Welfare Dynamics and Loss Aversion

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Abstract

Measures of individual welfare dynamics have so far ignored the insights from behavioral economics with regard to decision making. We argue that especially the issue of reference dependent utility is of high relevance for the measurement of welfare dynamics under uncertainty and propose a new measure that goes back to the value function of Kahneman and Tversky (1979), where the utility of an individual is not only a function of his or her current income but also of his or her reference point, i.e. his past income. We demonstrate the implications of our proposed measure with panel data from Germany and Madagascar and compare it to other recently proposed measures of welfare dynamics.

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Key words: Welfare Dynamics, Vulnerability, Behavioural Economics, Loss Aversion.

Extended Abstract

In recent years, the research agenda on poverty in developing countries has moved not only beyond money-metric to multidimensional measurements of poverty but also beyond static assessments of poverty, considering dynamic aspects of poverty. This research acknowledges (i) that the currently observed wellbeing of a given individual might not necessarily be a good approximate of his wellbeing over time as well as (ii) that the notion of risk and uncertainty is incorporated into measures of wellbeing.

This research has led to numerous definitions and measurements broadly summarized under the term *vulnerability* (for an overview see e.g. Hoddinott and Quisumbing, 2003). Despite differences in the risk and time sensitivity of the proposed measures, all are more or less based on the theory of expected utility, going back to Bernoulli (1738) and Cramer (1728), which has long been the main positive and normative theory not only to analyze individual decision making under risk but also to analyze individual welfare under risk. The underlying assumption is that individuals' economic decisions reveal certain preferences, which can also help to determine the welfare of individuals.

In decision making theory, expected utility theory has long been complemented by the insights from behavioral economics and or experimental economics (see e.g. XXX). Just as well, the measurement of expected and experienced utility might also be enriched by the findings from economic experiments. Several authors have brought together the theory of behavioral economics and social welfare (see Bernheim and Rangel 2007 for an overview). However, individual welfare measures over time and under risk have so far ignored the evidence of behavioral economics. Dercon (2005) is the only reference we found that noticed that behavioral economics might enrich our measures and analysis of vulnerability.

Most relevant for dynamic and risk-sensitive welfare measures is the experimental evidence on 'reference dependence', 'loss aversion' and 'diminishing sensitivity', all going back to the path-breaking paper of Kahneman and Tversky (1979). Reference dependence refers to the fact that outcomes (i.e. income) are

evaluated as gains and losses with regard to a reference level - in contrast to expected utility theory where absolute outcomes are valued. Loss Aversion captures the experimental evidence that losses have a higher impact on wellbeing than gains. Diminishing Sensitivity means that the marginal utility of both gains and losses decreases with size.

These issues should be of high relevance not only for decision under risk but also for the measurement of welfare dynamics under risk, which will be argued in the following paper. Indeed, in a recent empirical study D'Ambrosio and Frick (2007) found that past incomes and the related question whether an individual is now better or worse off (relative to the past) have a significant effect on income satisfaction. However, the authors do not interpret the huge numerical difference associated with being better or worse off, although the effect of one's history in their regression is up to 15 times larger for losses than for gains, which might be a first empirical evidence for loss aversion also with regard to experienced (and not only expected) utility.

In this paper we will first theoretically incorporate the experimental evidence on decision making under risk - namely reference dependence, loss aversion and diminishing sensitivity - into dynamic welfare measures. In a second step, the proposed measure will be applied to a small illustrative example of various income trajectories and be compared with other recently proposed dynamic welfare measures of Jalan and Ravallion (1998), Pritchett et al. (2000), McKay and Lawson (2003), Ligon and Schechter (2003), Calvo and Dercon (2006) and Foster (2006). Last, we apply all measures to panel data from Germany and Madagascar.

The paper is structured as follows. After the Introduction, in Section 2 we give a brief description of the concept of vulnerability as well as recently proposed measures and derive some reasonable axioms for the measurement of welfare dynamics of the poor. Section 3 gives a short introduction into the theory of reference dependent utility. In Section 4 the two strands of literature are brought together to propose a new measure of vulnerability. Section 5 demonstrates the implications of the new measure for panel data from Germany and Madagascar. Section 6 concludes and gives an outlook on further research.

References

Baulch, B. and J. Hoddinott (2000). Economic mobility and poverty dynamics in developing countries. *Journal of Development Studies*, 36: 1-24.

Benartzi, s. and R.H. Thaler (1995). Myopic Loss Aversion and the Equity Premium Puzzle. *Quarterly Journal of Economics*, 110: 73-92.

Calvo C. and S. Dercon (2006). Chronic Poverty and All That: The Measurement of Poverty over Time. *CPRC Discussion Paper*, Chronic Poverty Research Center, Manchester.

Chaudhuri, S. (2003). Assessing vulnerability to poverty: concepts, empirical methods and illustrative examples. Mimeo, Columbia University, New York.

Chronic Poverty Research Centre (2005). *The Chronic Poverty Report 2004-05*, Chronic Poverty Research Center, Manchester.

D'Ambrosio, C. and J.R. Frick (2007). Individual Well-Being in a Dynamic Perspective. *IZA Discussion Paper*, 2618, IZA, Bonn.

Dercon S. (2005). Risk, Vulnerability and Poverty in Africa. *Journal of African Economies*, Advance Access, September 5.

Foster J. (2005). A Class of Chronic Poverty Measures. *CPRC Discussion Paper*, Chronic Poverty Research Center, Manchester.

Fields G. (2002). The Meaning and Measurement of Income Mobility. In: Fields G. *Distribution and Development. A New Look at the Developing World*, The MIT Press, Cambridge.

Foster, J. E., J. Greer and E. Throbecke (1984). A Class of Decomposable Poverty Indices. *Econometrica*, 52: 761-6.

Gilboa, I. and D. Schmeidler (2001). A Cognitive Model of Individual Well-Being. *Social Choice and Welfare*, 18: 269-288.

HODDINOTT J. AND A. QUISUMBING (2003). Methods for Microeconometric Risk and Vulnerability Assessments. *Social Protection Discussion Paper* 0324, The World Bank, Washington D.C.

Jalan, J. and M. Ravallion (1998). Transient Poverty in Post-Reform Rural China. *Journal of Comparative Economics*, 26: 338-357.

KAHNEMANN D. AND A. TVERSKY (1979). Prospect Theory: An Analysis of Decisions under Risk. *Econometrica*, 47: 263-291.

KAHNEMANN D. AND A. TVERSKY (1991). Loss Aversion in Riskless Choice: A Reference-Dependent Model. *The Quarterly Journal of Economics*, 106(4): 1039-61.

KOSZEGI B. AND M. RABIN (2006). A Model of Reference Dependent Preferences. *The Quarterly Journal of Economics*, 121(4): 1133-1165.

KOSZEGI B. AND M. RABIN (2006). Reference-Dependent Risk Attitudes. *Working Paper*, University of Berkeley, Berkeley.

LIGON E. AND S. SCHECHTER (2003). Measuring vulnerability, *Economic Journal*, 113: 95-102.

LOEWENSTEIN, G. AND D. SCHKADE (1999). Wouldn't It Be Nice? Predicting Future Feelings. In D. Kahneman, E. Diener, and N. Schwartz (eds.). Well-being: The Foundations of Hedonic Psychology. *New York: Russell Sage Foundation*: 85-105.

PRITCHETT, L., SURYAHADI, A. AND S. SUMARTO (2000). Quantifying Vulnerability to Poverty: A Proposed Measure, with Application to Indonesia. *SMERU Working Paper*, The World Bank, Washington D.C.

VENDRIK, M. AND G. WOLTJER (2006). Happiness and Loss Aversion: When social participation dominates comparison. *IZA Discussion Paper*, 2218, IZA, Bonn.