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Abstract

In the recent past, growing attention has been devoted to the attempt to correctly include considerations of exposure to risk in the discussions on poverty reduction and, more generally, economic and social development. The purpose of this article is to take stock of all these efforts and to reconsider the relationship between poverty and exposure to risk. We present a short review of current practices of vulnerability measurement to discuss how none of them is truly consistent with an *ex-ante* view of assessing the true consequences of risk exposure. We argue that one way of addressing this inconsistency is by adding an estimate of the insurance cost needed to guarantee a socially accepted minimum level of welfare to the level of consumption expenditure taken as a benchmark to identify the poor. In other words, we define an *augmented poverty line* where the traditional absolute poverty benchmark level is marked up by the estimated cost of insuring against what are considered socially unacceptable risks. We then discuss the practical implications for implementing such a measure and future research directions.

Keywords: Poverty, Risk, Vulnerability, Insurance
JEL-Codes: I3, G22, O12

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I. INTRODUCTION

In recent years, a growing attention has been devoted to the attempt to correctly include considerations related to the exposure to risk in the discussions on poverty reduction and, more generally, on social and economic development. That exposure to risk is harmful ought to be an undisputed fact. Many have recognized that one of the recurrent characters of human activity is an attempt to reduce the degree of uncertainty that surrounds the future. In the context of economic development, it has also been widely recognized that such attempts may sometimes have negative consequences in terms of growth potential, a potential that could be more fully expressed if only better ways to deal with the uncertainty were available.

In this sense, two justifications for public interventions aimed at reducing the exposure to risk and/or the consequences of shocks emerge. First, since insecurity is welfare reducing, public actions to ensure a minimum level of security for everyone may be necessary. Second, private actions to reduce exposure or to cope with the consequences of uninsured events might be too costly and inefficient from a societal point of view.

While there is widespread agreement on the merits of these two justifications, much more disputed seems to be how to actually *measure* both the degree of exposure to risk (i.e., what is typically termed "vulnerability") and its negative consequences in terms of welfare. In order to measure these, one would need to assess *who* is more exposed and *how bad* a given prospect is. Such quantitative measures are required to assess issues like the welfare cost attributed to risk, distributional consequences and targeting.

The aim of this paper is twofold. First, we discuss the conceptual problems that must be confronted when trying to define the welfare cost of *exposure* to risk, and how recent work has tried to address them. We argue that the main, partially unresolved, challenge has been to identify behavior motivated by the forward looking attempt of trying to prevent or limit the consequences of anticipated risk from behavior derived by the need to cope with

the realization of shocks. Lacking such identification implies making an incomplete and potentially incorrect assessment about risk exposure and policy directions.

Second, we introduce a conceptually simple approach to include risk exposure considerations within poverty indicators. We argue that by directly embedding risk in the measurement of poverty, such a measure becomes truly forward looking and avoids the many assumptions used in the existing methodologies. While the practical demands of implementing such an approach are indeed great, we discuss directions for future work and research on data collection and analysis that can be done to simplify and make it operational.

The paper is organized as follows. Section 2 reviews the existing literature on vulnerability indicators. Two concerns are identified. First, and perhaps less important, a certain degree of confusion seems to permeate the practical uses of the terms *poverty* and *vulnerability*. Such confusion should be resolved before going deeper into specific aspects of measurement, which is discussed in section 3. Second, and more important, we argue that a fully consistent way of addressing the welfare consequences of the exposure to risk, and therefore to correctly provide guidance for welfare increasing policies in uncertain environments, is yet to be found. Section 4, introduces a simple concept of an "augmented poverty line" which integrates risk in poverty measurement. Section 5 discusses the practical implications of estimating such a measure and how future work can be directed to simplify and broaden its implementation. Section 6 concludes.

II. POVERTY AND VULNERABILITY

Merriam Webster Dictionary (on line version, 2005) defines poverty as "*the state of one who lacks a usual or socially acceptable amount of money or material possessions*." This definition of poverty has been expanded over the years to include such aspects as access to

social and political rights and to a wide array of other non material basic needs,[3] up to the most recent attempts to include consideration related to 'security' (World Bank, 2001.)[4,5]

This view recognizes, at least in principle, that insecurity is in itself a source of discomfort and hence it causes a reduction of welfare or well-being.[6] Such a view is widely accepted, and very few now seem to dispute that any civilized society should grant its members access to the means and opportunities to reduce the level of insecurity up to a socially acceptable level. Such an (equity) argument could – and should – be considered a sufficient justification for the provision of social protection, which thus become an essential component of any development oriented policy.

Nonetheless, a well designed and correctly targeted social protection system may also be a factor to boost economic growth (Dercon, 2005). The rationale behind such a position is that, to try and eliminate uncertainty, the poor are often forced to employ the limited resources they possess in activities with low returns, but which assure a minimum level of consumption. By providing them with more security, they could mobilize resources into activities with higher returns, thus effectively promoting growth. This argument is also a response to skeptics of social protection, who question the efficiency of costly social protection interventions in the context of limited financial resources, which – they claim - could be better invested instead in more efficient activities.

Nonetheless, none of the justifications above explain what a "well designed" and "correctly targeted" social protection system is. A debate has therefore formed and efforts have been devoted to try and understand how to design policies aimed at reducing uncer-

[3] The most influential work on the broadening of the view of poverty can be traced back to Amartya K. Sen, but many have been contributing to the process so that a comprehensive list of references would be too long to be put here.

[4] "Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, *is fear for the future*, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom" (The World Bank, 2001).

[5] A synthesis of the views that have led to the formation of a consensus on the fact that the uncertainty about the future must be considered when discussing of policies aimed at poverty reduction can be found in the 2000/2001 World Development Report of the World Bank (The World Bank, 2001).

[6] Many times, the words *risk* and *uncertainty* are used to indicate what we call *insecurity*, for example when talking about the "welfare consequences of the presence of risk". We note that it is not the presence of risk (i.e. the randomness of future events) *per se* that matters but rather it is the resulting feeling of insecurity that may motivate current actions to avoid its persistence.

tainty and how to target them so that they would be efficient in terms of promoting equity and growth.

Within such debate, the word "vulnerability" has come to widespread use, even though sometimes in ways that may lead to confusion.[7] Two main definitions emerge. First, in a broad sense, vulnerability is considered as *the condition of being at risk of any potentially harmful event*, and, as such, it is something that should be avoided. In such a view, vulnerability reduction objectives are distinct and as legitimate as poverty reduction objectives. Taken from this perspective, although there might be synergies among the two objectives (for example through considerations such as that the poor are more vulnerable), such definition is not necessary to justify a role for social protection.

A second definition uses the word vulnerability in a narrower sense to mean *vulnerability to poverty*, i.e. the possibility of becoming or remaining materially poor in the future. Therefore, the fundamental policy objective remains that of reducing poverty, although intended more as potential rather than current poverty and social protection becomes justifiable also on the grounds that it remove constraints to growth.[8]

It is this second view which permeates the recent work aimed at *measuring* vulnerability, as recently reviewed by Hoddinott and Quisumbing (2003), Ligon and Schechter (2004), and criticized by Elbers and Gunning (2003). We do not duplicate their review here; rather, we note that even an optimistic survey of this literature leaves the reader with a general sense of skepticism on the possibility to use any of the existing measures of vulnerability in a fully satisfactory way.

Following Hoddinott and Quisumbing (2003), individual measures of vulnerability can be classified as: (a) indexes of expected poverty (VEP), i.e., the probability that the individual household will fall below the poverty line, (b) indexes of expected utility (VEU), i.e. the distance between the utility that would be achieved by receiving an appropriately chosen level of consumption with certainty and the expected utility of the household given its uncertain prospects: and (c) measures of the cost, in terms of consumption, of the exposure to (uninsured) risk (VER), as inferred by the proportion of observed change in consumption attrib-

[7] See Alwang, Siegel and Jørgensen (2001) for a synthesis of views on vulnerability from various disciplines.

[8] Holzmann (2003).

utable to past shocks. Each of the three types of measures has its own merits and problems, as exhaustively described by Hoddinott and Quisumbing (2003) and by Ligon and Shechter (2004). Nonetheless, all the proposed measures have two key problems that remain unresolved.

First, in any conceivable practical implementation, the use of observed *outcomes* from the past will be needed to infer the future distribution of *events*, which requires that strong assumptions are made on the unobserved *behavior*.[9] To deal with this, the existing approaches give up the possibility of estimating behavioral parameters, and assume, for identification purposes, that the structure of the preferences is known either explicitly (as in the VEP and VEU measures) or implicitly (as in the VER measures).[10] As Ligon and Schechter (2004) note: *"One claim advanced for (at least utility-based) vulnerability measures is that they avoid the paternalism inherent in poverty measures by reflecting the preferences of the household themselves. However, while there's working consensus in the empirical literature on what functions usefully reflect household risk preference (the HARA class), this still leaves at least one free parameter. […] Estimating preference parameters will require the analyst to observe the outcomes of h*ou*sehold decisions (e.g. savings decisions, labor supply, etc.) which depend in part on risk attitudes.*" Even the innovative procedure of setting up a dynamic structural model of households' behavior (suggested by Elbers and Gunning, 2003) does not solve the problem of estimating the distribution of future events to be used to measure vulnerability.

Second, to implement them in practice, these techniques need to rely (to various degrees) on assumptions of stationarity and measurement error. That is, to be able to infer the *future* distribution of all possible outcomes from the observation of past realizations, the analyst would have to assume that the future is going to be similar to the past (a stationary world). Even if one did not want to assume this, there is a big practical problem since in order to evaluate the stationary (or not) nature of the distribution of consumption necessitates the use of long time-series household data, hardly available in most policy settings. Similarly,

[9] Manski (2004).

[10] Note that even in measures of vulnerability which do not require the explicit definition of a utility function, such as the VEP measures, an assumption on the household's attitude towards risk is implicit (see Hoddinott and Quisumbing, 2003).

confounded with the stationarity assumption is the existence of measurement error in consumption data which is assumed away in many of the approaches. These are key limitations that make existing techniques difficult to apply them operationally.

A crucial point of these issues is that, at least the way in which they have been applied so far, all these measures are truly *backward-looking*. This is unsatisfactory because the very concept of vulnerability is a forward-looking one: it should capture the welfare consequences of *exposure to risk*, not that of *having been subject to shocks.* The existing measures and type of available data used cannot identify between these two elements, including when using utility theory for identification. As put by Alwang, Siegel and Jørgenson (2001): "*While it is possible to measure losses ex-post […], these are only the static outcomes of a continuous process of risk and response. Vulnerability is the continuous forward looking state of expected outcomes. Ex post welfare losses are neither necessary nor sufficient for the existence of vulnerability. Welfare losses, in and of themselves, are not sufficient to identify a household as vulnerable.*"

Perhaps what it is truly at the heart of this impasse is the fact that all attempts at embedding the concept of vulnerability within poverty analysis have not explicitly reconsidered the concept of poverty at its roots. In this sense, the natural direction of embedding risk in poverty seems to be one that unifies the view of vulnerability and poverty. The next session explores this further.

III. VULNERABILITY AS POVERTY

As discussed above, vulnerability has up to now been defined in either referring to a general condition of being exposed to potentially harmful events or by focusing on risk exposure and its impact on *future* poverty i.e. the risk of remaining or becoming poor (where poor usually refers to a well defined low level of consumption). Still, the existing attempts to give a practical working definition to vulnerability have maintained a distinction between a static concept of poverty and a forward looking concept of vulnerability.[11]

[11] A similar point has been made by Alwang, Siegel and Jørgensen, 2001. However, they insist that "*Poverty and vulnerability are not synonymous*" observing that "*Many households that are now not poor are certainly vulnerable to falling into poverty. But vulnerability to poverty, using common economic definitions of poverty,*

We stress instead that such a distinction is misleading: a person who cannot provide for the means to appropriately manage risk ought to be considered poor. In other words, we make no fundamental difference between the concept of poverty and that of vulnerability. That is, a person is poor precisely because he does not possess sufficient resources to insure against all the risks whose possible consequences are deemed as socially intolerable. The list of such risks, far from being absolutely defined in both geographical and historical dimensions, always starts with the risk of dying of starvation, but grows to include the risks that, over time, societies recognize as no longer acceptable. In a way, the term *development* itself could be intended as the joint process of enlarging the list of intolerable risks and the provision of the means to insure against them to the greatest possible number of people.

This view also recognizes that poverty must be considered an ex-ante and forward looking concept (indeed a view that is shared by the recent work on vulnerability). Still, what matters is not the future potential outcome per se, but rather the conditions under which people are bound to face their uncertain future. The simple awareness of possible shocks is in itself a cause of distress or sub-optimal behavior and therefore imposes a welfare cost. The fact that a shock did not realize does not imply that people were not vulnerable to its risk. In this sense, the observation that people have been "lucky" doesn't mean that they did not suffer a welfare loss. As such, to provide them with the means of feeling more secure must be considered a welfare improving action, and to identify those who are - for whatever reason - less equipped to face their uncertain future and feeling secure, seems like a good way of targeting policies.

One consequence of this is that virtually all measures of vulnerability that have been proposed so far need to be questioned. Even when in principle they can be presented as forward looking (as one could take, for example, the concept of the "probability of being poor in the future"), the way they are applied is based on the observation of ex post losses.

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is not the only form of vulnerability that exists. Many non-poor are vulnerable to poverty and also to other negative outcomes."

If the inability to insure against risk is poverty, all we need to do is to attempt to measure the monetary costs that would be normally required in a given environment to insure against the most dangerous and frequent risks. This only requires a calculation of the cost of *insurance*, not the costs of *risk exposure*, the first one being, at best, a lower bound for the second.

IV. THE 'AUGMENTED' POVERTY LINE

Integrating the "inability to insure against risk" directly into poverty measures is conceptually simple: it amounts to redefining the typical poverty line to account for the cost of insurance. In this sense, it is equivalent to the exercise of choosing the composition of the "typical basket" of goods and services (as is done in current poverty work) by including the cost of insuring against unacceptable risks. An *augmented poverty line* can be therefore defined as the:

> *"poverty line that includes the minimum amount of consumption required to achieve basic needs **plus** the cost needed for acquiring enough insurance."*

`Enough' means sufficient to cover the exposure to those risks that are deemed socially unacceptable, while 'insurance' must be intended in a **broader** sense than that of a market-traded formal insurance contract, as including all actions which, in exchange of some sort of either implicit or explicit monetary payment, will eliminate most or all the negative consequences of the events being considered. The value added (at least from the conceptual point of view) of such a definition is that it directly embeds risk exposure and insurance costs into the definition of poverty.

In this setting, measuring the consumption gap for household *i* (that is, the distance of a household's consumption from the augmented poverty line) is given by:

$$\tilde{g}_i = [(z + \eta_i) - y_i] \qquad (1)$$

where z is the traditional poverty benchmark (that includes food and non-food items), η_i is the (idiosyncratic) cost of insurance against the predetermined set of risks that the household is not able to insure, and y_i is household i's measured consumption expenditure. [12]

Given $\tilde{g}_i$, traditional measures of poverty in the tradition of Foster *et al*. (1985) can be simply calculated in the usual way:

$$P_\alpha(y, \eta, z) = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{\tilde{g}_i}{z+\eta_i}\right)^\alpha \qquad (2)$$

where n is the total population and q is the population below the augmented poverty line ($z + \eta_i$).

The observation that η_i can be (to a large extent) strictly idiosyncratic raises one practical complication: can one really measure η_i? While there are a number of challenges in doing so (discussed below), they are conceptually not very different from encountered in existing poverty measurement methodologies. For example, poverty lines often use different "typical baskets," like distinguishing between the *extreme* (focusing on the inability to afford a basic food basket) and *general* (which adds to the cost of the food basket the cost of essential non-food items). Similarly, different poverty lines can arise when considering the heterogeneous costs and composition of "typical baskets" across regions (e.g. between rural and urban areas). In this sense, the observation that poverty lines have a large idiosyncratic component is not new and as such, our proposal to add a new component (i.e. risk) is just a natural extension of existing practices.[13]

[12] As an extreme example, consider two identical households (1 and 2) with the exact same level of monetary wealth, living in the same natural and economic environment, thus facing the same natural and economic hazards. According to our criterion, they could be located differently relative to the augmented poverty line because of their different ability to manage risk due, for example, to different average levels of education. In this context, a targeted educational program would be the best way to tackle the issue as it would be reflected by its effect of reducing the "uninsured cost of risk management" (η_i) for the less educated household.

[13] Distinguishing idiosyncratic from covariate risk is indeed complicated. In principle, idiosyncratic risk can be mitigated by risk sharing within a specific social group or network. As such, an idiosyncratic risk at the household level would only become an issue if that household's social network failed to eliminate it by risk sharing. In this sense, a "community" is precisely the minimum required size of a group of people needed to effectively share the most perilous idiosyncratic risks. When risks are so systemic that they cannot be shared within the "community", the need of external intervention (e.g. from within a more aggregated "community" level such as the state) arises. In this context, a "community" can refer to anything from an individual, a household, a village etc., within which risk can be effectively shared. This implies that the augmented poverty line can be extended to not necessarily households but instead villages or regions, which may be practically easier.

Still, the fundamental problem that remains to be addressed is how to actually measure the cost of insurance to be added to the static poverty line. Conceptually, we distinguish the following three steps:

1. Identify the possible risks to be included in the poverty measure;
2. Estimate the cost of insurance for such risks for each household *i*;
3. Calculate $\tilde{g}_i$ for each *i* and determine the aggregate poverty indicator.

Risk identification

In general, the insurance cost η_i will be the sum of various risks: overall macroeconomic risk; covariate, village level risk (such as weather risk); and household specific, idiosyncratic risk (such as health risk), and it can be constructed accordingly by considering one type of risk at a time. Cataloguing and incorporating all possible risks is of course beyond reach both in terms of data requirements but also from a practical point of view. We argue that it is not necessary to embed all possible risk components before being able to derive sensible conclusions on the relevance of specific risks.

A first step is therefore to identify which risks are considered socially unacceptable, and therefore insurance against which should be considered part of the "basic needs". While there will still be large inter and intra country differences in how one should prioritize, a simple review of existing poverty and vulnerability analyses suggests that it may not be so difficult.[14] Indeed, recent use of "risk modules" in household level analysis could serve as a guide as to what is considered an important risk. For example, droughts and malaria are perhaps two of the most easily identifiable and frequently reported shocks facing rural populations in many countries. Assessments to incorporate risk in poverty work would therefore include weather and malaria risk for rural populations in the poverty line calculation.

The cost for insurance

Having defined a set of risks for relevant populations, calculating the cost of insuring against each one of them is perhaps the most challenging part of the approach. The problems

[14] See Hoogeveen et al. (2004) for a review of common practices.

arise from both the idiosyncratic nature of "risk exposure" and from the fact that in many settings (especially in developing countries), such a cost will at best be a simulated one due to the absence of formal insurance markets for that specific risk. Fortunately, a vast literature exists that has addressed such problems, which we think can be explored to tackle some of these issues.

Theoretically, the cost to be considered should be analogous to what in the insurance literature is defined as an *actuarially fair* premium. Where formal insurance markets exist and are well developed, the prevailing market premiums can be used as proxies for the fair premium, possibly after adjustments for transaction costs due to problems of information and/or lack of competition in the supply of insurance.[15]

In the most common cases where formal insurance markets are not well developed, the analysis will need to focus on *simulating* an insurance market. To do so, an estimate of the following will be needed: (a) *the probability distribution* of the risky events, and (b) *the associated loss* for all households exposed to the risk. The hypothetical actuarially fair premium can then be calculated as the average expected loss, i.e., the premium that would clear a market with complete risk sharing.

Information needed to estimate the distributions and the potential losses due to hazardous events can be sought for in the records of past outcomes, although we must stress that the losses and probability of events should be measured separately and as much directly as possible, trying to avoid the need to impose unjustified behavioral assumptions for identification purpose. The point is that past outcomes carry only *partial* information on events that *might have happened* but did not happen and the anticipation of which likely affected behav-

[15] In many cases, when households have bought a specific insurance (e.g. health insurance), the insurance premiums paid can be potentially included in the aggregate expenditure measure y_i (a common practice in consumption aggregate calculations). In such case, the premiums paid should be subtracted from the calculated consumption gap g_i before assessing the household's poverty status. If a household has bought insurance, in fact, it is no longer exposed to the specific risk, and therefore nothing would be added to its poverty benchmark (i.e., $\eta_i = 0$). However, if we don't subtract the premiums paid from the consumption gap, we would penalize this household compared to an exactly similar household which has been more risk taking by not sacrificing consumption to buy insurance (i.e. while g should be the same for both households, y will be lower for the latter. Still, given that, in most developing countries, formal insurance markets where actual premiums are paid – especially by the poor - are very rare, we believe that this problem is more a conceptual than a practical one.

ior. Moreover, this partial information is necessarily confounded with the effects of events which *happen to materialize but that had not been anticipated*.[16]

Once this premium, call it π_i, is estimated, it must be compared to the opportunity cost of eliminating the negative consequences of the same event by engaging in preventative actions, such as, for example, by changing cropping patterns (*risk skewing activities*, as defined by Dercon, 2005) or by investments.

As an example, consider a situation where the only relevant risk is that of drought. To avoid damages, a farmer could either diversify its crops (i.e., by selecting the best drought resistant ones) or invest in digging a well. Both actions imply a cost. The minimum cost of diversification, say $C_{1,}$ could be assessed through the calculation of the foregone average income when cultivating the best feasible drought resistant crop instead of the most common drought susceptible crop. Data should usually be available on both types of crops from surveys of farms in the region or in similar regions. On the other hand, the effective cost of getting irrigation water by digging a well might depend on such things as the depth at which the water can be found; the nature of the soil; the available digging technology; the expected quality of water, and so on. The total cost of the investment should then be annualized using an interest rate which is representative of the prevailing credit conditions to get the comparable annual cost $C_{2.}$ The opportunity cost of insuring against drought, OC_i could then be determined as $OC_i=\min\{C_1, C_2\}$. Then, the (conservative) measure, η_i, to be added to the income benchmark will be:

$$\eta_i = \min\{\pi_i, OC_i\} \qquad (3)$$

Once η_i is calculated for each household *i*, the gap $\tilde{g}_i$ and the aggregate poverty measures can be then computed using Eq. 2.

V. DISCUSSION AND IMPLICATIONS FOR FUTURE RESEARCH

There are a number of benefits associated with this approach. First, the procedure builds upon the long standing experience and widely accepted use of poverty indicators of

[16] This is precisely where the identification problem arises and where the imposition of behavioral assumptions taken from the expected utility framework is unsatisfying.

the class of the P_α measures of Foster *et al.* (1985), and that, therefore, does not require abandoning the wealth of developed expertise and data in poverty analysis.[17]

Second, the method clearly distinguishes between the ex ante exposure to risk and the ex post effects of shocks. Only the ex-ante exposure to risk is included as a dimension of poverty. What we add to the traditional poverty line is *not* an estimate of the expected income loss or of a monetary measure of the expected utility loss, which would depend, given the commonly available data, both on past actions taken and realizations of shocks; the sum η_i we suggest to use ought to represent the cost of uninsurable risk exposure only, thus reflecting the ex-ante perception of what the risk might imply.[18]

Third, we do not need to devise a set of new indicators, and therefore we do not need to come up with arbitrary ways of weighing them. For targeting purposes, the only needed one is an indicator of poverty. Any policy could then be targeted to the poor, and evaluated according to whether or not its implementation might reduce some measure of poverty incidence (which now incorporates risk as well). Similarly, since z and η_i are calculatedly separately, one could compare the relative importance of each, facilitating targeting and policy design.

Forth, the paradox of households that, based on a concept like "vulnerability as expected poverty", would be considered "non poor, yet vulnerable to risk" is resolved: once the cost of insurance is assessed, no ambiguity exists in classifying a household as vulnerable and *therefore* poor, or not.

Fifth, poverty reducing programs can also be evaluated based on their risk management capacity. That is, they could be ranked simply in terms of the extent to which they reduce the broadly defined poverty measure which now incorporates risk. For example, pro-

[17] For example, to report on the importance of considering risk related issues and assessing vulnerability, Kamanou and Murdoch (2002) compare their aggregate vulnerability index with the change in observed headcounts and conclude that the observed change in the traditional headcount of poverty can be misleading in identifying areas prone to poverty. Our approach would address the exact same concern, by providing a more robust measure of the observed headcount, where robustness refers to the inclusion of risk exposure concerns explicitly in the poverty measure.

[18] Notice that the equilibrium insurance premium and the (money metric) expected utility loss might be equal only in an ideal *exchange* economy with *rational expected utility maximizing* agents and fully developed *perfectly competitive* contingency markets *à la* Arrow (1965), something that may bear little resemblance to real world situations. In practice they are not equal and it something to bear in mind.

grams that directly provide free insurance opportunities to the poor, by reducing the cost of insurance to be added to the poverty benchmark, would certainly decrease poverty incidence.

Nonetheless, the feasibility of calculating η_i remains a huge concern. While conceptually the approach is simple, there are a number of constraints and challenges in order to make it operational. For one, the mere concept of trying to calculate η_i for every potential risk in a given context seems impractical (if not impossible). The data requirements are huge considering the following demands: (i) deriving a list of risks to be considered, potentially for each household; (ii) the need of information on risk premiums, something that can be complicated in many settings where insurance markets do not exist; (iii) costing alternative risk prevention instruments that can then be compared to insurance. At the same time, the set of assumptions and data challenges for many of these issues are not qualitatively different that those done in existing poverty measurement work. Below, we outline some directions where further research could address some of these concerns.

Targeting and aggregation

The idiosyncratic nature of η_i implies a huge information cost in its calculation. One direction to address this is to conduct such calculations at a more aggregate level. That is, one simplification would be to consider large covariate risks (such a weather variation) which by their nature affect a large number of households. In this case, we could calculate η_i (e.g. the minimum cost of weather insurance premiums or irrigation) for all (potentially farm) households within a particular region exposed to weather variation.

Such an "aggregation" concept is akin to poverty mapping methodologies recently developed that aim at measuring poverty rates at lower administrative units (like municipalities) by aggregating household level poverty estimates, thus improving precision.[19] Following the weather example, data on rainfall variation (collected from weather stations) can be used to define drought prone regions, while rainfall insurance premium information and the cost of other prevention instruments (like the cost of a well) can be obtained either by local insurance companies if they exist (many countries have currently a number of rainfall insurance pilots), or by estimating them. Once such a premium is calculated, a comparison can be

[19] Elbers et al. (2002).

made with the opportunity cost of eliminating the negative consequences of the same event by engaging in preventative actions.

With the minimum cost η_i calculated (now *i* referring to a specific region or municipality), it can be added to a regional poverty line (which by definition affects all households in that region). Further modifications and adjustments can be made to improve precision, for example by excluding non-farm households or households that already have taken steps to manage rainfall risk. In such an example, regional poverty estimates would directly account for the risk of drought and therefore provide an instrument for targeting which includes both risk and non-risk welfare considerations.

Data requirements and future directions

Much of the data required to do the calculations we discuss are indeed available. For example, existing *consumption expenditure data* such as those available through the Living Standard Measurement Surveys (LSMS) is already used to assess the welfare status of each household. In addition, existing data on the *production structure* of the household, collected either within the same LSMS or through other *farm/family business* surveys, might prove useful in estimating some of the insurance costs parameters delineated above (see the example on drought). In particular, two conceptually separated pieces of information can be extracted, namely the probability of the events occurring, and the loss caused by them. Similarly, data collected from ongoing existing and pilot programs aiming at promoting development of insurance instruments in developing countries might also be very helpful. Such data potentially include information like the willingness to pay for insurance, market based insurance information or data to assess insurance premiums.

A number of new areas of research in survey design can also facilitate data needs with respect to welfare and risk. For example, new modules on shocks and risks have been included in a handful of household surveys. While more work needs to be done to better refine these modules, developing them further would facilitate this by allowing the identification of the list of risk to be considered, perhaps less so in evaluating the cost of insurance.[20]

[20] In other words, we can include questions like: "what is it that you fear?" rather than "what did you do" or "how much would you pay to avoid something?" Answers to this second type of information could be affected

In addition, recall questions may be used to construct a household's history and decision making process along various dimensions (including decisions under uncertainty). This can be done either by revisiting households from an existing household survey or by using retrospective questions during the collection of new data. Such modules can also include risk perception modules that could be used to construct risk distributions.[21] Similarly, existing work on subjective welfare may be used to incorporate risk in measuring welfare.[22]

While none of these approaches are without limitations, they seem to offer a wide range of options that can be used to implement our approach and incorporate risk directly in poverty measurement.

Experimental and evaluation work

Even beyond the construction of a risk inclusive poverty measure, there seems to be a need to better understand the welfare consequences of risk and its impact on heterogeneous groups. As discussed above, we know very little about how uninsured risk exposure affects behavior.[23] Indeed, at the heart of the problem is one of *reverse causality*: the ex-post variability in outcomes that we may observe will be the result of actions taken by a household to *avoid* all risks, including those that we did not observe. As such, observed shocks alone cannot be taken as a proxy of the ex-ante uncertainty to which the response was made. That is, by observing outcomes it is impossible to assess the risks that people have *eliminated* by choosing their actions or risks that people did no action but did not materialize as shocks.[24] At best we can assess what people did for risks that we observe ex-post (as realized shocks).

In this sense, programs that promote **guaranteed payout schemes** could help us better understand how behavior changes with increased security (and hence lower poverty). The idea behind such intervention is that beneficiaries know ex ante that they will receive a specific support (the payout) if a particular risk they are exposed (but cannot insure against) materializes into a shock. This does not only involve market based insurance schemes but rather

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by an identification problem similar to that of not separating ex-ante risk exposure from the ex-post outcome of shocks.

[21] For example see de Weerdt (2004).

[22] Lockshin et al (2003), Ravallion (2002).

[23] Existing examples are Rosenzweig and Binswanger (1993) and Dercon (1996).

[24] Morduch (1990)

any intervention that can guarantee a payout if a shock occurs. Existing ongoing pilots using experimental evaluation designs like providing rainfall insurance, income diversification or guaranteed employment schemes are indeed exciting new directions to better understand behavior under risk and the impact of improved security.

VI. CONCLUDING REMARKS

A general agreement seems to exist that exposure to risk is an integral element of poverty and that it is inherently a forward looking concept. A short review of the currently available methods for measuring vulnerability to risk has revealed some conceptual and practical limitations to address uninsured risk as a direct element of poverty. We propose that one way of addressing the problem of directly including risk into poverty analysis is to calculate poverty indicators based on consumption gaps measured against a benchmark which includes an estimate of the cost of insuring against the risks which are considered socially unacceptable. Such a proposal is consistent with a view of poverty which considers *security* an essential element of the wellbeing of households and individuals. In this sense, *to be vulnerable* becomes synonymous of being *poor*.

While the practical implications of such an approach raise a number of serious challenges, we discuss some directions for future work to address them. These include new areas of integrating aggregate measures of risk beyond the household level in the poverty measure, improved data collection and new pilots to explore ex ante behavior under uncertainty. Such directions are needed in order to truly integrate risk exposure in poverty analysis. A companion paper will subsequently develop an empirical application of this approach to further explore its operational implications.

REFERENCES

Alwang, J., P. Siegel and S. Jorgensen (2001), "Vulnerability: a View from Different Disciplines", Social Protection Unit, Human Development Network, World Bank, May 2001.

Arrow, K. (1965), "*Aspects of the Theory of Risk-Bearing*, Yrjö Jahnsson Lectures, Helsinki.

Barrett, C.B. and M. Carter (2004), "The Economics of Poverty Traps and Persistent Poverty: An Asset-based Approach", Cornell University, mimeo.

Calvo, C. and S.Dercon (2005), "Measuring Individual Vulnerability" Department of Economics Working Paper Series, no.229, Oxford University.

Chaudhuri, S., J. Jalan, and A. Suryahadi (2002), "Assessing Household Vulnerability to Poverty from Cross-sectional Data: A Methodology and Estimates from Indonesia", Columbia University, Discussion Paper 0102-52.

Christiaensen, L. and R. Boisvert (2000), "On Measuring Households Food Vulnerability: Case Evidence from Northern Mali", Working Paper, Department of Agricultural, Resource and Managerial Economics, WP 2000–05, March.

De Weerdt, J. (2005), "Measuring Risk Perceptions: Why and How" Social Protection Discussion Paper 0533, The World Bank, Washington D.C.

Dercon, S. (1996), "Risk, Crop Choice and Savings: Evidence from Tanzania", *Economic Development and Cultural Change*, Vol.44, No.3, 385–514.

Dercon, S. (2004), *Insurance against Poverty*, Oxford: Oxford University Press.

Dercon, S. (2004), "Growth and Shocks: Evidence from Rural Ethiopia". *Journal of Development Economics* 74(2): 309-329.

Dercon, S. (2005), *Vulnerability: a micro perspective*, paper presented at the ABCDE for Europe. Amsterdam, The World Bank.

Fagioli, Massimo (1971) *Istinto di morte e conoscenza*. Nuove Edizioni Romane, Rome, Italy, 2005[11]

Foster, J., J. Greer, and E. Thorbecke (1984), "A Class of Decomposable Poverty Measures", *Econometrica*, 52(3), 761-766.

Gunning, J. and C. Elbers (2003), "Vulnerability in a Stochastic Dynamic Model" Tinbergen Institute Discussion Paper TI 2003-070/2.

Holzmann, R. (2003). “Risk and Vulnerability: The forward looking Role of Social Protection in a Globalizing World”, in: E. Dowler and P. Mosely (eds.): Poverty and Social Exclusion in North and South, London and New York (Routledge).

Hoddinott, J. and A. Quisumbing (2003). “Methods for Microeconometric Risk and Vulnerability Assessments”. Social Protection Discussion Paper 0323, The World Bank, Washington D.C.

Hoogeveen, J., E. Tesliuc, R. Vakis with S. Dercon (2005). “Guide to the Analysis of Risk, Vulnerability and Vulnerable Groups.” Mimeo. Social Protection Unit, The World Bank, Washington D.C.

Jalan, J. and M. Ravallion (2000), “Is Transient Poverty Different? Evidence from Rural China”, *Journal of Development Studies*, Vol.36, No.6.

Kamanou, G., and J. Morduch (2004), “Measuring Vulnerability to Poverty”, chapter in Dercon, S. (ed.), *Insurance against Poverty*, Oxford University Press.

Elbers, Chris, Jean O. Lanjouw and Peter Lanjouw (2002). "Micro-Level Estimation of Poverty and Inequality." *Econometrica* 71:1, pages 355-364.

Ligon, E. and L.Schechter (2004), “Evaluating different approaches to estimating vulnerability”, Social Protection Discussion Paper 0210, The World Bank, Washington D.C.

Ligon, E. and L. Schechter (2003). “Measuring Vulnerability” *Economic Journal* 113 (March): C95-C102.

Michael Lokshin, Nithin Umapathi and Stefano Paternostro (2004). “Robustness of Subjective Welfare Analysis in a Poor Developing Country: Madagascar 2001”, World Bank Policy Research Working Paper 3191, Washington D.C.

Manski, C. (2004), “Measuring Expectations”, *Econometrica*, Vol. 72, No. 5, pp. 1329-1376.

Morduch, J. (1990), “Risk, Production and Saving: Theory and Evidence from Indian Households”, Harvard University, Manuscript.

Morduch, J. (1999), “Between the State and the Market: Can Informal Insurance Patch the Safety Net?” *World Bank Research Observer*, Vol.14, No.2 (August), 187–207.

Pritchett, L., A. Suryahadi and S. Sumarto (2000) “Quantifying Vulnerability to Poverty: A Proposed measure, Applied to Indonesia” Policy Research Working Paper no. 2437. The World Bank: Washington DC.

Ravallion, M. (1988), “Expected Poverty under Risk-Induced Welfare Variability”, *The Economic Journal*, 98(393), 1171-1182.

Ravallion, M. (1993), “Poverty Comparisons”, Chur, Switzerland: Harwood Academic Press.

Ravallion, M., (1998) “Poverty Lines in Theory and Practice,” LSMS Working Paper #133, The World Bank, Washington, D.C.

Ravallion, M. and Lokshin, M. (2001) “Identifying Welfare Effects Using Subjective Questions,” *Economica* Vol. 68(271): 335-57

Rosenzweig M. and H. Binswanger (1993) “Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments” *Economic Journal* 103: 56-78.

Sen, A. (1981), *Poverty and Famines. An Essay on Entitlement and Deprivation*, Oxford, Oxford University Press.

Sen, A. (2000), *Development as Freedom*, Oxford: Clarendon Press.

Townsend, R. (1995), “Consumption Insurance: An Evaluation of Risk-Bearing Systems in LowIncome Countries”, *Journal of Economic Perspectives* vol.9(3): 83-102.

Ventura, Andrea (1998) “Feticismo e religione nell’economia politica”. *Il Sogno della Farfalla*, n. 3/98

World Bank, (2001), *World Development Report 2000/2001. Attacking Poverty*, New York, Oxford University Press.

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Summary Findings

In the recent past, growing attention has been devoted to the attempt to correctly include considerations of exposure to risk in the discussions on poverty reduction and, more generally, economic and social development. The purpose of this article is to take stock of all these efforts and to reconsider the relationship between poverty and exposure to risk. We present a short review of current practices of vulnerability measurement to discuss how none of them is truly consistent with an ex-ante view of assessing the true consequences of risk exposure. We argue that one way of addressing this inconsistency is by adding an estimate of the insurance cost needed to guarantee a socially accepted minimum level of welfare to the level of consumption expenditure taken as a benchmark to identify the poor. In other words, we define an augmented poverty line where the traditional absolute poverty benchmark level is marked up by the estimated cost of insuring against what are considered socially unacceptable risks. We then discuss the practical implications for implementing such a measure and future research directions.

HUMAN DEVELOPMENT NETWORK