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Feeling rich vs being rich:

Subjective vs objective well-being in Tanzania and Ghana

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Introduction

Improvements in well-being is arguably the key objective of economic development. Economists typically quantify well-being in terms of consumption or income. This type of well-being is 'objectively' measurable through objective well-being (OWB) measures such consumption or income information collected in household surveys. There are many reasons why one would want to examine OWB for its own sake. However, overall well-being is multidimensional and subjective. It contains OWB but also many other components that add up to an individual's welfare and utility and her subjective well-being (SWB). Utility and welfare themselves are not directly observable and rarely elicited indirectly. However, we commonly assume is that individuals derive welfare from their monetary consumption or income. Thus, higher OWB should then also lead to higher SWB. In that case OWB indicators would be good proxies for SWB and well-being.

This paper contributes to the growing economics literature on subjective well-being in developing countries and provides the first case studies on Tanzania and Ghana. First, it tests for – and finds no - correlation between a variety of SWB measures and OWB measures¹ and how these correlation change over time and across different levels of consumption. The applications for Tanzania and Ghana are the first from Africa (and perhaps any developing country). This paper uses two very different survey data sources which allow to explore new, unique aspects of SWB levels and dynamics. The data for Ghana come from a specially designed survey module on perceived well-being. This allow us to address research questions that could not be examined in the existing literature. First, the SWB data contain information not only on absolute SWB but also on relative SWB. Thus, we are able to compare absolute *and* relative SWB with absolute *and* relative OWB. The Tanzania data contains information on a range of absolute SWB indicators which allows comparisons between their levels and changes. By combining these two very different data sources, one nationally representative panel survey and one very small scale panel survey covering a specific rural population which lives in comparable social, economic and environmental circumstances which helps filter out geographic heterogeneity. The main findings in this paper also has practical relevance for policy design and for survey data collection. Since SWB are not found to be a reasonable proxy for OWB, SWB cannot be used for quick, dirty and cheap assessments of well-being and poverty. Moreover, this suggests that if one wants to monitor and target SWB as a policy indicator it is insufficient to rely on OWB as a proxy. Furthermore, when only OWB or SWB changes, or if OWB and SWB move in opposite direction as a results of for instance, policy changes, then policy makers face a trade-off between competing OWB and SWB objectives.

Second, this paper is the first application outside Russia and Germany that uses panel data to control for unobserved scale heterogeneity. Scale heterogeneity is the fundamental problem of using SWB measures. It is due to survey respondents differing in how they interpret the various steps of the economic ladder. This heterogeneity potentially presents a serious problem when using SWB measures for poverty assessments and policy purposes as it can make interpersonal comparisons of SWB difficult. An effective but time and cost intensive way to control for scale heterogeneity is to use vignettes – short stories associated with each step of the economic ladder – to anchor the scale. Vignetting has been used

¹ Consumption, and later health status and dietary diversity.

in political sciences (King, Murray, Salomon, & Tandon, 2004; King & Wand, 2007) and subsequently in select health (Bago d'Uva, Van Doorslaer, Lindeboom, & O'Donnell, 2008), labor (Kristensen & Johansson, 2008) and development economics (Beegle, Himelein, & Ravallion, 2012; Ravallion, Himelein, & Beegle, 2016). Ravallion et al (2016) show that there is indeed considerable scale heterogeneity among the poor when not using these vignettes anchors. Subjective perceptions of *levels* of well-being are greatly affected by scale heterogeneity that is not controlled for, even if intertemporal *changes* in SWB and determinants of SWB are not. Like in most surveys, the Tanzania and Ghana data collection process did not employ vignette to elicit SWB information. However, both data sources contain information of SWB over time for the same individuals. As long as individual level interpretations of SWB scales are consistent over time, this removes scale heterogeneity in *changes* of SWB over time. This paper makes use of the panel element and is the first study outside Russia and Germany to control for unobserved scale heterogeneity using SWB fixed effects at the individual-level.

Third, this paper is the first attempt to differentiate perceptions of SWB by gender. Within households, women are found to be more optimistic on SWB indicators, including 'life satisfaction', 'health', etc.; whereas men tend to overestimate subjective economic well-being relative to their female partners.

The next sections distill what we know about the relationship between SWB and OWB, and the efforts and challenges of measuring SWB. The subsequent sections introduce the data for Ghana and Tanzania, present the empirical results, and conclude.

The relationship between SWB and OWB

The evidence on the link between SWB and OWB is mixed. Cross-sectional, country-level analyses have provided strong evidence that increases in income lead to increases in well-being until 'basic needs' are met, with further increases in OWB not causing significant increases in SWB. In contrast, Stevenson & Wolfers (2013) find that the relationship between well-being and income in Gallup World Poll data is roughly log-linear and does not diminish as incomes rise. Lora and Chaparro (2009) unpack that analysis using the same data. They confirm a solid relationship between income and life satisfaction but also conclude that i) faster aggregate income growth leads to lower satisfaction, and ii) growth in incomes in one's social group lowers individual satisfaction. Moreover, for any given correlation of SWB and OWB It is also unclear whether the direction of causality of necessarily runs from higher OWB towards improved SWB, or whether higher SWB (also) causes increases in OWB (Sacks et al., 2013).

OWB indicators themselves are unlikely to be objectively accurate. Income or expenditure data is typically deflated by a price index which, in turn, is only accurate when individual consumer preferences are homothetic, so that income elasticities of demand are equal to one for all goods (Samuelson and Swamy, 1974). And even if OWB are objectively accurate, they are often not accurate reflections of actual well-being as they ignore 'entitlements' (Sen, 1981). A self-sufficient farming household with no reported (or inaccurately imputed) income could well be better off than a non-producer household with a very small recorded official income. Other individual dimensions of well-being such as nutrition, health and capabilities can also be measured objectively based on observation. And multiple OWB indicators can be combined into a composite well-being index, such as the Human Development Index, using arbitrary weights.

OWB is a subset of SWB as SWB analysis goes beyond the common objective analysis of consumption or income. SWB measures encompass more than just money-metric income or consumption, or other OWB indicators of other dimensions of well-being. Conceptually, SWB captures utility through a multidimensional welfare function. Utility for individual i is assumed to depend on quantities consumed q_i and other welfare-relevant non-income characteristics x_i so that $u = u(q_i, x_i)$ (Ravallion, 2012). Depending on the purpose and one's perspective, SWB and OWB indicators have distinct advantages and disadvantages. One view, based on traditional welfare economics and its concepts of revealed preference, willingness to pay, and moneymetric utility posits that SWB analysis does not have normative significance as it lacks any objective anchor is, thus, severely biased. The opposite, 'hedonometric' view suggests that SWB is the ultimate goal, thus, only SWB indicators should be used for assessment (Sacks et al., 2013). Thus, the perspective and purpose matters, and more so when OWB and SWB are only weakly correlated.

A potential advantage of SWB measures is that they offer are insights into overall well-being, closer to economic concept of "Utility" (Krueger & Schkade, 2008; Ravallion, 2012; Ravallion et al., 2016). Benjamin et al. (2014) propose a theory for how SWB depends on several fundamental, complementary factors including OWB, in the form of material well-being, and SWB aspects including life satisfaction and emotional experience.

SWB is robustly correlated with other, non-monetary personal OWB measures such as heart rate, electric brain activity, and sociability (Diener, 1984) and health and sleep quality (Diener, Lucas, & Scollon, 2009; Kahneman & Krueger, 2006)

Mounting empirical microeconomic evidence suggests that whether SWB and OWB are related is context specific. OWB can overestimate or underestimate SWB, both at one point in time as well as over time. Or interventions and policy changes resulted in SWB effects, but no OWB effects. Improvements in public housing options have increased SWB but not economic outcomes for families (Ludwig et al., 2013). SWB increased as a result of installing private water supplies in Morocco even though OWB fell as the private water connections are more costly (Devoto, Duflo, Dupas, Parienté, & Pons, 2012). And access to health insurance increased SWB if not OWB (Finkelstein et al., 2012)

Efforts and challenges in measuring SWB – the empirical evidence

Efforts to measure SWB have accelerated since the Sarkozy Commission recommended in 2009 to incorporate SWB indicators into official statistics. National and international institutions such as the OECD (OECD, 2013), the National Research Council of the US National Academy of Sciences (Stone & Mackie, 2013) and the UK Office of National Statistics have published extensive, positive reports on how SWB measures can contribute to policy design and evaluation.

SWB data are still relatively rare, particularly in comprehensive microeconomic surveys. But as SWB has become available there has been an increasing use of SWB for well-being measurement in development economics. Empirical work in developing countries began in the early 2000s. Pradhan and Ravallion (2000) was an early contribution using perceptions of the adequacy of food, clothing and housing consumption in Jamaica and Nepal as the basis for a subjective poverty line which could then be

compare with objective poverty line. Aggregate subjective poverty rates were similar to those based on objective poverty lines, though the geographic and demographic distribution of poverty changes significantly.

Ravallion and Lokshin (2002) use a more nuanced 9 point Likert scale to assess SWB in Russia and find that SWB does not correlate very well with OWB. Adults that subjectively felt poor often were above the poverty line and vice versa. Overall, income significantly predicts SWB but many other factors matter, including health, education, employment, assets, relative income in the area of residence and expectations about future welfare.

Kingdon and Knight (2006) propose a framework based on an individual's own perception of SWB that nests OWB within a larger, encompassing SWB concept. This framework permits to quantify the relevance and importance of all components of SWB. Defining well-being and poverty is by definition normative. Hence, they argue that using individual SWB measures is a sound basis to make the value judgment of where to put a (subjective) poverty line. Relatedly, Ravallion (2012) explores the validity of using SWB data to identify who is poor and to calibrate multidimensional welfare measures, arguing for how a 'social subjective poverty line' below which people deem themselves to be poor is a natural and appealing definition of poverty, while discussing the role of survey design, measurement errors, individual scale heterogeneity and the lack of revealed preferences across welfare alternatives.

A related set of studies examines the determinants of SWB with a particular focus on relative concepts, such as relative income compared to others. Average income of close neighbors improve SWB in South Africa, whereas that of more distant others reduces one's personal SWB. Relative income is more important to happiness at higher levels of absolute income (Kingdon & Knight, 2007). In Malawi, this was only true for richer, urban households. Poorer households' perception of well-being were primarily grounded in absolute, not relative standards of living (Ravallion & Lokshin, 2010).

In rural China SWB is not correlated with absolute personal consumption or income. Instead, even in such an absolutely poor setting, it is social comparisons and aspirations in the form of relative income within a village and relative income over time that drive SWB (Knight, Song, & Gunatilaka, 2009). Combined with economic and social insecurity relative incomes and income inequality is also the main factor that explains why poorer rural households report higher SWB than richer urban ones (Knight & Gunatilaka, 2010).

A number of unresolved issues with SWB measurement have been discussed in the current literature. First, we do not yet have a comprehensive aggregate measure of SWB that can be used to compare well-being across and within countries (Krueger & Stone, 2014). Some of this relates to how to combine various dimensions of SWB into a single scalar indicator. Benjamin et al. (2014) propose the most comprehensive – though, as they admit, still not exhaustive – variety of measures from the philosophy, psychology and economics literature, including more 'standard' SWB measures such as happiness and life satisfaction with others such as goals and achievements, freedoms, engagement, morality, self-expression, relationships and altruism. They combine these different measures using weights based on revealed choices from their survey. In the absence of revealed choice information, this paper uses

individual SWB indicators, primarily life satisfaction but also others, and examines them separately in line with the recommendations by (Krueger & Stone, 2014).

A second key challenge is how to measure SWB in a way that allows interpersonal comparisons. People differ in their personal reference points of well-being and, thus their interpretation of thresholds between steps of the SWB 'economic ladder' Likert scale (Ravallion et al., 2016), resulting in a problem of scale heterogeneity.

A small number of existing studies have tried to control for this heterogeneity by using vignettes. These contain stylized stories and scenarios of different levels of economic well-being and are presented to respondents before they are asked to evaluate their SWB. These vignettes help to anchor the SWB scale and potentially reduce discrepancies between OWB and SWB measures (Krueger & Stone, 2014; Ravallion et al., 2016; Van Soest, Delaney, Harmon, Kapteyn, & Smith, 2011). Tafere et al. (2018) similarly use vignettes to elicit scale consistent SWB measures and use these to show that existing insurance coverage causes gains in SWB that are larger than the perceived losses from an insurance policy that expires without paying out. This is further evidence that ignoring SWB effects and only measuring OWB effects can underestimate the actual impact of improving access to insurance.

The effectiveness of the vignetting approach relies on two main assumptions: first, response consistency which requires that people assess their own SWB in the same way as those in the vignettes given; and second, vignette equivalence which assumes that every respondent interprets the vignettes in the same way (King & Wand, 2007). Van Soest et al. (2011) develop a model for selecting the best anchoring. Their application to student drinking behavior in Ireland concludes that the model that controls best for response consistency and vignette correction is the most effective in aligning OWB and SWB. Though, it remains unclear whether OWB and SWB ought to be aligned in the first place. Ravallion et al. (2016) and Beegle et al. (2012) similarly show that the use of vignettes corrects for scale heterogeneity to a large degree. However, they also show that whether or not one uses vignettes for such corrections makes no significant difference for i) analyzing changes in SWB, and ii) for the determinants of SWB in their applications in Tajikistan, Guatemala and Tanzania.

The Data from Ghana and Tanzania

This paper provides evidence from two very different data sources: one nationally representative panel survey from Tanzania and one very small scale panel survey from Ghana covering a specific rural population living in comparable circumstances and economic, social and environmental settings which can help filter out geographic heterogeneity.

The rural Ghana survey contains a purposely designed SWB survey questionnaire. In 2008/09 SWB recall data was collected to match up in time with three rounds of panel data collected in 1998, 2005 and 2009. This allows the construction of a panel containing SWB and OWB indicators.

The primary SWB indicators are on economic well-being with responses on a 7 point economic ladder ranging from 'very rich' to 'destitute'. Other SWB indicators were collected on adequacy of food consumption, housing, clothing, health care, and schooling. As these latter indicators were evaluated

only on a three point scale their responses are coarser and not directly comparable to the SWB indicators collected in Tanzania (see below)

Moreover, the Ghana survey is unique in collecting relative SWB information. Households were asked to rank themselves relative to other households in the village. The seven point scale ranged from 'the richest' to 'the poorest'. This information enables comparisons of levels and changes in relative and absolute SWB vs relative and absolute OWB.

The second source of data is the National Panel Survey (NPS) from Tanzania (also known as the LSMS ISA) which, unique among nationally representative LSMS surveys, includes information on subjective well-being for adults in the household. This survey now spans four waves between 2008/09 and 2014/5. This paper draws on the second and third wave from 2010/11 and 2012/13, respectively. These two waves contain contemporaneous data for SWB and OWB measures which allows for consistent estimation of levels and changes in well-being. Using two waves of the panel also allows to control for household level fixed effects in household-level variables and individual level fixed effects to control for scale heterogeneity in SWB.

We do not use the first wave from 2008/09 as it did not collect information on SWB. While the second wave does contain recall information on SWB for 2008/09 we do not use it, so as not to avoid recall error concerns. We also do not draw on the last wave from 2014/15 which does provide SWB information but is based on a refreshed sample which starts a new nationally representative panel not linked with the panel from the first three waves. The second and third wave contain 3900 and 5015 individual-level observations of SWB as well as information on consumption and assets. Unique among national panel data surveys the Tanzania LSMS ISA also collected anthropometric indicators such as height and weight for all household members.

SWB information was collected for 8 indicators related to: health, financial situation, housing, job, available health care, education, safety and overall life satisfaction. Responses are on a 7 point Likert scale ranging from 'very dissatisfied' to 'very satisfied'. In contrast to the Ghana data, these SWB indicators are more of a reflection of the satisfaction with life. In addition, the LSMS ISA data also contains subjective assessments of overall economic well-being currently and two years ago. Both are assessed on a 7 point scale ranging from 'destitute' to 'very rich'. These latter two indicators are 'economic ladder' style questions and correspond closely to the Ghana SWB indicators.

The SWB data collection in both countries did not use anchoring vignettes. Instead, this paper control for scale heterogeneity using time invariant individual fixed effects.

Results

The main overarching results from the analysis below suggest that the correlation between SWB and OWB is extremely limited at best. In Tanzania there is a weak positive correlation between people's subjective assessment of their current economic circumstances (7 step economic ladder) and measured per adult equivalent expenditure as displayed in Figure 1.

Figure 1 Current economic circumstance (SWB#9) vs Consumption per adult equivalent (OWB)

SWB#9 vs OWB

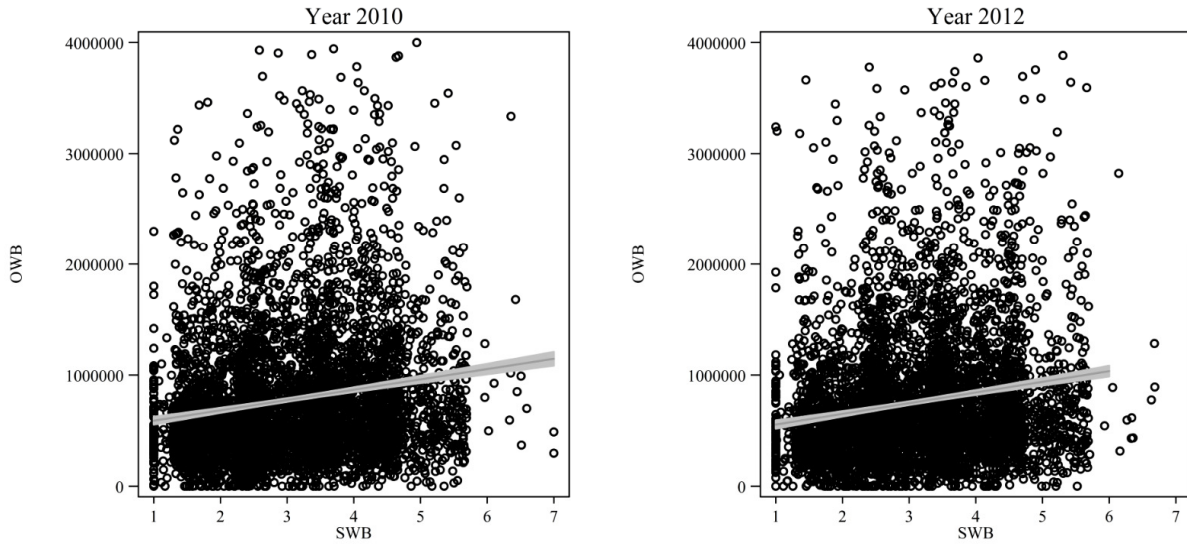
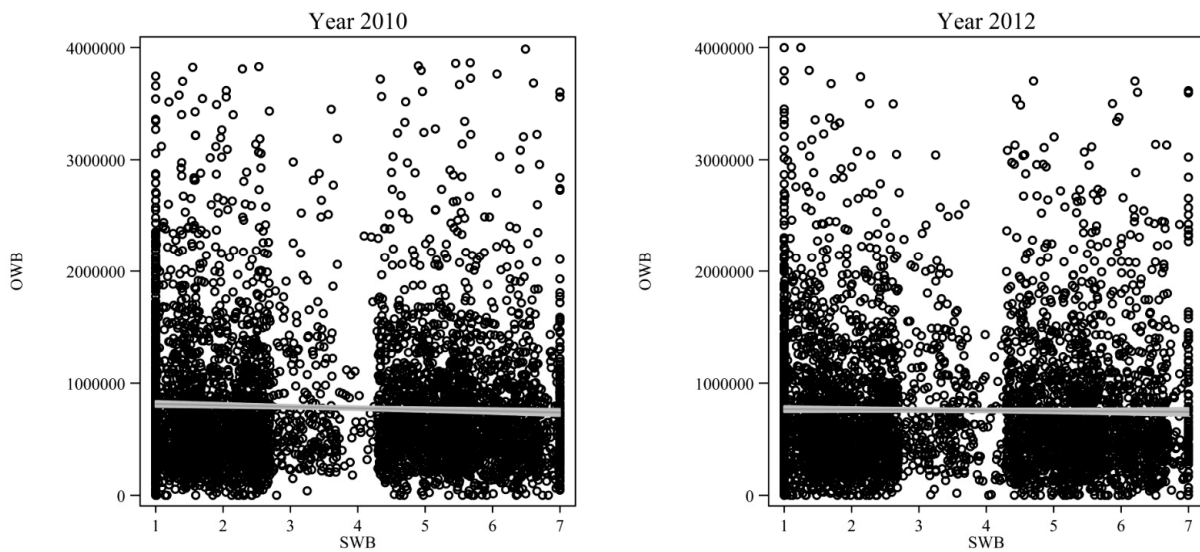


Figure 2 shows that this weak correlation between SWB and OWB disappears completely when using 'life satisfaction' as the SWB indicator.

Figure 2 Life Satisfaction (SWB#8) vs Consumption per adult equivalent (OWB)

SWB#8 vs OWB



Similarly, there is extremely weak and not statistically significant correlation between changes in life satisfaction and changes in OWB using the panel element of the data to control for scale heterogeneity (Figure 3). When using life satisfaction as the SWB measure, any hint of correlation disappears (Figure 4).

Figure 3 Changes in Current Economic Circumstances (SWB#9) vs Changes in Consumption per adult equivalent (OWB)

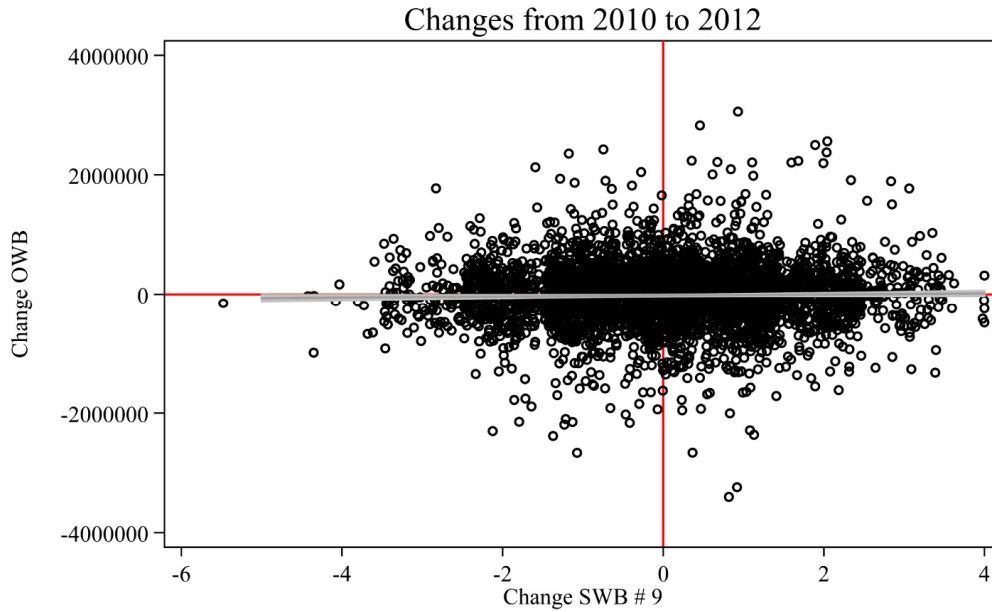
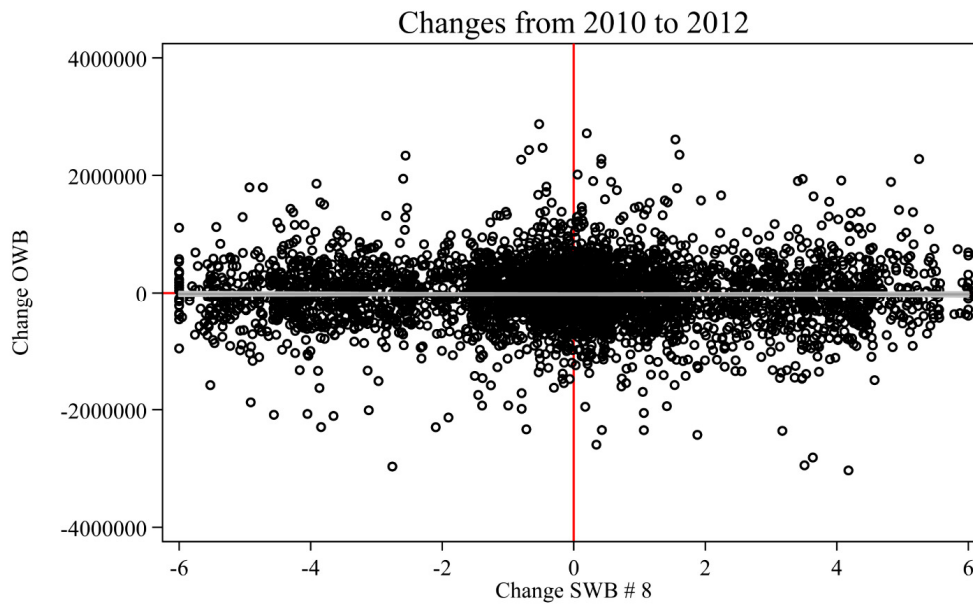
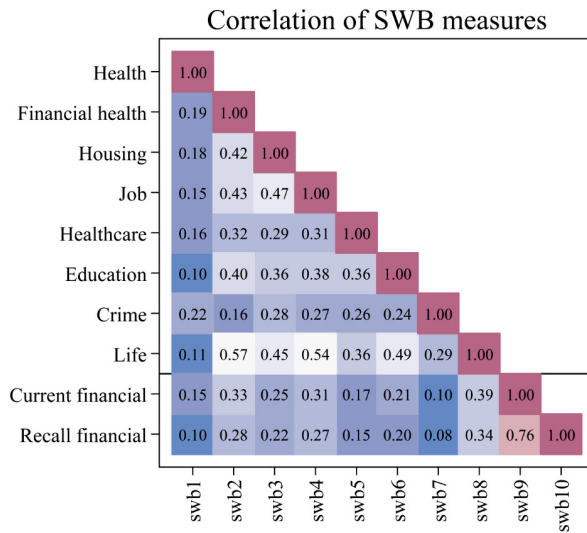


Figure 4 Changes in Life Satisfaction (SWB#8) vs Changes in Consumption per adult equivalent (OWB)



Of course, 'life satisfaction' and 'current economic circumstances' capture only parts of overall SWB. And as yet there is no credible, comprehensive index of SWB (Krueger & Stone, 2014). However, the above results are robust across all the other 8 SWB indicators available. Figure 5 shows limited correlation between the 10 SWB measures, underscoring Krueger & Stone's (2014) recommendation to measure key components of SWB separately. Nonetheless, none of the other 8 SWB indicators show significant correlation with OWB.

Figure 5 Correlation between 10 SWB measures in Tanzania



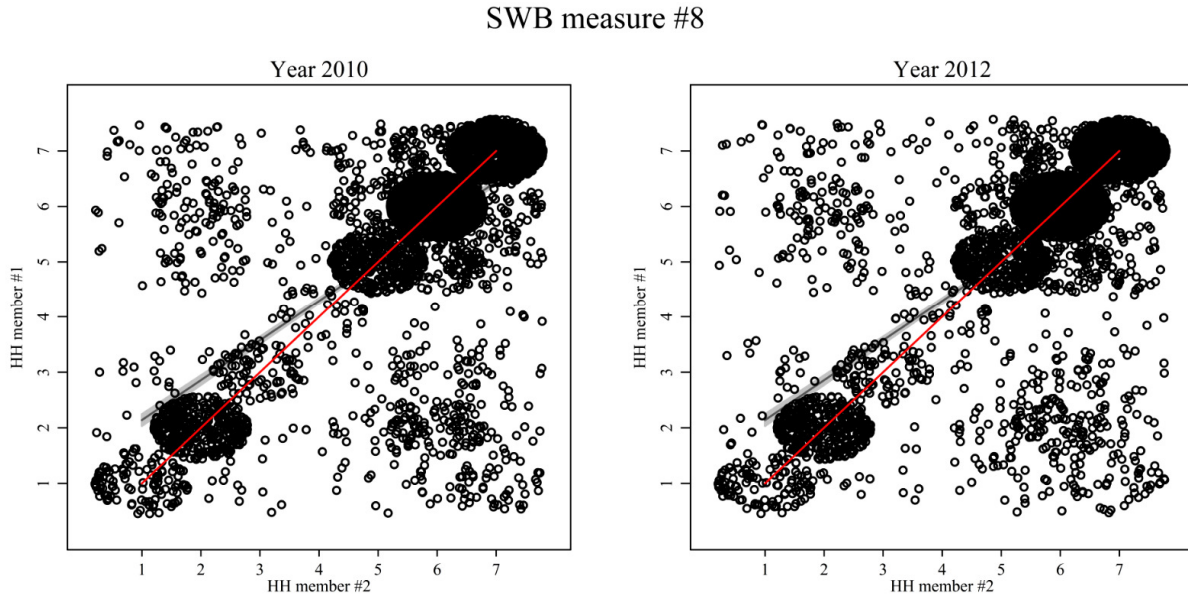
These results are in contrast to the findings of the existing studies that have controlled for time-invariant scale perceptions (Ravallion & Lokshin, 2001; Senik, 2004) both in Russia and (Winkelmann & Winkelmann, 1998) in Germany that have found significant positive correlation between SWB and OWB, particularly at lower levels of OWB. The contrasting results here could be due to the different setting of Tanzania but the differences in results are striking.

An interesting pattern emerges when examining reported SWB by gender.² Figure 6 plots one circle for each household and shows that *within* households there is a high degree of correlation between head males and females regarding a household's SWB. Perfect matching is indicated by the red 45 degree line. The grey trend line is somewhat flatter which indicates that in households at lower levels of SWB

² Household member #1 is typically the household head, and as such the oldest member of the household and 74% likely to be male. Household member #2 is typically the second oldest and 90% likely to be female.

male heads reported slightly higher SWB than their female partners. Conversely, at higher levels of SWB females report a higher level of satisfaction. This patterns holds for all 10 SWB indicators.

Figure 6 Life Satisfaction (SWB#8) – head male vs female perceptions



However, when not comparing SWB within Households, but instead looking at women’s vs men’s SWB perceptions overall women are more likely to be satisfied with SWB (indicators 1-8) than men (see Figure 7. Plots for other SWB measures are very similar). In contrast, men are more likely to report feeling richer (SWB# 9 in). Women are happier with what they have than men are. Whereas, given the same family resources, men might simply believe they have more than women!

Figure 7 Life Satisfaction (SWB#8) by Gender (male=1, female=2)

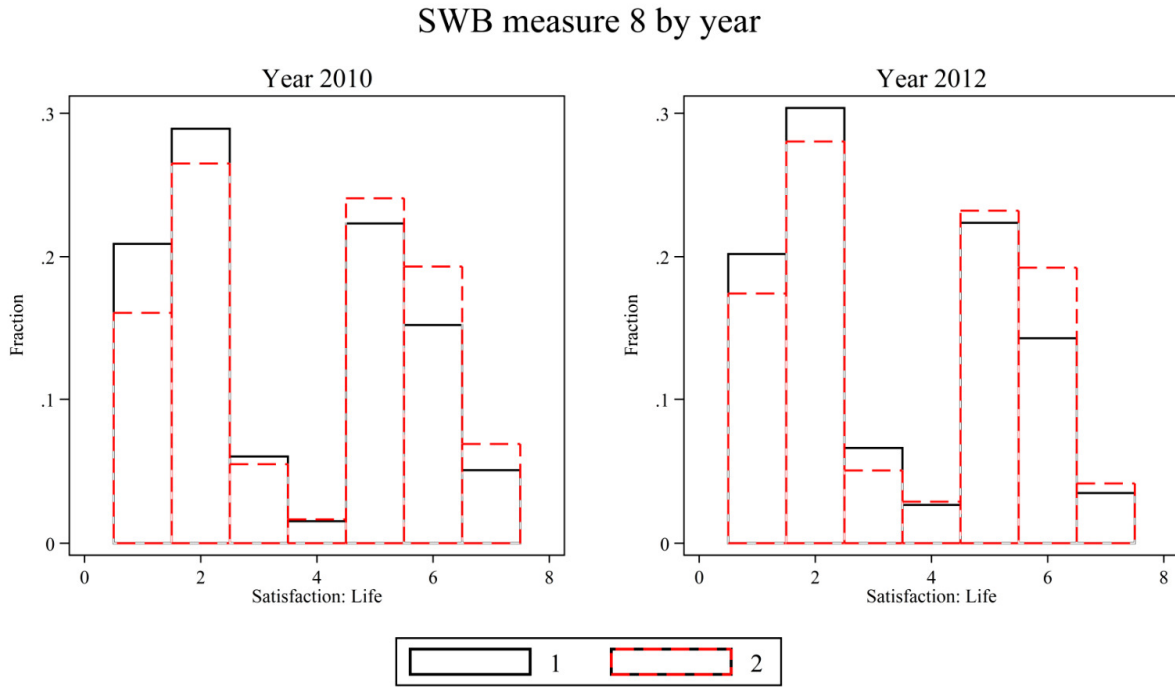
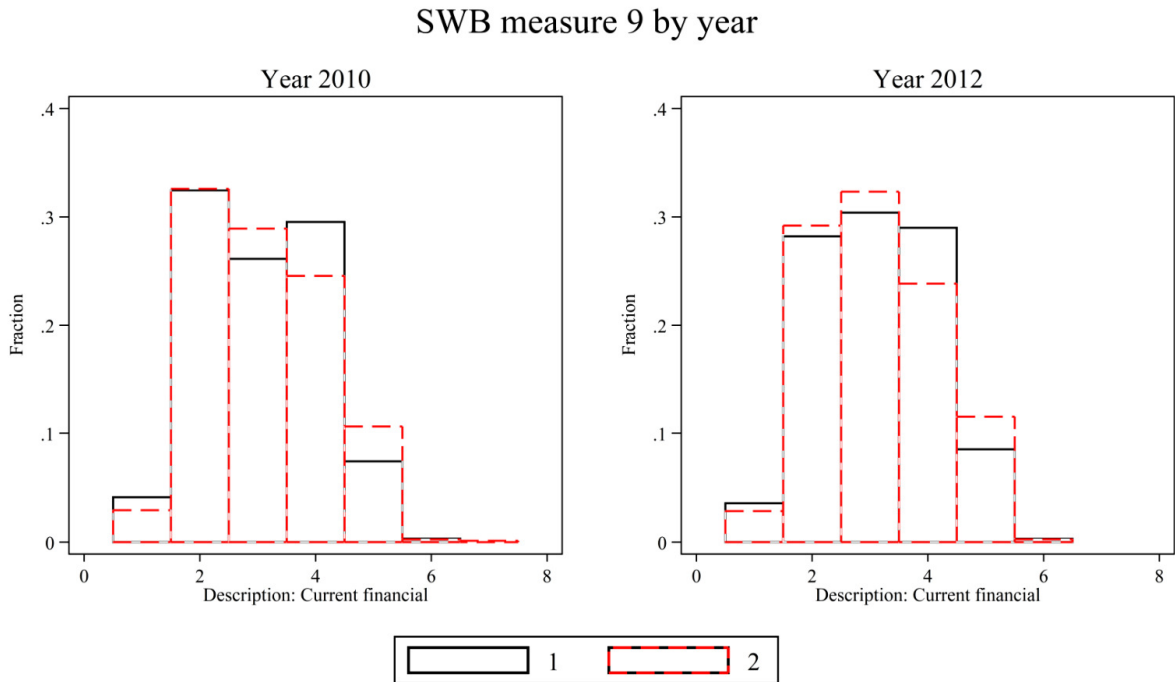
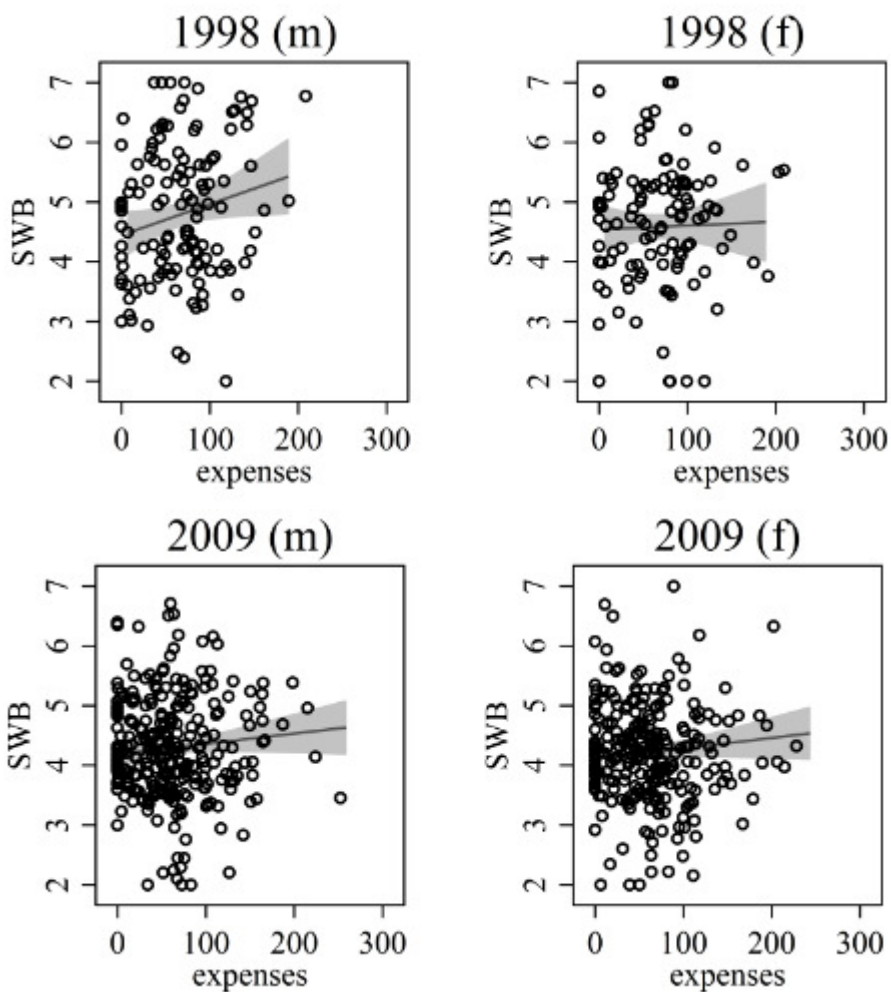


Figure 8 Current economic conditions (SWB#9) by Gender (male=1, female=2)



The results for Ghana are substantively similar to those for Tanzania above. Levels of SWB are not significantly correlated with expenditures per adult equivalent in both 1998 and 2009 for females and in 2009 for males. Only in 1998 for males is there a positive correlation (Figure 9).

Figure 9 SWB vs OWB (expenditure per adult equivalent) – levels (by gender)



Changes in SWB and OWB are uncorrelated when OWB is measured by expenditure per adult equivalent (Figure 10), and for women when measuring OWB in terms of assets owned. Only men display a positive correlation between changes assets held and changes in SWB.

Figure 10 Changes in SWB vs changes in OWB (expenditure per adult equivalent)

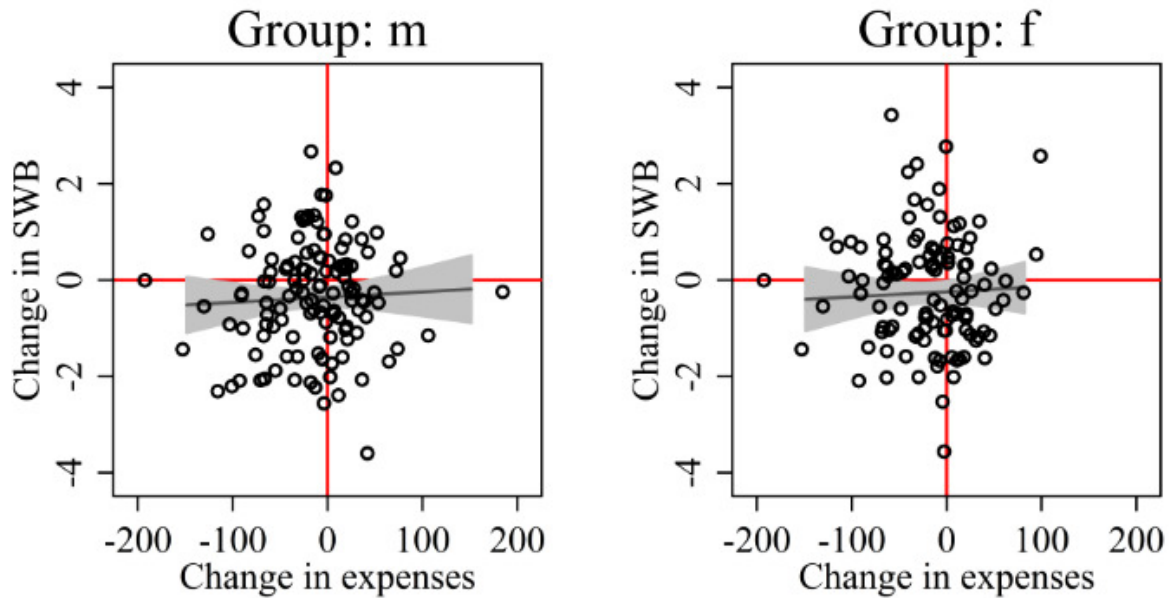
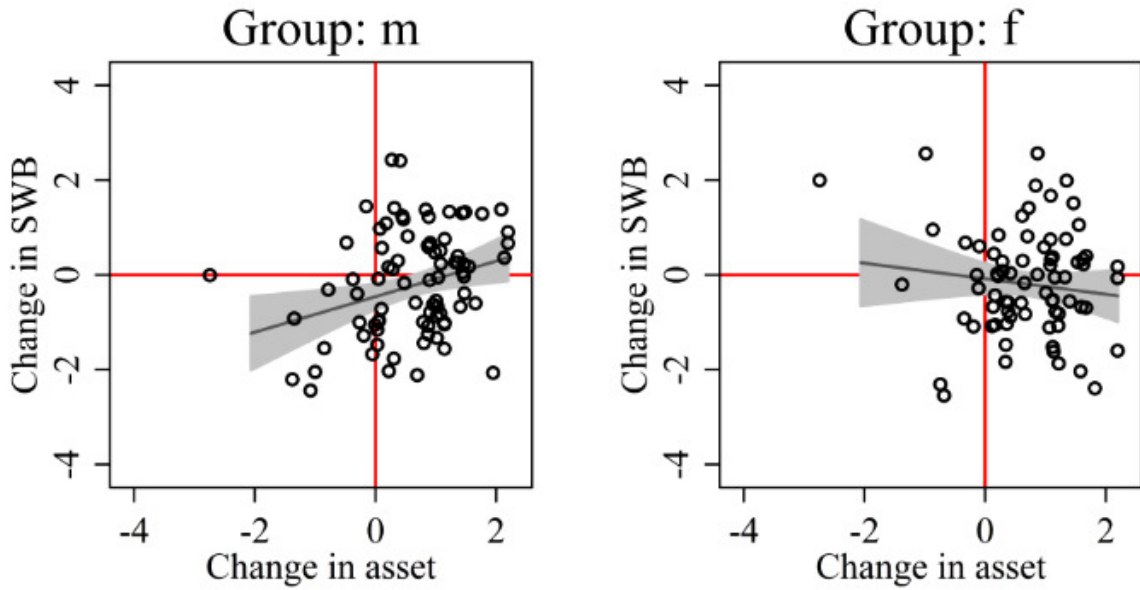
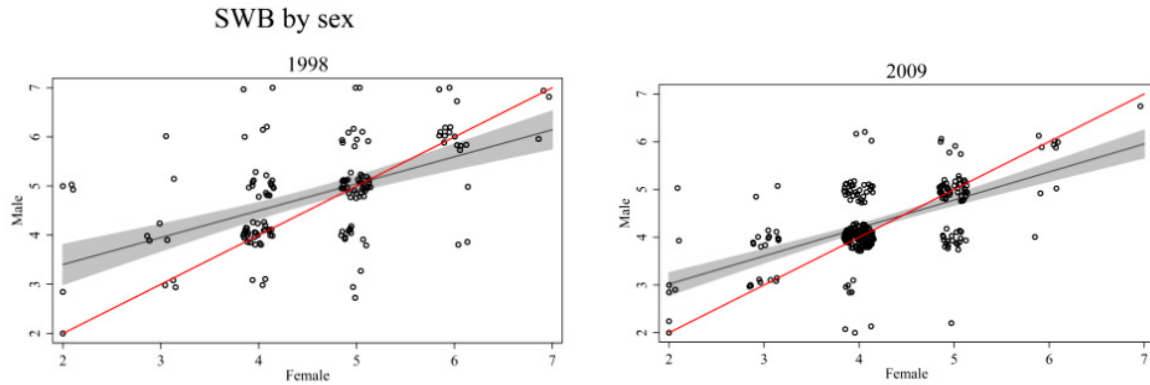


Figure 11 Changes in SWB vs changes in OWB (assets)



Similar to the Tanzania results in Figure 6, within the same household men tend to report higher SWB than women at lower levels of household SWB; and lower levels of SWB than women when household SWB is higher (see

Figure 12 Economic well-being (SWB) – head male vs female perceptions



Conclusions

Improvements in well-being are the core motivation for economic development. Economists have historically measured well-being using OWB indicators such as consumption or income. The recent literature has gradually added some SWB indicators. Either OWB or SWB indicators can be the appropriate choice, depending on the perspective and what one wants to assess. Indeed, a growing number of national and international institutions are moving towards measuring both OWB and SWB as indicators and target for development.

Conceptually, SWB depends on OWB as well as a wider range of dimensions of subjective and objective well-being, including health, social connectedness, inequality, safety, altruism, environmental factors, etc. It then is a largely empirical question to what extent OWB alone predicts SWB. At the macro level OWB tends to correlate with SWB, at least up to where basic needs are met, and with some evidence that this relationship extends to higher levels of well-being. The microeconomic evidence, in contrast, has repeatedly shown that changes in policy or circumstances can have an effect on SWB but not on OWB, and vice versa. Indeed, those findings have highlighted that SWB and OWB are not necessarily good proxies for one another and that there is important insights to be gained from analyzing levels and changes in SWB and OWB separately.

This paper adds to the burgeoning empirical literature on OWB vs SWB by adding the first examples from two Sub-Saharan African countries, Tanzania and Ghana, using both national representative data and a small survey. It also provides the first evidence, outside of Russia and Germany, of using panel data to correct for scale heterogeneity in SWB indicators.

The main results for both Tanzania and Ghana suggest that OWB and SWB not correlated in levels or in changes. Only in Ghana and for men is a small positive relationship. These results are in contrast to what the three prior studies using panel data to control for scale heterogeneity have found. This could be because SWB and OWB are truly less linked in Ghana or Tanzania. In the case of Ghana the lack of statistical significance could also be due to the small sample size. However, the Tanzania LSMS dataset is very large and the lack of relationship between SWB and OWB appears real.

The results that disaggregate by the type of SWB indicator and by gender show some interesting patterns. First, the correlation between different types of SWB indicators in Tanzania ranges from weak (0.10) to moderate (0.57). This supports conclusions from existing studies that one should collect information and examine a variety of different SWB indicators. Each SWB captures different, if perhaps overlapping, aspects of overall SWB. 'Life satisfaction' tends to be the most commonly used SWB indicator. In Tanzania, it also proves to be the SWB indicator that most closely relates with other SWB indicators, yet it does not constitute a SWB to encompass all others. Yet, 'life satisfaction' is not at all correlated with OWB, whereas subjective assessments of 'current economic circumstances' show weak correlation with OWB. The increasing use of SWB by national and international agencies as policy targets raises the demand for a 'composite SWB' indicator. Further work on how to identify the most relevant SWB indicators and how to combine these into a composite SWB index would be useful for policy makers and program evaluation.

Second, a consistent pattern of the relationship between OWB and SWB emerged by gender. Men tend to report feeling richer ('current economic circumstances') than women. In contrast, women report higher levels of SWB conditional on being in the same household. Women are more satisfied with what they have, whereas men believe they are richer, yet feel less satisfied!

The main result of no correlation between OWB and SWB implies that they are not good proxies for one another. Consumption survey data does not identify overall well-being. Conversely, SWB data do not offer a quick, dirty and cheap way to make inference about OWB. In Tanzania and Ghana the results suggest that policies aimed at improving OWB measures such as consumption cannot be expected to translate into improved SWB; much like other objective dimensions of well-being, such as health status, have been found not to respond to changes in economic well-being.

The lack of correlation has different implications for policy. First, for targeting and assessment, it means that if one is interested in both OWB and SWB then both types of data need to be collected. Second, with a lack of correlation and even movements in opposite directions, there are likely to be trade-offs between targeting OWB vs. SWB improvements.

It is possible that the lack of correlation is due measurement error of SWB and OWB in the data sources. It seems unlikely that OWB suffers from extraordinary measurement error because i) its consumption information in the LSMS and in the Ghana survey follow common, best-practice, and ii) the consumption data are in line with estimates from other sources. On the other hand, the SWB data in both Tanzania and Ghana were collected without the use of anchoring vignettes. Instead, this paper relied on fixed effects, the assumption that individual's interpretations of the rungs of the seven point economic ladder remain constant over time. Vignettes have been shown to very substantively reduce scale heterogeneity when collecting cross sectional data. They might have some impact when collecting information over time, too, as it is conceivable that there is an additional anchoring effect when the same respondents are reminded of the vignette stories when they are re-interviewed every few years. It would be very useful to test whether vignetting would further reduce unobserved scale heterogeneity, over and above person fixed effects. The potential additional gain from vignettes can then be weighed against the additional cost of data collection, and inform future panel survey design.

Compared to OWB measurement, SWB measurement is still in its infancy. This results in the paper underscore that many important questions remain particularly on the types of indicators to use, how to aggregate them, and how to improve the quality of SWB information effectively and efficiently.

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