and Lanjouw (2013).

To gain further insight into the nature of poverty mobility, we decompose below the poverty rate in the first period

$$(4) \quad P(y_{i1} \leq z_1) = P(y_{i1} \leq z_1 \text{ and } y_{i2} \leq z_2) + P(y_{i1} \leq z_1 \text{ and } y_{i2} > z_2)$$

and second period

$$(5) \quad P(y_{i2} \leq z_2) = P(y_{i1} \leq z_1 \text{ and } y_{i2} \leq z_2) + P(y_{i1} > z_1 \text{ and } y_{i2} \leq z_2)$$

Several remarks are in order. First, in equation (4), the first and second terms on the right-hand side of the equation respectively represent the rate of chronic poverty (i.e. the incidence of those who remain poor in both periods) and upward mobility (i.e. those who were poor in the first period but who became nonpoor in the second period). In equation (5), these two terms respectively represent the rate of chronic poverty and downward mobility (i.e. those who were nonpoor in the first period but became poor in the second period). Second, if the poverty rate stays constant between the first and second periods, equation (4) (or (5)) implies an inverse relationship between chronic poverty and upward mobility (or downward mobility). Finally, the decomposition shown in equations (4) and (5) shows the unconditional versions of poverty mobility; for the conditional versions, we can simply divide the terms on both sides of each equation by the term on the left-hand side. An interesting implication of employing the conditional versions of poverty mobility is that, the rate of chronic poverty can differ depending on whether we refer to equation (4)

(period 1) or equation (5) (period 2).¹² This stands in contrast to the constant rate of chronic poverty in both periods for the unconditional version.

2.2. *Welfare Thresholds and Dynamics*

We follow a new approach in setting the welfare thresholds (lines) that define the different income groups (i.e. the low-income, middle-income, and top-income groups). As poverty rates are generally declining due to rising global living standards, policy makers have paid increasingly more attention to the segments of the population that are not poor, but whose situation is such that they face a heightened risk of falling into poverty. Put differently, these population groups are currently above the poverty line, but since they are vulnerable to falling into poverty, they cannot be characterized as stably belonging to the middle class. Indeed, the probability that individuals in these population can slide into poverty can vary and increases the closer their incomes are to the poverty line. This probability measures these individuals' vulnerability to poverty and it is called the vulnerability index P , which is formally defined as the percentage of the non-poor population in the first period that fall into poverty in the second period (Dang and Lanjouw, 2017). Departing from the current practice of selecting an arbitrary fixed threshold for the region, Dang and Lanjouw (2017) propose a conceptually different approach that derives the vulnerability line from a specified vulnerability index P . Specifically, this approach employs the existing (national or international) poverty line to define the category of the poor. It then further disaggregates the non-poor group into two subcategories: one group is the vulnerable, who are defined as those currently non-poor but facing a significant risk of falling into poverty in the next period (i.e. this group includes also people who belong to the low middle-income group), and the remaining group of people who belong to the middle class and to the group of the affluent.

A (very) simple example can be useful to help illustrate the use of P in reaching a desired social protection target, given the available budget. Assume that the total population consists of 1,000 households, where the poverty rate is 20 percent (i.e., 200 households are poor). Also assume that in this population, another 200 vulnerable households are currently non-poor, but have a high risk of falling into poverty, and these households can be made secure with a monthly transfer of \$10 per household. Thus, the vulnerability index in this simple scenario is 25 percent (i.e. dividing 200 households that can be aided and that would have fallen into poverty without the government's support over the total of 800 non-poor households).

If the government has enough budget to prevent all these 200 non-poor households from falling into poverty, it can reduce the vulnerability index to zero. On the other hand, if the government only has enough resources to prevent 100 vulnerable households from sliding into poverty, it can reduce the vulnerability index to 12.5 percent (i.e. dividing the remaining 100 vulnerable households over the total of 800 non-poor households). A zero-vulnerability index is certainly better than the 12.5 percent vulnerability index, and indicates no household is vulnerable to falling

¹²For the unconditional versions of poverty mobility, chronic poverty is the same and represented by the first term on the right-hand side of both equations (4) and (5). See Dang and Dabalén (in press) for more variants on decomposing the poverty rates in both periods.

into poverty. However, the former would require a larger social transfer budget of \$2,000 (=200*\$10), compared with the smaller budget of \$1,000 for the latter.

The process for obtaining the vulnerability line V_1 consists of two steps. The first step is to identify a range of values for the vulnerability index and then select an appropriate value for the index which could be done based on different criteria such as the government’s available budget for social protection, the (ideal or desirable) social welfare objectives, or relative concepts of well-being. Given the specified vulnerability index P obtained in the first step, the second step is to empirically solve for the vulnerability line V_1 from this equality

$$(6) \quad P = P(y_2 \leq z_2 | z_1 < y_1 \leq V_1),$$

which indicates that the vulnerability line is the highest income level among the currently nonpoor who have a specified probability of falling into poverty in the next period.¹³ Thus, given two income thresholds (z_j and v_j), we can extend expression (2a) to analyze the mobility across 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

$$(7) \quad \begin{aligned} & P(y_{i1} \geq z_1 \text{ and } z_2 \leq y_{i2} < v_2) \\ & = \Phi_2 \left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\epsilon_1}}, \frac{v_2 - \beta_2' x_{i2}}{\sigma_{\epsilon_2}}, \rho \right) - \Phi_2 \left(\frac{z_1 - \beta_1' x_{i2}}{\sigma_{\epsilon_1}}, \frac{z_2 - \beta_2' x_{i2}}{\sigma_{\epsilon_2}}, \rho \right) \end{aligned}$$

Equation (7) also represents the percentage of the population in the lowest income group in the first period that moves to the middle-income group in the second period.¹⁴

3. DATA, SETTING WELFARE THRESHOLDS, AND REGIONAL CONTEXT

3.1. Data

In this paper we analyze household surveys for six Arab economies, including Egypt, Jordan, Palestine territories, Syria, Tunisia, and Yemen. These

¹³This vulnerability approach is different from previous ones in the literature in several respects. First, it provides a new and explicit framework to estimate the vulnerability line, which is associated with a vulnerability index that can be derived in various and more flexible ways. Second, the target population consists of the currently non-poor households rather than all households. Finally, this approach employs simpler non-parametric estimation methods to estimate vulnerability as a function of consumption alone, and can work with either actual panel data or synthetic panel data that can be constructed from cross sections. See also Dang and Lanjouw (2017) for a more detailed comparison of this approach with other approaches.

¹⁴This approach has a strong focus on pro-poor growth. We also offer an alternative definition that 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 define 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. The estimation results are qualitatively similar and available in the working paper by Dang and Ianchovichina (2016).

surveys have been harmonized for comparability both across countries and within countries over time using methodologies developed by the World Bank, the Luxembourg Income Study, OECD, and country statistical offices, as described in greater detail in Hassine (2015). All expenditure data used in this analysis have been deflated by the CPI of the respective economy and year, and adjustments for spatial price differences have been made for Egypt, Syria, and the Palestine territories.¹⁵ To facilitate comparison of consumption expenditure levels across countries, the PPP conversion factor for private consumption (LCU per international dollar), obtained from the World Development Indicators database (World Bank, 2015), is employed to convert expenditure data into 2005 PPP dollars. Only in the case of the Palestine territories, the PPP conversion factor for GDP is used instead.

The household surveys cover different years for different countries. The surveys for Egypt, Jordan, the Palestine territories, and Tunisia have been conducted in the mid-to-late 2000s, but in the cases of Syria and Yemen they were implemented in the late 1990s to the mid-2000s. Panel A of Table 1 shows details on each country, including the names of the surveys, the survey years, and the headcount poverty rates for the first and last years in the survey period. The time length between the 1st and 2nd periods varies from country to country. It is longest for Yemen and Syria (6 to 7 years) and shortest for Jordan (2 years); in all other cases the time period spans 3 to 4 years.¹⁶

In order to assess welfare dynamics with alternative, subjective welfare measures, we employ data on subjective wellbeing from the Gallup World Poll for the period from 2009 to 2012. The annual Gallup World Poll contains nationally representative country samples of at least 1,000 randomly selected respondents who are 15 and older. Since most of the variables obtained from the Poll and employed in the construction of the synthetic panels are only collected in 2009 or after, we focus on the period from 2009 to 2012 and include all Arab countries for which we have subjective wellbeing information. For the regional analysis, we construct the synthetic panel using data from 16 countries, including the Arab Spring countries (Egypt, Libya, Syria, Tunisia, and Yemen) and other countries (Algeria, Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Morocco, Qatar, Saudi Arabia, and United Arab Emirates), but for the country-level analysis we focus on only nine countries with larger sample sizes, shown in Panel B of Table 1 (i.e., Algeria, Egypt, Iraq, Jordan, Lebanon, Morocco, Syria, Tunisia, and Yemen).¹⁷ However, we also offer stylized 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). In the cases of Egypt and Jordan we can compare directly the evolution of

¹⁵The absence of spatial price differentials prevented adjustments for regional price differentials in Jordan, Tunisia, and Yemen.

¹⁶We acknowledge that these varying time lengths between the survey rounds can render estimation results less comparable for different countries. But in practice, it is perhaps rare for countries to implement surveys either at the same point in time or over the same time interval. Given the available data, the comparison across countries should be taken with caution.

¹⁷We do not make comparisons of monetary and subjective wellbeing indicators at the regional level due to the different time intervals and country compositions in the two databases.

wellbeing because the data on subjective wellbeing for these countries date back to 2005 and overlap with objective wellbeing data.

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

“Please imagine 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.¹⁸ Dissatisfaction rates by country in the first and last year of the survey period are shown in Panel B of Table 1.

3.2. *Setting Welfare Thresholds*

We employ the thresholds of PPP\$2/day and PPP\$4.9/day for the poverty and the vulnerability lines in 2005 PPP\$, respectively.¹⁹ The latter corresponds to a vulnerability index of 20 percent, which is comparable to vulnerability analyses done for other countries, including India, the United States, and Vietnam (Dang and Lanjouw, 2017, 2016, 2013 and forthcoming; Rama et al., 2015).²⁰ This definition implies that the low-income group represents the poor, the middle-income group captures the vulnerable (and perhaps some of the lower middle class), and the top-income group depicts mostly the middle class and the affluent in Arab countries. Our estimates of the population shares for each income group in the 1st period, shown in Table 2, show that the size of the middle class substantially varies across Arab countries, but hovers around 36 percent of the regional population.²¹ The middle class is smallest in Egypt and Syria, where it is estimated to be close to 10 percent of the population, and is largest in the Palestine territories and Tunisia, where the majority of the population is middle-class. Thus, unlike the existing literature, this new approach allows us to define a more plausible size for

¹⁸The Gallup Poll also collects data on self-reported income. But since this variable is much less meticulously constructed compared to household consumption data in the household surveys, we do not construct synthetic panel data for income. We come back to this issue in the next section.

¹⁹Given 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 national absolute poverty thresholds for Syria and Egypt, although it is above the national absolute poverty lines in Yemen and below the national poverty lines in Tunisia, Jordan, and the Palestine territories.

²⁰See Table 1.3 in Appendix 1 for a range of vulnerability indexes and vulnerability lines for the whole region. For example, the vulnerability line of PPP\$4.9/day represents a 145-percent increase from the poverty line of PPP\$2/day (Table 1.3, column 4). Around 44 percent of the population in the MENA region are thus vulnerable, with a consumption level above the poverty line but below the vulnerability line (Table 1.3, column 5).

²¹The regional averages are simple (unweighted) averages. The middle class increases to slightly more than 40 percent of the regional population in the second period (Table 1.5, Appendix 1).

TABLE 2
POPULATION SHARE BY WELFARE CATEGORY (PERCENTAGE)

(1)	(2)	(3)	(4)	(5)	(6)
Population share of each welfare category in 1st period					
No	Country	Poor	Vulnerable	Middle Class	Total
1	Palestine	1.4	23.0	75.5	100
2	Jordan	4.3	46.2	49.5	100
3	Tunisia	9.4	39.9	50.7	100
4	Egypt	20.2	65.5	14.3	100
5	Yemen	32.3	50.7	17.0	100
6	Syria	40.5	50.6	8.9	100
Average		18.0	46.0	36.0	100

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights, except that the regional average is a simple average (unweighted). 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 corresponds to a vulnerability index of 20 percent. Countries are ranked first in a decreasing order of poverty and then vulnerability.

the middle class in the region and to come up with specific estimates of the middle class in each country.

We follow the Gallup World Poll (2013) and define the unhappy (or dissatisfied/suffering) group as those with a life evaluation score of 4 and below.²² Given this “poverty” line (or dissatisfaction threshold) for subjective wellbeing, we can define the vulnerability line for the subjective welfare measure in a similar way as with the objective welfare measure. However, since the subjective welfare measure is a discrete variable that has only 10 values—which results in only a few practically usable values for the vulnerability line above the “poverty” line of 4—the range of vulnerability indexes that corresponds to these possible values of the vulnerability line would be discrete accordingly. For example, the vulnerability indexes include the range [24, 43] (see Table 1.4, Appendix 1). We choose a vulnerability index of 30 percent, which lies roughly mid-range of the available vulnerability indexes and yields a mid-range vulnerability line of 7. We then define the struggling group as those with life evaluation scores between 5 and 7, and the happy (or satisfied) with wellbeing scores of 8 or above. An alternative is to employ a vulnerability line of 6, which roughly corresponds to an index of vulnerability similar to the one employed in the objective wellbeing analysis. Dang and Ianchovichina (2016) present estimation results based on this alternative specification for the vulnerability line and these results are similar to the ones presented here.²³ The percentages of the dissatisfied in the first and second periods are shown for individual countries in Table 1.

²²Analysis conducted by Gallup World Poll (2013) using data sets with hundreds of thousands of respondents have indicated a pattern in the Cantril Scale data. These data suggest at least three distinct categories of life evaluations formed by (1) thriving people with well-being scores of 7 or above; (2) struggling individuals with scores between 4 and 7; and (3) suffering people with scores of 4 or below.

²³As a robustness check, we also provide analysis with a slightly different classification, where the unhappy (or dissatisfied/suffering) are defined as those with a life evaluation score of 5 and below, and the struggling as those with a life evaluation score between 6 and 7.

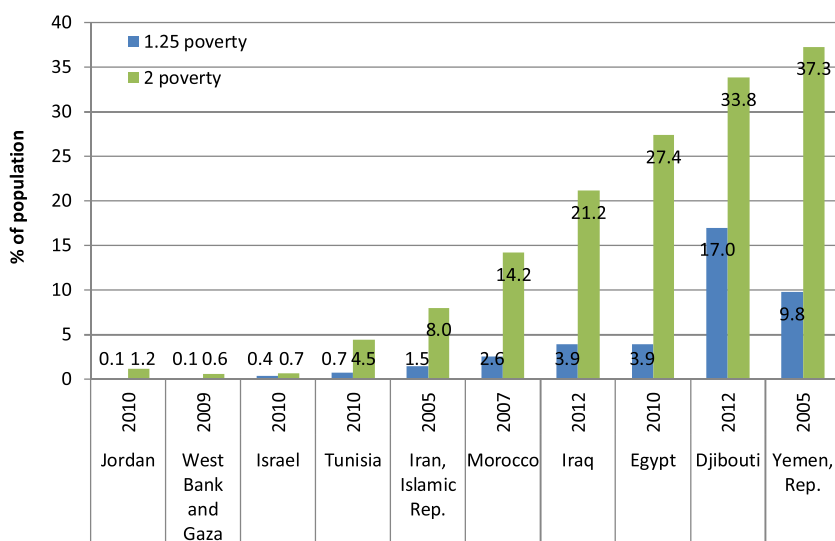


Figure 1. Poverty rates by country. *Source:* Vishwanath, Atamanov and Krishnan (2015). [Colour figure can be viewed at wileyonlinelibrary.com]

3.3. Regional Context

Extreme poverty defined at the \$1.25 a day (in 2005 PPP\$) was not an issue in the MENA region. The regional extreme poverty rate dropped below 2 percent between 2005 and 2011 and the extreme poverty line of \$1.25 did not reflect accurately the poverty situation in most middle-income Arab economies. However, the poverty rates in many of these countries, especially in Egypt, Yemen, Iraq, and Morocco, were much higher when the poverty rate was raised to \$2 a day (Figure 1). Therefore, in many Arab countries a large share of the poor was clustered just above the \$1.25 poverty line. Abu-Ismaïl and Sarangi (2013) also show that the equivalent of \$1.25 in current Egyptian currency was much below the value of the national extreme poverty line (or the absolute poverty line, also known as the food poverty line), estimated at \$2.3/day (in 2005 PPP\$) in 2011. Similarly in Syria the national absolute poverty line was estimated at \$2.2/day in 2003-04 (El-Laithy and Abu-Ismaïl, 2005).

Table 3 indicates some progress with poverty reduction in the 2000s. Poverty rates declined in Tunisia, Syria, Jordan and the Palestine territories and increased in Egypt and Yemen. The subjective wellbeing data, however, reveal a different picture from the household survey data. They show a deteriorating situation in the period before the Arab Spring, especially in countries where the uprisings were most intense (hence we refer to them as Arab Spring countries) (Figure 2, top panels), although we do not make strict comparisons of the quantitative changes observed in each country because of the differences in the survey years captured with the objective and subjective data for practically almost all the countries.²⁴ In

²⁴Data are not available for all countries in 2007. Therefore, we use data for 2006 for Lebanon and 2008 for Algeria, Iraq, Syria, and Tunisia. We also show estimates for only nine countries with larger sample sizes. Estimates using a larger sample including other countries provide qualitatively similar results.



Figure 2. Dissatisfaction Rates by Country, 2007-2012. [Colour figure can be viewed at wileyonlinelibrary.com]

many developing MENA countries, the percentage of dissatisfied (unhappy) people—those with life evaluation scores below the lower cutoff point of 4—was high and increased 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 population in Syria and Egypt were unhappy with their life (Figure 2, top panels). Importantly, unhappiness rates in Arab Spring countries were mostly higher than those in other countries in the region (Figure 2, top panels).

These results suggest that welfare dynamics analysis based on monetary measures may not always align with welfare dynamics analysis based on subjective measures of welfare. While Yemen experienced both increasing poverty (Table 3, column 8) and rising unhappiness (Figure 2) before the Arab Spring, in Syria and Tunisia falling poverty was registered at a time of rising dissatisfaction. To provide a further check, we plot in Figure 3 the poverty rate and the dissatisfaction rate for Egypt and Jordan for the years before 2010—the only two countries with objective and subjective wellbeing data dating back to 2005. Indeed, while both dissatisfaction and poverty rates were increasing in Egypt, in Jordan the dissatisfaction rate went up between 2005 and 2008, but the poverty rate went down during the same period.

Our findings are consistent with the mixed evidence in the literature on the linkage between (monetary) poverty and happiness. Poverty and unhappiness are found to not necessarily overlap in India (Banerjee and Duflo, 2007), Mexico

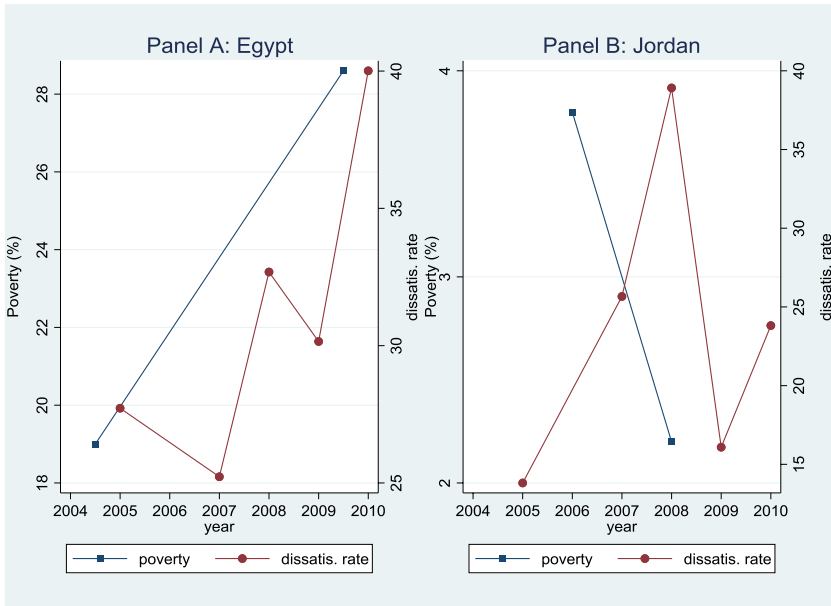


Figure 3. Poverty vs. satisfaction for Egypt and Jordan, 2004-2010. [Colour figure can be viewed at wileyonlinelibrary.com]

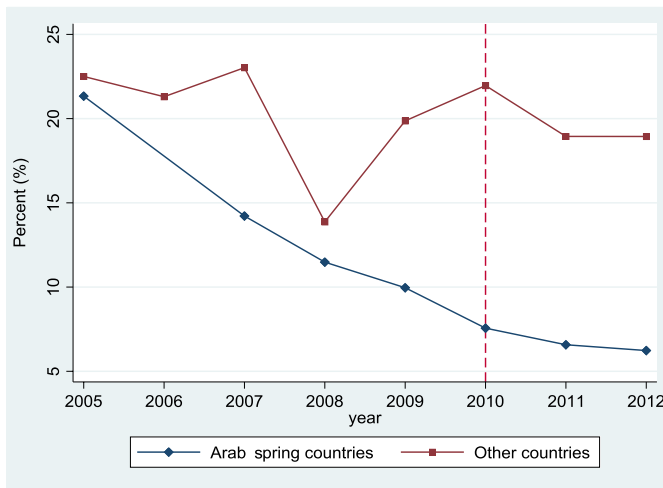


Figure 4. Percent of satisfied individuals in total population, 2005-2012. [Colour figure can be viewed at wileyonlinelibrary.com]

(Rojas, 2008), Peru and Russia (Graham and Pettinato, 2002), and various other countries (Graham, 2010). Importantly, while the size of the middle class increased in some countries according to estimations based on expenditure data (compare Tables 2 and Table 1.5 in Appendix 1), the share of satisfied individuals declined in nearly all Arab countries, with declines being most pronounced in the Arab Spring countries (Figure 4).

In the 2000s, it became evident that the fiscal deficits associated with public-sector employment and the subsidy payments were becoming unsustainable. Consequently, these subjective well-being data capture the increased frustration with symptoms of a broken social contract.²⁵ In particular, governments slowed down or stopped hiring workers and the quality of public services deteriorated considerably (Arampatzi et al., forthcoming), which resulted in the need to increase spending on private services (Devarajan and Ianchovichina, forthcoming). Learning outcomes were disappointing and teacher absenteeism rates in public schools in MENA were among the highest in the world (Brixi et al., 2015). Absenteeism rates among doctors in public clinics in Egypt and Yemen were also high, surpassing 30 percent (World Bank, 2013). Seeking quality education and health care, people were paying for private services. In Egypt, for instance, the proportion of students receiving tutoring was 70 percent. Therefore, expenditure increases did not necessarily indicate increases in welfare status.

Furthermore, dissatisfaction rates kept on deteriorating in nearly all developing Arab countries after 2010 and the deterioration in the Arab Spring countries was much larger than that in the rest of the Arab countries in our sample (Figure 2, bottom panels). 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 panels). In all other Arab developing countries, the deterioration has been moderate to mild.

Overall, the period between (around) 2007 and 2012 was a tumultuous one as dissatisfaction rates continued to increase in many Arab countries after the Arab Spring. Only in Morocco, average subjective wellbeing levels improved and the share of unhappy people declined markedly (Figure 2, bottom panels), reflecting the state's swift response with a combination of measures that sought to address grievances and improve political participation.²⁶ The next section explores the wellbeing dynamics using synthetic panel data.

4. ESTIMATION OF WELFARE DYNAMICS

4.1. *Welfare Dynamics with Monetary Measures*

We use the second survey rounds as the base year in our synthetic panel analysis but we explore the robustness of the results to changes in the base year. We do so by providing estimates for chronic poverty rates and their associated standard errors by using the first and the second survey rounds separately as the base year. Estimation results, shown in Table 1.1, Panel B in Appendix 1, suggest

²⁵As discussed in Devarajan and Ianchovichina (forthcoming), under the Arab social contract the state provided public-sector jobs, food and fuel subsidies, and free education and health.

²⁶Arampatzi et al. (forthcoming) find robust evidence of a significant, negative association between life satisfaction levels in the region in the years preceding the Arab Spring and each of the main perceived reasons for the 2011 uprisings – dissatisfaction with standards of living, poor labor market conditions and corruption. See also Amin et al. (2012) for a comprehensive discussion of various issues that affect the region after 2010.

that varying the base year leads to similar estimates; for example, using the second survey round for Yemen provides an unconditional chronic poverty rate of 28.3 percent, which is around 1 percentage point smaller than the corresponding figure based on the first survey round.²⁷ In all other cases, the differences between the estimates with the first and second survey rounds are small and are below 1 percentage point.

Using equations (4) and (5), Table 3 presents respectively the unconditional decomposition for the headcount poverty rate in panel A and the conditional version in panel B. In both panels, the poverty rate in the first period (column 3) is decomposed into two components: the chronic poverty rate (column 4) and the rate of upward mobility (column 5). Similarly, the poverty rate in the second period (column 6) is also decomposed into chronic poverty rate (column 7) and downward mobility rate (column 8). For comparison, the net change in poverty (Panel A, column 9) is obtained by simply subtracting the poverty rate in the first period from that in the second period.

Following our imputation method, we estimate that the six Arab countries performed on average reasonably well in terms of poverty mobility. Slightly more than half (53 percent; in Panel B, last row of column 5) of the poor in the first period were estimated to move out of poverty in the second period. Among the six Arab countries in our study, Yemen, Egypt, and Syria had the highest poverty rates, but unlike Syria, the poverty rate increased in Egypt and Yemen in the 2000s (Panel A, column 9). The estimation suggests that in Syria 82 percent of the poor (Panel B, column 5) moved out of poverty and only 18 percent of the poor remained chronically poor in the first period. This large degree of upward mobility implies that most of the poor (87 percent) were chronically poor in the second period. In contrast to Syria, Yemen and Egypt had lower estimated rates of upward mobility than downward mobility. The upward mobility rates in the remaining countries were fairly high at around 80 percent or more.

Next we turn to the welfare dynamics of the three income groups: the poor, the vulnerable, and the middle class. The welfare dynamics analysis allows us to understand trends in middle class dynamics rather than simply progress with poverty reduction. Estimation results, shown in Table 4, are broadly consistent with the poverty mobility trends discussed in Table 3. In particular, in Yemen and Egypt the low-income group expands and the middle and top-income groups contract. In Syria, only the low-income group shrinks as people move mostly up to the top-income status group (Table 4, columns 3 through 5). But in the cases of Tunisia and the Palestine territories,²⁸ both the low and middle-income categories contract, while the top-income group expands in size.

²⁷This table also provides the underlying regressions for the household consumption models (equation (1) and other parameters. For example, the partial correlation coefficient ρ is estimated based on these parameters and some combination of age cohorts (i.e. age cohorts for Egypt, Jordan, and the Palestine territories, age cohorts interacted with gender for Syria and Tunisia, and age cohorts interacted with education for Yemen). Similar regression results for the satisfaction model are shown in Table 1.2 in Appendix 1.

²⁸Note that the results for the Palestine territories should be interpreted with caution as much of the expenditure growth is driven by foreign aid rather than by sustainable economic activity.

TABLE 3
NET AND GROSS CHANGES IN POVERTY OVER TIME BY COUNTRY (PERCENTAGE), PRE-2010

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
Headcount poverty in 1st period			Headcount poverty in 2nd period						
No	Country	Total	Decomposition			Total	Decomposition		Net change of headcount poverty between two periods
			Chronic poverty	Upward mobility	Downward mobility		Chronic poverty	Downward mobility	
Panel A: Unconditional poverty mobility									
1	Palestine	1.4	0.1	1.3	0.7	0.1	0.6	-0.7	
2	Jordan	4.3	1.0	3.3	2.4	1.0	1.4	-1.9	
3	Tunisia	9.4	1.2	8.2	4.9	1.2	3.7	-4.5	
4	Syria	40.5	7.3	33.2	8.4	7.3	1.1	-32.1	
5	Egypt	20.2	13.3	6.9	29.2	13.3	15.9	9.0	
6	Yemen	32.3	28.3	4.0	55.8	28.3	27.5	23.4	
Average		18.0	8.5	9.5	16.9	8.5	8.3	-1.1	
Panel B: Conditional poverty mobility (percent)									
1	Palestine	100	7.0	93.0	100	13.5	86.5		
2	Jordan	100	23.4	76.6	100	42.4	57.6		
3	Tunisia	100	12.8	87.2	100	24.6	75.4		
4	Syria	100	18.0	82.0	100	87.4	12.6		
5	Egypt	100	65.9	34.1	100	45.6	54.4		
6	Yemen	100	87.6	12.4	100	50.8	49.2		
Average		100	47.4	52.6	100	50.6	49.4		

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights, except that the regional average is a simple average (unweighted). 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. Panel A shows the unconditional version of poverty mobility, and Panel B shows the conditional version of poverty mobility. In both panels, columns 4 and 5 add up to column 3, and columns 7 and 8 add up to column 6. Column 9 in Panel A is obtained by subtracting column 6 from column 3.

TABLE 4
CHANGE IN THE SIZE OF THE OBJECTIVE WELLBEING CATEGORIES BY COUNTRY (PERCENTAGE), PRE-2010

(1)	(2)	(3)	(4)	(5)	(6)
No	Country	Growth in the population share of each welfare category			Annual growth in mean consumption
		Poor	Vulnerable	Middle Class	
1	Syria	-79.4	3.1	343.2	10.1
2	Tunisia	-48.0	-21.7	26.0	2.9
3	Palestine	-48.4	-17.0	6.1	1.2
4	Jordan	-44.7	1.6	2.4	-0.8
5	Egypt	44.6	-7.0	-31.1	-2.7
6	Yemen	72.6	-28.7	-52.5	-3.7
Average		-17.2	-11.6	49.0	1.2

Note: Authors' calculations are based on household survey data. All estimates are obtained using population weights, except that the regional average is a simple average (unweighted). 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 corresponds to a vulnerability index of 20 percent. Countries are ranked in a decreasing order of the cumulative annual growth rate of mean consumption (column 6).

In Table 4 countries are ranked based on the cumulative annual growth in mean consumption. An alternative ranking method is to apply the typology of pro-poor growth provided in Dang and Lanjouw (2016), which prioritizes the low-income group and the middle-income group (in that order) before the top-income group. Appendix 2 provides a detailed discussion of this method and its ranking, which produces similar results.²⁹

The results in Table 4 focus on the increase or decrease of the population size of each welfare group, but do not consider between-group movements. We probe more deeply into such transitions and show the results in Figure 5. It displays the share in total population of the upwardly mobile (i.e. those who moved from the low-income to the middle and top-income groups, or from the middle-income to the top-income group), the immobile (i.e. those whose incomes remained in the same income categories), and the downwardly mobile (i.e. those who moved down one or two income categories). Downward mobility (maroon bars) and upward mobility (orange bars) are lower and higher respectively for most countries. These estimation results provide a richer, but rather consistent analysis with our earlier discussion. They identify Syria, Tunisia and the Palestine territories as economies with stronger upward than downward mobility and Yemen and Egypt as countries with stronger downward than upward mobility, and Jordan as a country with relatively balanced upward and downward mobility. For the region as a whole, our analysis suggests that in developing MENA the share of the middle class grew by more than 15 percent in this period (from 36 percent (Table 2) to 42 percent (Table 1.5, Appendix 1)).

²⁹Another option, still, is to consider growth in the mean consumption for the different welfare groups instead of the changes in the population share. See Dang and Ianchovichina (2016) for estimation results using this approach.

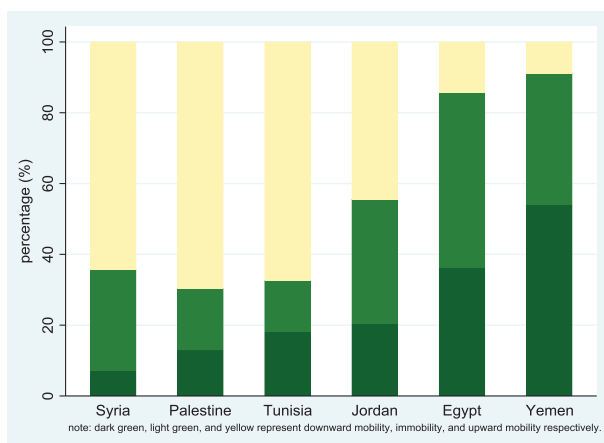


Figure 5. Welfare dynamics using monetary measures by country, pre-2010. [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 5

CHANGE IN THE SIZE OF THE SUBJECTIVE WELLBEING CATEGORIES BY COUNTRY, 2009-2012 (PERCENTAGE)

(1) No	(2) Country	(3) (4) (5) Growth in the population share of each welfare category			(6) Annual growth in mean satisfaction
		Unhappy	Struggling	Happy	
1	Morocco	-26.7	20.1	37.0	1.3
2	Algeria	12.0	-11.4	34.7	-0.1
3	Iraq	6.0	-9.5	43.3	-0.3
4	Lebanon	39.5	-8.6	-43.8	-4.4
5	Tunisia	74.3	-22.4	-30.9	-5.2
6	Jordan	91.7	-8.6	-46.3	-5.5
7	Yemen	22.3	-6.4	-49.3	-6.0
8	Egypt	71.1	-28.1	-38.5	-6.4
9	Syria	100.3	-66.3	-38.1	-14.4
Average		43.4	-15.7	-14.7	-4.6

Note: Authors' calculation are based on Gallup World Poll survey data. All estimates are obtained using population weights, except that the regional average is a simple average (unweighted). Respondents' age is between 15 and 55 in the first survey round and adjusted accordingly for the second survey round. The satisfaction groups are defined as Unhappy (4 and below), Struggling (between 5 and 7), and Happy (8 or higher). Countries are ranked in a decreasing order of the cumulative annual growth rate of mean satisfaction (column 6).

4.2. Welfare Dynamics with Subjective Well-being Measures

We now turn to analyzing subjective well-being dynamics. The growth patterns for the different satisfaction categories, shown in Table 5, indicate that during the period between 2009 and 2012 on average more people joined the ranks of the unhappy (dissatisfied) and exited the ranks of the struggling and the satisfied (categories) (Table 5).³⁰ This deteriorating trend was stronger in the

³⁰Another ranking of the transitions based on the pro-unhappy typology in Dang and Lanjouw (2016) also indicates that the four Arab Spring countries rank lowest (Table 2.3, Appendix 2).

TABLE 6
SUBJECTIVE WELLBEING TRANSITION DYNAMICS WITH SYNTHETIC PANELS, 2009-2012 (PERCENTAGE)

		2012			
		Unhappy	Struggling	Happy	Total
Panel A: Arab Spring countries					
2009	Unhappy	17.8 (0.1)	10.0 (0.0)	1.5 (0.0)	29.3 (0.1)
	Struggling	23.8 (0.0)	24.3 (0.0)	6.1 (0.0)	54.2 (0.0)
	Happy	4.7 (0.0)	8.3 (0.0)	3.6 (0.0)	16.5 (0.0)
	Total	46.3 (0.1)	42.5 (0.1)	11.2 (0.0)	100
Panel B: Other regional countries					
2009	Unhappy	11.7 (0.0)	5.8 (0.0)	0.3 (0.0)	17.8 (0.1)
	Struggling	13.3 (0.0)	31.7 (0.0)	8.8 (0.0)	53.7 (0.0)
	Happy	1.1 (0.0)	11.9 (0.0)	15.5 (0.1)	28.4 (0.1)
	Total	26.0 (0.1)	49.4 (0.0)	24.5 (0.1)	100

Note: Authors' calculation are based on Gallup World 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 groups are defined as Unhappy (4 and below), Struggling (between 5 and 7), and Happy (8 or higher). 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).

Arab Spring countries than elsewhere in the Arab world (Table 5). While the category of dissatisfied people in other Arab countries in the region increased by 46 percent (i.e., = $(26/17.8)-1$), in the Arab Spring countries it increased by 58 percent (Table 6). At the same time, the decrease in the size of the categories of struggling and satisfied people in Arab Spring countries was more than twice the decline of these categories in other Arab countries. In terms of absolute numbers, the category of dissatisfied people in the Arab Spring countries expanded by 17 percentage points and increased from less than one third of the population in 2009 to almost half (46 percent) of the population in 2012. In other Arab countries, this group expanded by just 8 percentage points and increased from less than one fifth (18 percent) of the population in 2009 to slightly more than one fourth (26 percent) of the population in 2012.³¹

Another useful way to gauge the subjective welfare dynamics is to look at the percentage of the population that changed their welfare status during this period. In the Arab Spring countries, 21 percent of the population moved up one or two

³¹Estimation results using somewhat different thresholds for the dissatisfied and struggling groups (i.e. defining the individuals who are dissatisfied and struggling as those with satisfaction score of 5 and below and between 6 and 7, respectively) and an alternative specification using the 40th and 80th percentiles to define the groups of dissatisfied and struggling offer qualitatively similar results. These results are provided in Appendix 1, Tables 1.7 and 1.8 and in Dang and Ianchovichina (2016).

TABLE 7
TRANSITION DYNAMICS FOR EXPECTED VS. EXPERIENCED SUBJECTIVE WELLBEING, MENA 2009-2012
(PERCENTAGE)

		2012 (Experienced)			
		Unhappy	Struggling	Happy	Total
Panel A: Arab Spring countries					
2009 (Expected)	Unhappy	10.7 (0.0)	4.2 (0.0)	0.4 (0.0)	15.3 (0.1)
	Struggling	23.1 (0.0)	18.3 (0.0)	3.3 (0.0)	44.7 (0.0)
	Happy	12.5 (0.0)	20.0 (0.0)	7.4 (0.0)	40.0 (0.1)
	Total	46.3 (0.1)	42.5 (0.1)	11.2 (0.0)	100
Panel B: Other regional countries					
2009 (Expected)	Unhappy	5.5 (0.0)	1.7 (0.0)	0.1 (0.0)	7.3 (0.0)
	Struggling	15.8 (0.0)	21.8 (0.0)	3.7 (0.0)	41.2 (0.0)
	Happy	4.7 (0.0)	25.9 (0.0)	20.8 (0.1)	51.5 (0.1)
	Total	26.0 (0.1)	49.4 (0.0)	24.5 (0.1)	100

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 groups are defined as Unhappy (4 and below), Struggling (between 5 and 7), and Happy (8 or higher). 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).

subjective welfare categories (i.e. = $(10+1.5+6.1)/(29.3+54.2)$). However, the percentage of people who moved down one or two welfare categories in the Arab Spring group is 52 percent, much higher than the corresponding figure of 32 percent in the rest of the Arab countries. The region-wide trend is qualitatively similar, with 18 percent of the population moving up one or two subjective welfare categories and 37 percent moving down one or two subjective welfare categories during the period 2009-12 (see Table 1.6, Appendix 1).

One notable feature of the Gallup World Poll is that data are also collected on individuals' expected life satisfaction or subjective wellbeing five years later in the future. We therefore examine whether *expected* satisfaction in 2009 for five years later exhibits a similar pattern as with experienced satisfaction in 2012, that is, whether expected subjective wellbeing declines faster for Arab Spring countries than other Arab countries. Estimation results, provided in Table 7, confirm our hypothesis. While between 5 and 10 percent of the population moved up one or two subjective welfare categories in both Arab Spring countries and other countries, more than half of the population moved down one or two welfare categories in the former group, which is 11 percent higher than the corresponding figure in the latter group.

As in Figure 5 showing the dynamics for monetary measures, Figure 6 displays by country the (upwardly) downwardly mobile (i.e. those who move (up) down one

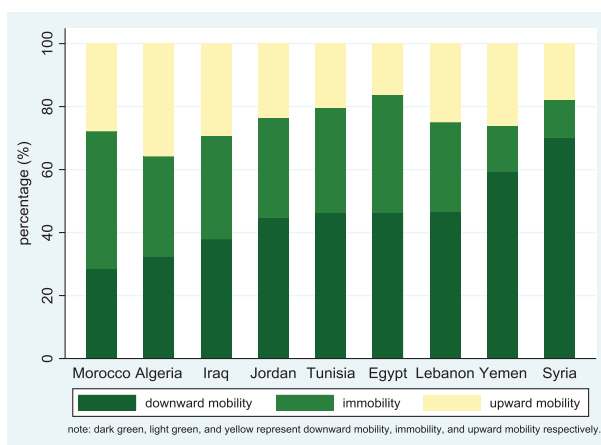


Figure 6. Subjective well-being dynamics by country, 2009-2012 (percentage) [Colour figure can be viewed at wileyonlinelibrary.com].

or two welfare categories), and the immobile (i.e. those who remain in the same income category). The figure illustrates that in the context of subjective wellbeing, there was less upward mobility and more downward mobility in the Arab Spring countries—Syria, Yemen, Egypt, and Tunisia—compared to other Arab countries.

4.3. Welfare Dynamics for Population Groups

What are the welfare dynamics patterns at a more disaggregated level? We plot in Figure 7 the percentage of the poor or vulnerable in the first year who move up one or two welfare categories in the second year for major population groups classified by gender, education levels (i.e., less than primary (or no) education, primary education, secondary education, post-secondary education, and college), occupation (i.e., paid employee, employer, self-employed, and others—informal work—including unpaid family workers and other categories), and residence areas (i.e., rural or urban).³²

A couple of remarks are in order for Figure 7. First, having no education, being employed as informal worker, and living in rural residence are all characteristics that are positively associated with lower-than-average chances for upward mobility during the pre-Arab Spring period (i.e., the orange dots represent the transition percentages for different population groups and the dashed line represents the national average in panel A). These are also the same characteristics that are associated with having higher-than-average chances of downward mobility (panel B); while the opposite holds for the remaining characteristics.³³ Second, the

³²We show the conditional, rather than the joint, probabilities in Figures 7, 8, and 9 since this helps us bring out more clearly the transition patterns for the different population groups. For example, a small percentage of the population with secondary or higher education are usually found in poverty or vulnerability in the first period to start with, consequently their transitions to higher income categories are smaller. An additional assumption required for producing these graphs is that the mobility for each population group should generally follow that for the whole population.

³³Factors that are positively correlated with upward mobility are in general related to those associated with escaping downward mobility, but this may not always hold. See, e.g. Dang and Lanjouw (forthcoming) for an analysis of mobility in India.

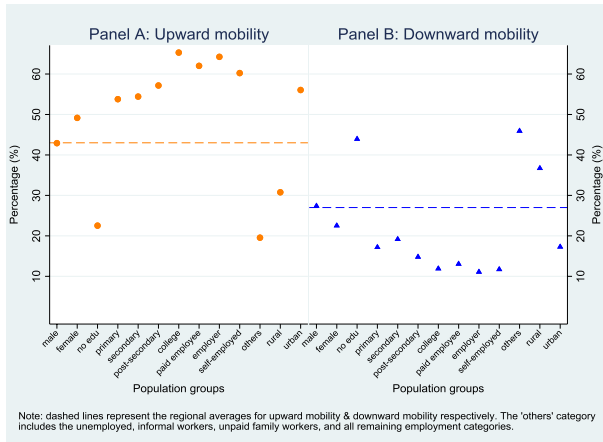


Figure 7. Region-wide welfare dynamics using monetary measures by population group, pre-2010. [Colour figure can be viewed at wileyonlinelibrary.com]

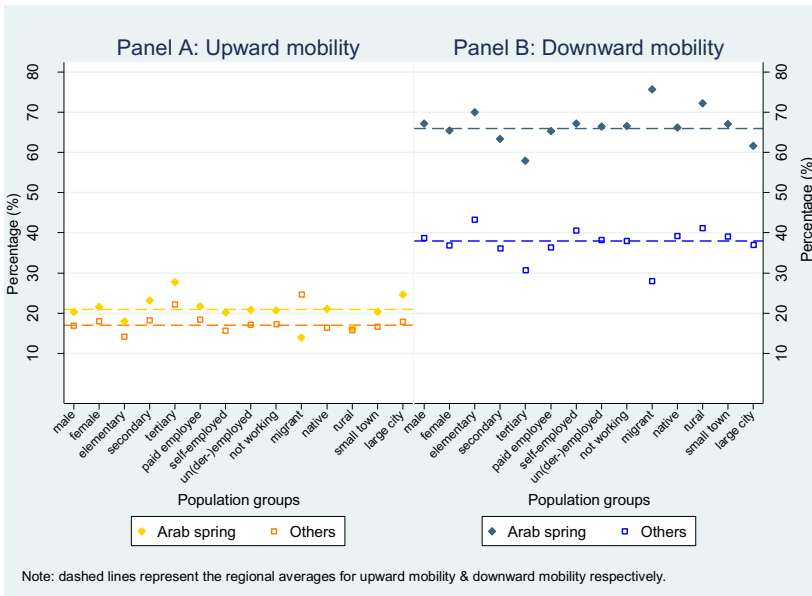


Figure 8. Subjective well-being dynamics in Arab Spring countries and other Arab countries by population group, 2007-2012. [Colour figure can be viewed at wileyonlinelibrary.com]

overall pattern of mobility is consistent with the findings we have at the country level, where upward mobility is generally higher than downward mobility.

The variables in the Gallup World Poll surveys are defined somewhat differently from those in the harmonized household survey data and we add another variable indicating whether an individual is a migrant (from another country) or a native resident. Figure 8 then plots the same type of graphs for the subjective wellbeing dynamics of Arab Spring and all other Arab countries. The results differ

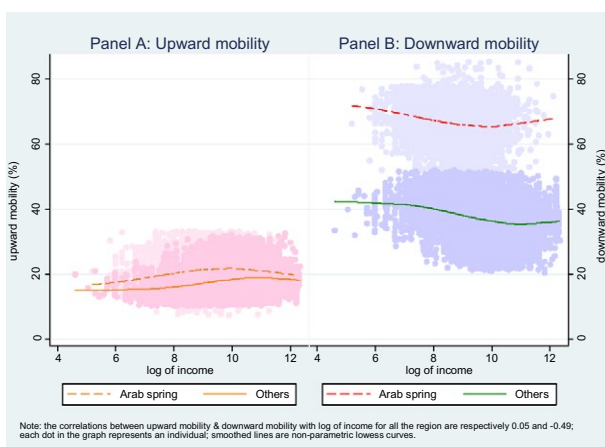


Figure 9. Subjective well-being dynamics vs. income for Arab Spring countries and other Arab countries, 2007-2012. [Colour figure can be viewed at wileyonlinelibrary.com]

from those for the monetary measures in Figure 7 as upward mobility is weaker than downward mobility both for Arab Spring and other Arab countries. There is more variation by population group in the case of downward mobility than upward mobility. For example, moving from primary education to secondary education is associated with roughly a 5 percentage point increase in upward mobility but a 7 percentage point decrease in downward mobility for both the Arab Spring countries and the other countries. Figure 8 also shows that while migrants are more likely to be less upwardly mobile (and more downwardly mobile) in Arab Spring countries, the opposite holds for non-Arab-Spring countries.

Non-parametric curves of the subjective wellbeing dynamics against individual income (in logarithmic form from the Gallup World Poll surveys), presented in Figure 9, indicate that upward mobility increases but very slightly along the income distribution and plateaus towards the high end of the income distribution in all Arab countries. By contrast, downward mobility shows a decreasing trend toward higher income levels, but in the Arab Spring countries it slightly curves upward at the top income levels, suggesting that the most affluent individuals experienced erosion in happiness levels to an extent similar in magnitude to those of the lower income groups.³⁴

³⁴ Formal t-tests, however, indicate that the differences between the affluent and the poor are statistically significant. We also examined some alternative measures of both objective and subjective well-being that are available in the Gallup Poll data. We found that insufficient food consumption in the past year was associated with increased downward mobility with subjective well-being data, while inadequate housing was associated with a negligible decrease. The correlation between variables such as belief about government corruption or satisfaction with the environment and overall satisfaction dynamics was negligible. However, belief in the local job market, satisfaction with the local education, public transportation, and healthcare system were associated with reduced downward mobility by around 6 to 8 percent.

5. CONCLUDING REMARKS AND POLICY IMPLICATIONS

We provide systematic analysis of welfare dynamics using both objective and subjective measures of well-being and evidence on the eroding middle-class consensus in Arab countries before and after the Arab Spring. In the absence of panel data, we employ state-of-the-art synthetic panel techniques using repeated cross-sections of expenditure data from household surveys and subjective wellbeing data from value surveys, conducted during the 2000s and early 2010s.

We find mixed trends in welfare dynamics with the monetary data. About half of the poor in the 2000s moved out of poverty by the end of the decade but chronic poverty remained high; upward mobility was strong in Syria and Tunisia, but downward mobility was pronounced in Yemen and Egypt. The subjective welfare dynamics suggest negative developments in most countries during the Arab Spring transitions, and the share of dissatisfied people increased while those of the happier groups declined in almost all countries. This trend was particularly pronounced in the Arab Spring countries. The analysis with subjective wellbeing data reflects increased dissatisfaction with symptoms of a broken social contract, including the decline in the quality of public services and poor labor market conditions. We also find that certain characteristics such as low education achievement, informal work, and rural residence are negatively associated with upward mobility and positively associated with downward mobility according to both objective and subjective welfare measures.

Several lessons emerge from this work. First, analysis of welfare dynamics using household surveys' expenditure data does not always align with that based on subjective wellbeing data. The results are qualitatively different for Syria and Tunisia where downward mobility is stronger than upward mobility, according to subjective wellbeing data, but the reverse occurs according to monetary welfare indicators. Notably, the advantage of the subjective wellbeing measures is that they capture factors not reflected in expenditure measures of welfare such as quality of life considerations, expectations, and changes not yet reflected or not measured well with objective data. In the MENA regional context, increases in welfare status based on expenditure increases may reflect to some extent increased private spending that occurred due to reduced public spending.

In sum, the use of alternative welfare measures has been essential for gaining insights about developments not reflected adequately in monetary indicators. Other studies also suggest that objective and subjective welfare measures may not always overlap (OECD (2015)) and emphasize the importance of indicators related to subjective wellbeing for improving economists' ability to track human development progress (Ravallion, 2012). Seen in this light, it can be useful to combine analysis based on both types of wellbeing for a more comprehensive picture of welfare dynamics. Thus, our study can provide a potentially useful framework of analysis for future work in different country contexts, including in terms of defining the middle class. Second, this paper shows that chronic poverty remained high, accounting for around 50 percent of total poverty in the region.

Finally, the association of certain characteristics—such as having low education achievement, working as informal worker, and living in rural areas—with lower-than-average chances of upward mobility and higher-than-average chances of downward mobility for objective welfare have clear policy implications. Indeed, development policies that can improve welfare along certain dimensions may have compound beneficial impacts not just on objective wellbeing but also on subjective wellbeing, at least in the short term. For example, further improvement of individual characteristics such as education may provide protection against downward mobility, while improvements in the business environment may create conditions for more and better quality jobs. Thus, improving certain development outcomes such as education achievement can help improve both short-term and longer-term welfare.

Some caveats are important to mention. Although the Gallup World Poll offers the most complete survey data on subjective wellbeing, the fact that these data were not available in most cases for the period before 2009 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. Furthermore, 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 but overlapping time periods.

REFERENCES

- Abu-Ismaïl, K. and N. Sarangi, “A New Approach to Measuring the Middle Class: Egypt”, ESCWA Working Paper, United Nations, New York, 2013.
- Alesina, A. and R. Perotti, “Income Distribution, Political Instability, and Investment”, *European Economic Review*, 40, 1203–128, 1996.
- Ali, A.G.A., “Middle Class in the Arab Countries”, *Development Bridge # 103*, API, Kuwait.
- Alkire, S., J. Foster, S. Seth, M.E. Santos, J.M. Roche and P. Ballon, “Multidimensional Poverty Measurement and Analysis”, *OPHI working paper N° 82*, 2014.
- Amin, M., R. Assaad, N. Al-Baharna, K. Dervis, R.M. Desai, N.S. Dhillon, C. Graham, K. Sierra, R.M. Desai, D. Kaufmann and T.M. Yousef, *After the Spring: Economic Transitions in the Arab World*, Oxford University Press, New York, 2012.
- Arampatzi, E., M. Burger, E. Ianchovichina, T. Rohricht and R. Veenhoven, “Unhappy Development: Dissatisfaction with Life on the Eve of the Arab Spring”, *Review of Income and Wealth*, forthcoming.
- Banerjee, A. and E. Duflo, “The Economic Lives of the Poor”, *Journal of Economic Perspectives*, 21, 141–67, 2007.
- , “What Is Middle Class about the Middle Classes around the World?” *Journal of Economic Perspectives*, 22, 3–28, 2008.
- Barrett, C.B., “Rural Poverty Dynamics: Development Policy Implications”, *Agricultural Economics*, 32, 45–60, 2005.
- Bierbaum, M. and F. Gassmann, “Chronic and Transitory Poverty in the Kyrgyz Republic: What Can Synthetic Panels Tell Us?” *UNU-MERIT Working Paper #2012-064*, 2012.
- Birdsall, N., “Reflections on the Macroeconomic Foundations of Inclusive Middle-class Growth”, *Center for Global Development Working Paper # 130*, Washington DC, 2007.
- Brix, H., E. Lust and M. Woolcock, *Trust, Voice, and Incentives: Learning from Local Success Stories in Services Delivery in the Middle East and North Africa*, World Bank, Washington DC, 2015.
- Cancho, C.A., M.E. Dávalos, G. Demarchi, M. Meyer and C.S. Páramo, “Economic Mobility in Europe and Central Asia: Exploring Patterns and Uncovering Puzzles”, *World Bank Policy Research Paper No. 7173*, World Bank, Washington DC, 2015.

- Cantril, H., *Pattern of Human Concerns*, Rutgers University, New Brunswick, 1965.
- Chaudhuri, S. and M. Ravallion, “How Well Do Static Indicators Identify the Chronically Poor?” *Journal of Public Economics*, 53, 367–94, 1994.
- Chun, N., “Middle Class Size in the Past, Present, and Future: A Description of Trends in Asia”, *Asian Development Bank Economics Working Paper Series No. 217*, Asia Development Bank, Manila, 2010.
- Cruces, G., P. Lanjouw, L. Lucchetti, E. Perova, R. Vakis and M. Viollaz, “Estimating Poverty Transitions Repeated Cross-Sections: A Three-country Validation Exercise”, *Journal of Economic Inequality*, 13, 161–79, 2015.
- Dang, H.-A. and P.F. Lanjouw, “Dynamics Measurement: Two Definitions of a Vulnerability Line”, *Review of Income and Wealth*, 63, 633–60, 2017.
- , “Toward a New Definition of Shared Prosperity: A Dynamic Perspective from Three Countries,” in K. Basu and J. Stiglitz (eds.), *Inequality and Growth: Patterns and Policy*, Palgrave MacMillan Press, London, 151–171, 2016.
- , “Measuring Poverty Dynamics with Synthetic Panels Based on Cross-Sections”, *World Bank Policy Research Working Paper # 6504*, World Bank, Washington DC, 2013.
- Dang, H.-A., P. Lanjouw, J. Luoto and D. McKenzie, “Using Repeated Cross-Sections to Explore Movements in and out of Poverty”, *Journal of Development Economics*, 107, 112–28, 2014.
- Dang, H.-A., P. Lanjouw and U. Serajuddin, “Updating Poverty Estimates at Frequent Intervals in the Absence of Consumption Data: Methods and Illustration with Reference to a Middle-Income Country”, *Oxford Economic Papers*, 69, 939–62, 2017.
- Dang, H.-A. and A.L. Dabalen, “Is Poverty in Africa Mostly Chronic or Transient? Evidence from Synthetic Panel Data”, *Journal of Development Studies*, in press.
- Dang, H.-A. and E. Ianchovichina, “Welfare Dynamics with Synthetic Panels: The Case of the Arab World in Transition”, *World Bank Policy Research Working Paper # 7595*, World Bank, Washington DC, 2016.
- Dang, H.-A. and P. Lanjouw, “Poverty Dynamics in India between 2004–2012: Insights from Longitudinal Analysis Using Synthetic Panel Data”, *Economic Development and Cultural Change*, forthcoming.
- Devarajan, S. and E. Ianchovichina, “A Broken Social Contract, Not High Inequality, Led to the Arab Spring”, *Review of Income and Wealth*, forthcoming.
- Dolan, P., T. Peasgood and M. White, “Do We Really Know What Makes Us Happy? A Review of the Economic Literature on the Factors Associated with Subjective Well-Being”, *Journal of Economic Psychology*, 29, 94–122, 2008.
- Drèze, J. and A. Sen, *Uncertain Glory: India and its Contradictions*, Princeton University Press, 2013.
- Easterlin, R.A., L.A. McVey, M. Switek, O. Sawangfa and J.S. Zweig, “The Happiness-Income Paradox Revisited”, *Proceedings of the National Academy of Sciences of the United States of America*, 107, 22463–68, 2010.
- Easterly, W., “The Middle Class Consensus and Economic Development”, *Journal of Economic Growth*, 6, 317–35, 2001.
- Elbers, C., J.O. Lanjouw and P. Lanjouw, “Micro-level Estimation of Poverty and Inequality”, *Econometrica*, 71, 355–64, 2003.
- El-Laithy, H. and K. Abu-Ismaïl, *Poverty in Syria: 1996-2004: Diagnosis and Pro-Poor Policy Considerations*, UNDP, mimeo, 2005.
- Ferreira, F.H.G., J. Messina, J. Rigolini, L.-F. López-Calva and R. Vakis, *Economic Mobility and the Rise of the Latin American Middle Class*, World Bank, Washington DC, 2013.
- Friedman, J. and D. Thomas, “Psychological Health, Before, During and After an Economic Crisis: Results from Indonesia 1993–2000”, *World Bank Economic Review*, 23, 57–76, 2009.
- Gallup World Poll, World, *Gallup World Poll*, Gallup Inc., 2013.
- Garbero, A., “Estimating Poverty Dynamics Using Synthetic Panels for IFAD-supported Projects: A Case Study from Vietnam”, *Journal of Development Effectiveness*, 6, 490–510, 2014.
- Graham, C., *Happiness around the World: The Paradox of Happy Peasants and Miserable Millionaires*, Oxford University Press, New York, 2010.
- Graham, C. and E. Lora, “Happiness and Health Satisfaction across Countries”, in C. Graham and E. Lora (eds.), *Paradox and Perception: Measuring Quality of Life in Latin America*, Brookings Institution Press, Washington DC, 2009.
- Graham, C. and S. Pettinato, “Frustrated Achievers: Winners, Losers and Subjective Well-Being in New Market Economies”, *Journal of Development Studies*, 38, 100–40, 2002.
- Hassine, N., “Income Inequality in the Arab Region”, *World Development*, 66, 532–56, 2015.
- Ianchovichina, E., “Economic Costs of Post-Arab Spring Civil Wars in the Middle East and North Africa. *Panorama, Economy and Territory, IEMed Mediterranean Yearbook*, 2016.

- Jenkins, S.P., *Changing Fortunes: Income Mobility and Poverty Dynamics in Britain*, Oxford University Press, Oxford, 2011.
- Khor, N. and J. Pencavel, "Income Mobility of Individuals in China and the United States", *Economics of Transition*, 14, 417–58, 2006.
- Kopczuk, W., E. Saez and J. Song, "Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937", *Quarterly Journal of Economics*, 125, 91–128, 2010.
- Martinez Jr, A., M. Western, M. Haynes and W. Tomaszewski, "Measuring Income Mobility Using Pseudo-Panel Data", *Philippine Statistician*, 62, 71–99, 2013.
- OECD, *How's Life? 2015: Measuring Well-being*, OECD Publishing, Paris, 2015.
- Rama, M., T. Bêteille, Y. Li, P.K. Mitra and J.L. Newman, *Addressing Inequality in South Asia*, World Bank, Washington DC, 2015.
- Ravallion, M., "The Developing World's Bulging (but Vulnerable) Middle Class", *World Development*, 38, 445–54, 2010.
- , "Poor or Just Feeling Poor? On Using Subjective Data in Measuring Poverty", *World Bank Policy Research Paper # 5968*. World Bank, Washington DC, 2012.
- , *The Economics of Poverty: History, Measurement, and Policy*, Oxford University Press, New York, 2016.
- Rojas, M., "Experienced Poverty and Income Poverty in Mexico: A Subjective Well-Being Approach", *World Development*, 36, 1078–93, 2008.
- Stevenson, B. and J. Wolfers, "Economic Growth and Subjective Well-Being: Reassessing the Easterlin Paradox", *Brookings Papers on Economic Activity*, 35, 1–87, 2008.
- Veenhoven, R., "Why Social Policy Needs Subjective Indicators", *Social Indicators Research*, 110, 433–451, 2002.
- Verme, P., "Facts and Perceptions of Inequality", in P. Verme, B. Milanovic, S. Al-Shawarby, S. ElTawila, M. Gadallah and A. El-Majeed (eds), *Inside Inequality in the Arab Republic of Egypt: Facts and Perceptions across People, Time, and Space*, 2014.
- Vishwanath, T., A. Atamanov and N. Krishnan, *Reducing Poverty and Boosting Shared Prosperity: Where does the Middle East and North Africa stand?* MENA Poverty Brief, World Bank, Washington DC, 2015.
- World Bank, *Fairness and Accountability: Engaging in Health Systems in the Middle East and North Africa*, World Bank, Washington DC, 2013.

Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Appendix 1: Additional Tables and Figures

Table 1.1: Household Consumption Models and Chronic Poverty Estimates, Pre-2010

Table 1.2: Satisfaction Regression Models for Some Sample Countries, MENA 2009-2012

Table 1.3: Vulnerability Lines at Given Vulnerability Indexes for Objective Wellbeing, Pre-2010

Table 1.4: Vulnerability Lines at Given Vulnerability Indexes for Subjective Wellbeing

Table 1.5: Population Share of Each Welfare Category in the Second Period (percentage)

Table 1.6: Region-wide Wellbeing Transition Dynamics with Synthetic Panels, 2009- 2012 (percentage)

Table 1.7: Subjective Wellbeing Transition Dynamics with Synthetic Panels, with Somewhat Different “Dissatisfaction” and Vulnerability Lines, 2009- 2012 (percentage)

Table 1.8: Subjective Wellbeing Transition Dynamics, with Alternative Specifications for the “Dissatisfaction” and Vulnerability Lines, MENA 2009- 2012 (percentage)

Figure 1.1: Dissatisfaction Rate by Country, 2009-2012

Appendix 2: An Alternative Method of Ranking the Transition Dynamics

Table 2.1: Typology of Welfare Transition Dynamics over Two Periods

Table 2.2: Change in Shared Prosperity for Each Country (percentage)

Table 2.3: Change in Satisfaction for Each Country 2009-2012 (percentage)