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**The Prospects of the Poor:
A Set of Poverty Measures Based
on the Probability of Remaining
Poor (or Not) in Indonesia**

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The Prospects of the Poor: A Set of Poverty Measures Based on the Probability of Remaining Poor (or Not) in Indonesia

Abstract: This paper proposes and operationalizes an approach to measuring poverty based on the probability of remaining poor or not. The paper does the following: we review the global and Indonesia literature on poverty dynamics; we propose a set of poverty lines based on the prospects for the poor using the Indonesian Family Life Survey for 2000–2007; we discuss determinants of poverty at the various poverty lines and consider the poverty probability trends in Indonesia for the period 2000–2013 using the national socio-economic survey, the Susenas.

1. INTRODUCTION

Various scholars have discussed the concept of poverty dynamics in Indonesia since the seminal work of Pritchett et al. (2000). Indeed, with reference to Indonesia there is a particularly rich history of researching poverty dynamics from the longitudinal survey, the Indonesian Family Life Survey (IFLS) that has noted large movements in and out of poverty by various poverty lines.

The objective of this paper is to consider for Indonesia what poverty lines would need to be to capture better those who are near certain to remain poor, the chronic poor, those who are near certain not to remain poor, and those who have a 50/50 chance of poverty in the next time period. The paper utilises the approach of López-Calva and Ortiz-Juarez (2011) who demonstrate in Latin America (Mexico, Brazil and Chile) that there is a point where vulnerability to poverty falls to very low levels and argue that the ‘middle class’ are those with a low probability of experiencing poverty.¹ In doing so, we discuss the determinants of poverty at the various poverty lines using the IFLS and consider poverty probability trends in Indonesia for the period 2000–2013 using the national socio-economic survey, the Susenas.

This paper is structured as follows: Section 2 reviews the global and Indonesia literature on poverty dynamics. Section 3 discusses the IFLS and our methodological approach. Section 4 proposes a set of poverty lines based on the prospects of remaining poor (using a 10% chance, 50% chance and a 90% chance of remaining poor) and discusses the determinants of poverty and then tracks these 10%, 50% and

¹ See later discussion. They find that the risk of falling into US\$4–US\$5 poverty was as low as approximately 10% at an initial income of US\$8–US\$10/day per capita in all three countries but fell to zero in Chile and Mexico at an initial income close to US\$20/day.

90% 'prospects for the poor' poverty lines in Indonesia for the period 2000–2013 using the national socio-economic survey, the Susenas. Section 5 concludes.

2. POVERTY DYNAMICS: A BRIEF REVIEW

2a. The global literature

Vulnerability as a focus of poverty-related research became increasingly prominent within development studies during the 1990s, particularly since the publication of several seminal works, including Chambers (1989), Dercon (2006), Moser (1998) and Sen (1981, 1999) and the 1994 Human Development Report (UNDP 1994).²

In countries for which there are data, it has been estimated that the percentage of the poor that are always poor is typically just 20–30% of poor households (Dercon and Shapiro 2007). This implies that around two-thirds or more of the poor move in and out of poverty, depending on vulnerability and capacities to cope. There is an implication that policy interventions should distinguish between the chronic poor and the transient poor (Baulch and McCulloch 1998; Hulme et al. 2001). With chronic poverty the focus should be on expanding assets and ensuring free-at-point-of-delivery public services. In contrast, transient poverty policy responses are about reducing risks and fluctuations, for example by introducing safety nets and insurance schemes (McCulloch and Baulch 2000).

In the Indonesia context, for example, as Dartanto and Nurkholis, (2013, p. 62) note chronic poverty programmes might be said to include educational subsidies (*Bantuan Operasional Sekolah*), scholarships, conditional cash transfers, community

²Dercon (2006) for example, developed a framework for analysing poverty and vulnerability that was composed of three levels of assets, income generated from those assets and capabilities, noting transitions from one level to the next involve different risks.

empowerment programmes (*Program Nasional Pemberdayaan Masyarakat*), credits to small and medium-sized enterprises (SMEs) microfinance, and infrastructure projects (*Program Pengembangan Kecamatan*). In contrast, transient poverty policies include social safety nets – subsidised rice (*Raskin*), cash transfers (*Bantuan Langsung Tunai*) and health insurance targeted to the poor (*Askeskin*).

The literature on longitudinal poverty analysis in developing countries is expanding rapidly³. Conceptually, a common starting point in thinking about poverty in terms of vulnerability is to consider ‘vulnerability’ and conversely, ‘resilience’ in terms of sensitivity to, and capacity to cope with hazards/shocks/stressors, or variability within the development process. Table 1 provides definitions and combinations that point towards the independence of vulnerability and resilience. Combinations of high and low resilience and high and low vulnerability are possible, and examples of each are given. This approach draws on a metaphor developed by Room (2000) and Wood (2003), which emphasises two key dimensions of the vulnerability–resilience nexus. The first, ‘snakes and ladders’, refers to expected and unexpected vulnerability – meaning variability – that can lead to an advance (ladder) or decline (snake) in human wellbeing. Second, ‘buffers and passports’ refer to resilience capacities (buffers) and abilities to take opportunities from the situation faced (passports).

³ See recent edited volumes by Addison et al. (2009) and Baulch (2011), for example.

Table 1 What are vulnerability and resilience?

		Resilience or ‘buffers and passports’ <i>Capacity to cope and/or (even) advance</i>	
		High	Low
Vulnerability or ‘snakes and ladders’ <i>Sensitivity and/or ‘hazard’/‘harm’/ ‘variability’</i>	High	Highly vulnerable but resilient, e.g. an elderly couple living in a flood-prone neighbourhood but with full health and property insurance, supporting social networks and excellent emergency services.	High vulnerability and low resilience, e.g. an isolated rural community dependent on rain-fed agriculture and with few resources following previous rounds of economic or environmental stress and shock; a community beyond the reach of aid, perhaps because of conflict.
	Low	Not vulnerable and with high resilience, e.g. a well-resourced family not exposed to current hazards and with sufficient capacity to enjoy flexibility in resource expenditure (i.e. savings), access to knowledge resources to plan for the future and insurance to cope with unforeseen contingencies and surprises.	Not vulnerable but also not resilient, e.g. a household not exposed to current risk, but one that has not been able or is not willing to invest in protecting the household from uncertainty and future contingencies. Investment in education and insurance and engagement in community governance are not priorities.

Source: Expanded from Sumner and Mallet (2011).

In their review of datasets, Dercon and Shapiro (2007) identify three key factors accounting for an individual’s ability to escape long-run poverty (‘ladders’): changes in economic and social assets; and/or social exclusion and discrimination; and/or location in remote or otherwise disadvantaged areas. Further, they find that an individual’s descent into poverty can also be explained by temporary shocks (‘snakes’), such as: illness and health-related expenses; social and customary expenses on marriage and funerals; high-interest private loans; crop disease; and drought and irrigation failure. Dealing with such temporary shocks often requires strategies (‘buffers’ and possibly ‘passports’ for some) such as the selling off of assets – which may result in greater vulnerability in the longer term (or what Chambers called ‘poverty ratchets’).

Finally, it is worth noting that vulnerability can be viewed as vulnerability to falling below a specific poverty line or falling further below a specific poverty line (see also later discussion). The poor (however defined) may face different kinds of risk exposures, in terms of not only the qualitative and quantitative nature of hazard exposure but also physicality and existing stretched resilience/capacities to cope. For example, as Table 2 shows, the proportion of Mexican households facing shocks in the poorest income quintile (a relative definition of poverty) is higher than that in the richest income quintile.

Table 2 Incidence of shocks by income quintiles, Mexico, 2002–2005 (%of households)

	Exposure to any shock	Loss of crops	Dwelling, crops and livestock
Poorest 20%	29.0	5.7	8.0
Richest 20%	21.5	1.5	3.1

Source: Adapted from López-Calva and Ortiz-Juarez (2011, p.5,6).

2b. Poverty dynamics in Indonesia

There are a range of papers that address these questions with reference to Indonesia, most but not all using the IFLS (see Alisjahbana and Yusuf 2003; Dartanto and Nurkholis 2013; Pakpahan et al. 2009; Pritchett et al. 2000; Strauss et al. 2004; Sumarto et al. 2006; Suryahadi and Sumarto 2003; Widyanti et al. 2009).

As noted, Pritchett et al. provide one of the seminal works for considering vulnerability to poverty in Indonesia, defined as a 50/50 chance (p. 2) of being poor in the next time period using Susenas and 100 Villages Survey data. Pritchett et al., (2000) found in a sample in which the headcount poverty rate is set at 20%, an additional 10–30% of households are 'vulnerable' to poverty. (p.24).

Other studies include that by Suryahadi and Sumarto (2003), who using the Susenas and Village Potential Surveys (PODES) found that vulnerability to poverty

had unambiguously increased from pre-Asian financial crisis (AFC) levels and that those in the agricultural sector were most vulnerable, but that there was little difference between male- and female-headed households.

More recently, Dartanto and Nurkholis (2013) using the 2005 and 2007 Susenas panel found that 28% of households were chronically poor (poor in both periods); 7% of non-poor households were vulnerable to being transient poor and that the determinants of poverty are educational attainment, number of household members, physical assets, employment status, employment sector, health shocks, access to microcredit programmes, and access to electricity.

Studies using the IFLS, such as Grab and Grimm (2007) identified a significant decline in chronic poverty in Indonesia from 1993–1997 to 1997–2000 which was largely due to a large decline in rural poverty. Alisjahbana and Yusuf (2003) find that overall, the chronic poverty incidence lower than transient poverty (p.6) and the main determinants of chronic and transient poverty (p.9) are education level (especially for urban HHs).

The Pakpahan et al. (2009) study of intergenerational poverty transmission found that there was relatively low intergenerational persistence of poverty. But chronically poor children were much more likely to continue to be poor as adults compared to a child who grew up in a household which was not chronically poor (p.7).

Using IFLS 1997 and 2000, Strauss et al. (2004a) find considerable movement of households in and out of poverty: ‘Over half of those in poverty in 1997 are not in 2000 and over half of those in poverty in 2000 were not in 1997’ (p.47) and that living in rural areas and education levels are significant correlates with poverty (p.48): ‘Consistent with what is universally found, we find that education is significantly

correlated with pce [real per capita expenditure] and, thus, of being out of poverty. We also find that higher education is associated with moving out of poverty from 1997 to 2000 and with staying out of poverty in both years. Living in a rural area is a correlate of higher poverty, as in most low-income economies, although interestingly, it is not related to movements into and out of poverty.

3. ESTIMATING THE RELATIONSHIP BETWEEN EXPENDITURE PER PERSON AND PROBABILITY OF REMAINING POOR (OR NOT)

3a. Estimating ‘prospects for the poor’ poverty lines

To estimate vulnerability to poverty for Indonesia we need to start by estimating the expenditure per capita threshold above which households will have a certain probability of being poor in certain periods and remain poor in the following period. For this we need to propose a relationship between that probability and the corresponding expenditure per person.

We adapt the approach of López-Calva and Ortiz-Juarez (2011) which has several stages as follows: first to identify characteristics associated with movements in or out of poverty. Second to construct probabilities of falling into poverty and third, an income level associated with each probability. They note an important caveat that is worth emphasising here: ‘While there is a strong association between income and vulnerability, it remains nevertheless difficult to anchor a threshold solely to vulnerability, since the curves do not suggest structural behavioral changes’ (p.12).

Following López-Calva and Ortiz-Juarez (2011), the first step to estimate the relationship between expenditure per person and the poverty prospects is estimating

the probability an individual i has for being poor in the next period or p_{it} which will be estimated using the following logistic regression:

$$p_{i,t+1} = \text{Prob}(poor_{i,t+1} | \mathbf{X}_{it}) = \frac{1}{1 + e^{-(\alpha_0 + \sum_j \alpha_j x_{jit})}} \quad (4)$$

where $\text{Prob}(poor_{i,t+1} | \mathbf{X}_{it})$ is the probability that household i is identified as always poor in the current and next time period and likely to enter poverty in the second period, given household characteristics \mathbf{X}_{it} including household human capital, demographic, employment characteristics, regional characteristics and so forth. α_j where $j = 0, \dots, m$ is the parameter as estimated with the Maximum Likelihood method. Equation (4) then is used to calculate the predicted probability of being poor in $\hat{p}_{i,t+1}$.

The second step is estimating an equation that relates the expenditure per person to those household characteristics as follows:

$$\ln(y_{it}) = \beta_0 + \sum_j \beta_j x_{jit} + u_{it} \quad (5)$$

where y_{it} is expenditure per person of household i at time t where β_j and $j = 0, \dots, m$ is the estimated parameter and u_{it} is the error term. This equation will be estimated using Ordinary Least Squares (OLS) method. The household characteristics x_{jit} are the same variables used in estimating equation (4). Estimated equation (5) will then be used to estimate the predicted expenditure per person \hat{y}_{it} .

Finally, the last step is estimating the relationship between predicted expenditure per person and predicted probability of being poor. This is where we adapt the López-Calva and Ortiz-Juarez (2011) approach. They use a procedure which divides the predicted probability into several intervals and uses the intervals to

divide the sample into different categories of what we call poverty ‘prospects’. The average value of the household characteristics is calculated for each group. These average values then are used to estimate the predicted expenditures per person for each group using the estimated equation (5). Then these predicted expenditure per person will be matched with the corresponding predicted probability for each of the probability intervals. This procedure is likely to depend on the number of samples for each interval. We may find, for example, only a few observations in the higher end of the interval resulting in too few observations in some groups that the statistical confidence of the estimate is too low. In light of this we opt for the smoother procedure: that is, by estimating the best trend line depicting the functional relationship between predicted probability of being poor in the next period $\hat{p}_{i,t+1}$ and predicted expenditure per person. For example, we can use the following relationship, where the predicted probability of being poor is a decreasing function of income or expenditure per person and asymptotically approaching a certain lower bound.

$$\ln(\hat{p}_{i,t+1}) = \gamma_0 + \gamma_1 \hat{y}_{it} + e_{it} \quad (6)$$

We use two data sources in this paper as follows: we use two waves of data from the longitudinal IFLS survey to estimate the threshold expenditures. We then use data from the national socio-economic survey, the Susenas, to track various measures of poverty prospects using the threshold for the period of 2000–2013.

The IFLS data used in this study is from IFLS wave 3 (2000)⁴ and wave 4 (2007).⁵ IFLS is a longitudinal survey conducted in 1993 (IFLS1), 1997 (IFLS2), 2000 (IFLS3) and 2007 (IFLS4). The sample is representative of about 83% of the

⁴ IFLS3 was a collaborative effort of RAND and the Center for Population and Policy Studies (CPPS) of the University of Gadjah Mada. See Strauss et.al. (2004a; 2004b).

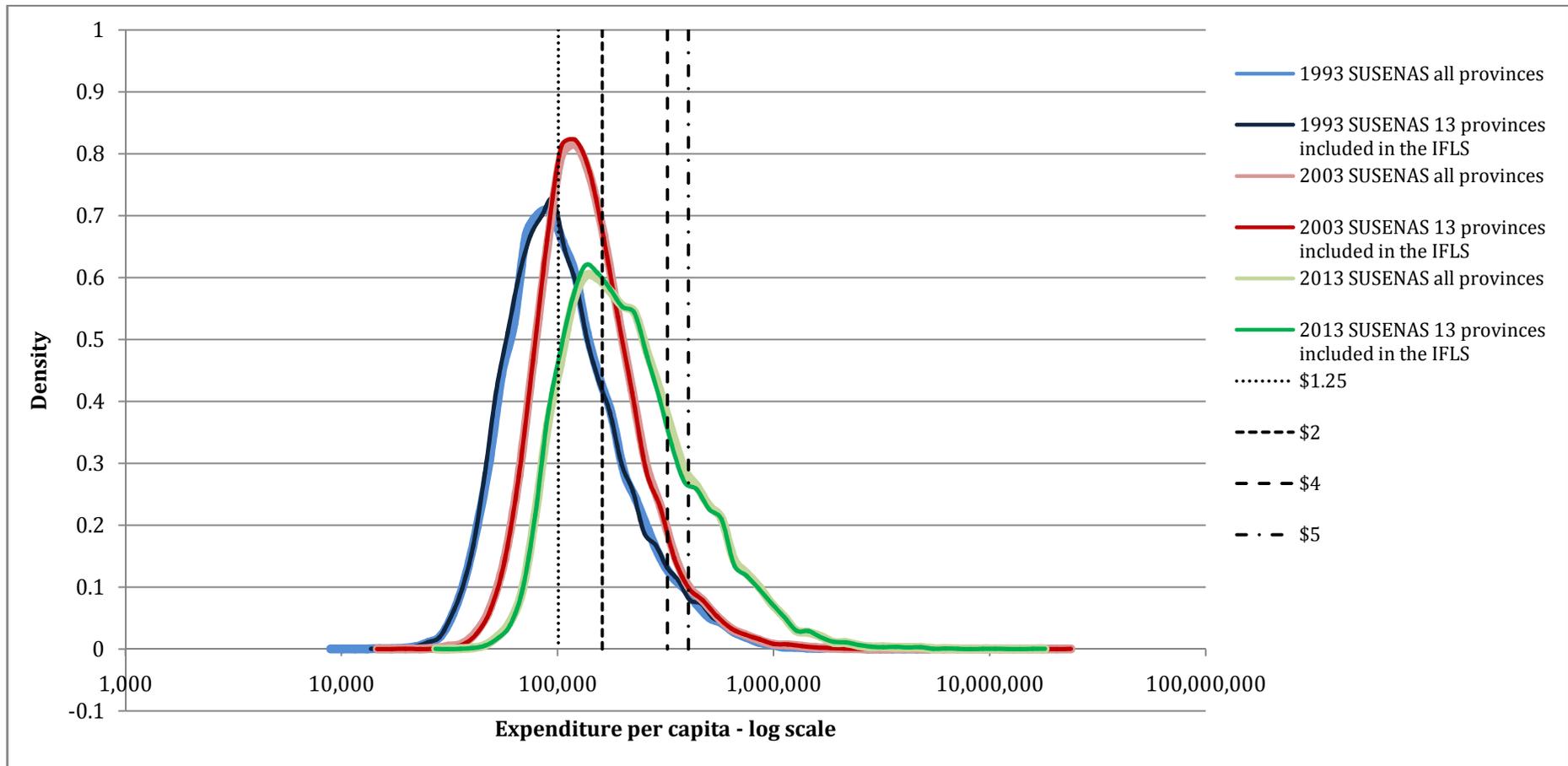
⁵ IFLS4 was conducted by RAND, the center for Population and Policy Studies (CPPS) of the University of Gadjah Mada and Survey METRE. See Strauss et al. (2009).

Indonesian population and contains over 30,000 individuals living in 13 provinces in the country. In the IFLS first wave (IFLS1), 7,224 households were interviewed, and detailed individual-level data were collected from over 22,000 individuals. In its second wave (IFLS2), 94.4% of IFLS1 households were re-contacted (interviewed or had died). In the third wave (IFLS3) the re-contact rate was 95.3% of IFLS1 households. The fourth wave (IFLS4) was fielded in late 2007 and early 2008 on the same IFLS1 households and their split-offs interviewed 13,535 households and 44,103 individuals.

The household survey sample was stratified on provinces and randomly selected within provinces. The sample frame used was based on the 1993 Susenas, a nationally representative socio-economic survey of 60,000 households conducted by the Indonesian Central Bureau of Statistics. Across rounds, interviews were conducted in the national language (*Bahasa Indonesia*); however, interviewers sometimes made use of local languages to facilitate the interview process.

Further, we make use of the national socio-economic survey for Indonesia, the Susenas, which is a series of large-scale multi-purpose socio-economic surveys initiated in 1963–1964. Since 1993, the Susenas surveys cover a nationally representative sample typically composed of around 200,000 households. The Susenas has been conducted every two or three years from 1984 to 1989 and annually since then. Figure 1 shows the distribution of expenditure in the 1993, 2003 and 2013 Susenas in all provinces and in the 13 provinces where IFLS data is collected.

Figure 1 Kernel distribution of expenditure, 1993, 2003 and 2013 (with US\$2005 PPP poverty lines)



Source: Authors' estimations.

Each survey contains a core questionnaire which consists of a household roster listing gender, age, marital status, and educational attainment of household members, supplemented by modules covering about 60,000 households that are rotated over time to collect additional information such as health care and nutrition, household income and expenditure, and labour force activity (Surbakti 1995).

There are two important limitations worth noting: First, that our probability thresholds of 90/50/10 are still arbitrary. Our main defense of these thresholds are that if one has to draw thresholds near certainty (90% and 10%) is not unreasonable as is adding the 50% mid point as per Pritchett et al., (2000). Second, there is, of course, a measurement error on consumption in any survey. This causes us to overestimate how much people's consumption moves up and down and therefore the number of people moving in and out of poverty and associated probabilities. Of course, it is very hard to estimate how much measurement error there is.

4. A NEW SET OF 'PROSPECTS FOR THE POOR' POVERTY LINES

4a. What are the determinants of being poor?

Table 3 is the poverty transition matrix for Indonesia in 2000 and 2007, the year where IFLS data were collected. Here, we define the poor according to national poverty lines for both periods: For 2000, we use IDR91,632 and IDR73,648 for urban and rural households, respectively and for 2007 we use IDR187,942 and IDR146,877 for urban and rural households respectively.

Similar to estimations from existing studies outlined in the previous section,

the table suggests that poverty in Indonesia is dominantly a transient phenomenon. Only about 20% of households defined as poor in 2000 were still poor in 2007. Only 4% of households who were not poor in 2000 became poor in 2007. This illustrates the impact of the fact that a large number of people are very close to the poverty line in Indonesia.

Table 3 Poverty transitions for various poverty lines (distribution of households, % total)

		NPL	1.2*NPL	\$1.25	\$2	\$4	\$5
2000	2007						
Poor	Poor	19.42	28.86	24.26	48.12	79.84	86.54
Non-Poor	Non-Poor	95.61	92.58	94.12	83.58	59.51	54.96
Poor	Non-Poor	80.58	71.14	75.74	51.88	20.16	13.46
Non-Poor	Poor	4.39	7.42	5.88	16.42	40.49	45.04

Source: Authors' estimations.

If one considers further the poverty transitions by various poverty lines, it is worth noting that the NPL, 1.2* NPL, \$1.25 and \$2 poverty lines do not capture the majority of those who are poor in both periods. Any poverty line that fails to capture the majority of people who are poor in both periods may weaken any social assistance targeting particularly those policies which have a time lag to impacts (for example education or health assistance). In this case, one can argue there is case for using a different demarcation line for defining households for the purpose of social assistance targeting. Table 4 shows the results of the estimation of equation (4), the probability of being poor in the current and the following period, and equation (5), the determinants of expenditure in the current period. For equation (4), the dependent variable is a dummy variable assigned the value of 1 if the household is poor in either of the two periods, whereas for equation (5) the dependent variable is expenditure per person in the year 2000. For the equation (4) the dummy variable for the dependent variable is calculated as function of various poverty lines: first, the Badan Pusat

Statistik (BPS) national poverty line and 1.2* national poverty lines.⁶ Second, various international, PPP (2005) poverty lines as follows: US\$1.25/day (the ‘extreme’ poverty line of the World Bank and mean PPP value of the poverty line of the world’s 15 poorest countries; US\$2.00/day (the ‘moderate’ poverty line on the basis that US\$2.36 is the median poverty line of all developing countries) and we add US\$4.00 and US\$5.00 poverty lines to make comparisons with the López-Calva and Ortiz-Juarez (2011) study and because as Ravallion and Chen (2013) notes, US\$4 is the mean poverty line value in East Asia and the Pacific (and thus of relevance to Indonesia) and US\$5 (precisely, US\$4.64) is the mean of all developing country poverty lines.

An estimation is made for each of these various poverty lines in the regression. In general, most of the significant variables have expected signs in the regression. The most robust determinants of the probability of being poor and remaining poor are those that represent capital endowment, namely education and assets ownership. The two variables are significant in every regression but differ according to poverty line used. Other indicators of assets ownership include quality of housing. This is represented by the quality of the floor of a person’s home and access to sanitation. Both variables are significant in most model specifications. Age of the household head is significant but only for the middle range of poverty lines. Gender of the household head does not affect the probability of being poor but it does affect the household expenditure per person.

⁶ BPS (2013, p.47) notes the national poverty lines (NPL) used are: 0.8*NPL = very poor (*sangat miskin*); NPL = poor (*miskin*); 1.2*NPL = near poor (*hampir miskin*) and 1.6*NPL = vulnerable to be poor (*rentan miskin*).

Table 4 Determinants of being poor and expenditure Indonesia: 2000–2007^a

Logistic and linear regression

Model	Logistic	Logistic	Logistic	Logistic	Logistic	Logistic	Linear
Dependent variable	Poverty	Poverty	Poverty	Poverty	Poverty	Poverty	PCE (log-scale)
Poverty line	National	National*1.2	US\$1.25	US\$2	US\$4	US\$5	
Education of the head	-0.238*** (0.047)	-0.203*** (0.035)	-0.208*** (0.039)	-0.177*** (0.023)	-0.189*** (0.024)	-0.208*** (0.028)	0.089*** (0.006)
Age of the head	-0.060*** (0.021)	-0.069*** (0.017)	-0.063*** (0.018)	-0.058*** (0.013)	-0.036** (0.016)	-0.011 (0.018)	0.012*** (0.003)
Age squared of the head	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000* (0.000)	0.000 (0.000)	-0.000*** (0.000)
Sex of the head (1=male)	-0.028 (0.477)	-0.084 (0.355)	-0.199 (0.395)	-0.036 (0.260)	0.181 (0.259)	-0.034 (0.332)	0.132** (0.059)
Head without health insurance	0.703** (0.345)	0.683*** (0.243)	0.590** (0.263)	0.682*** (0.139)	0.447*** (0.102)	0.411*** (0.108)	-0.084*** (0.025)
Unfinished floor	0.427*** (0.132)	0.223** (0.109)	0.206* (0.115)	0.253*** (0.086)	0.446*** (0.126)	0.398** (0.158)	-0.123*** (0.022)
Head married	-0.188 (0.465)	-0.066 (0.355)	-0.008 (0.398)	-0.144 (0.263)	-0.322 (0.268)	0.025 (0.326)	-0.101 (0.062)
Household without sanitation	0.181 (0.115)	0.269*** (0.090)	0.321*** (0.097)	0.223*** (0.064)	0.362*** (0.077)	0.344*** (0.093)	-0.110*** (0.016)
Log of asset per capita	-0.287*** (0.032)	-0.289*** (0.027)	-0.292*** (0.028)	-0.347*** (0.022)	-0.400*** (0.028)	-0.450*** (0.034)	0.155*** (0.005)
Head in agriculture, forestry, fishing and hunting	-0.104 (0.192)	0.048 (0.151)	-0.007 (0.160)	-0.102 (0.109)	-0.067 (0.128)	-0.071 (0.147)	-0.014 (0.027)

Poverty line	National	National*1.2	US\$ 1.25	US\$ 2	US\$ 4	US\$5	Expenditure
Head in mining and quarrying	0.750	0.598	0.545	0.238	-0.817**	-0.438	-0.004
	(0.517)	(0.445)	(0.469)	(0.34)	(0.337)	(0.418)	(0.074)
Head in manufacturing	0.101	0.117	0.064	-0.052	0.091	-0.024	0.018
	(0.230)	(0.184)	(0.196)	(0.13)	(0.145)	(0.165)	(0.031)
Head in electricity, gas and water	-0.139	-0.037	0.138	-1.661**	-0.998*	-1.031**	0.285**
	(0.914)	(0.713)	(0.715)	(0.701)	(0.513)	(0.492)	(0.117)
Head in wholesale, retail, restaurants and hotels	-0.618**	-0.449**	-0.571***	-0.602***	-0.395***	-0.364**	0.174***
	(0.244)	(0.184)	(0.200)	(0.125)	(0.133)	(0.151)	(0.030)
Head in transportation, storage and communications	-0.336	-0.040	-0.000	-0.198	-0.131	-0.034	0.048
	(0.298)	(0.218)	(0.230)	(0.157)	(0.171)	(0.200)	(0.039)
Head in finance, insurance, real estate and business services	0.636	Dropped	0.124	-0.653	-0.443	-0.374	0.193*
	(0.752)		(0.743)	(0.518)	(0.361)	(0.398)	(0.099)
Head in social services	-0.426*	0.640	-0.430**	-0.604***	-0.454***	-0.398***	0.129***
	(0.244)	(0.702)	(0.203)	(0.128)	(0.132)	(0.150)	(0.03)
Sumatra	-0.538***	-0.278	-0.688***	-0.750***	-0.563***	-0.616***	0.080***
	(0.157)	(0.297)	(0.132)	(0.084)	(0.081)	(0.091)	(0.018)
Kalimantan	-0.320	-0.929	-0.717***	-0.792***	-0.516***	-0.697***	0.032
	(0.291)	(0.742)	(0.262)	(0.156)	(0.151)	(0.166)	(0.034)
Sulawesi	-0.044	0.090	-0.237	-0.068	-0.062	-0.155	-0.035
	(0.231)	(0.436)	(0.200)	(0.131)	(0.149)	(0.169)	(0.031)
Household size in 2000	0.128***	0.105**	0.128***	0.138***	0.127***	0.123***	-0.105***
	(0.028)	(0.049)	(0.024)	(0.017)	(0.019)	(0.022)	(0.004)
Occurrence of death	-0.249	0.432	-0.232	-0.078	-0.003	0.106	0.004
	(0.263)	(0.425)	(0.217)	(0.137)	(0.148)	(0.168)	(0.031)

Poverty line	National	National*1.2	US\$ 1.25	US\$ 2	US\$ 4	US\$5	Expenditure
Occurrence of sickness	-0.241	-0.300	-0.127	-0.065	-0.054	-0.050	0.062***
	(0.183)	(0.399)	(0.147)	(0.095)	(0.103)	(0.117)	(0.023)
Occurrence of crop loss	-0.117	-0.383	-0.128	-0.014	0.025	0.097	-0.060***
	(0.162)	(0.354)	(0.135)	(0.09)	(0.105)	(0.124)	(0.021)
Occurrence of natural disasters	-0.050	Dropped	-0.036	-0.261	-0.611***	-0.229	0.258***
	(0.469)		(0.378)	(0.225)	(0.229)	(0.257)	(0.06)
Occurrence of loss a job or business failure	0.050	-0.719	-0.164	-0.227	-0.077	-0.000	0.040
	(0.258)	(0.749)	(0.221)	(0.141)	(0.145)	(0.163)	(0.033)
Occurrence of decrease of household income	-0.004	0.579	0.048	0.004	-0.027	0.082	0.039
	(0.250)	(0.420)	(0.207)	(0.135)	(0.138)	(0.159)	(0.031)
Constant	2.604***	0.164	3.282***	5.581***	8.113***	8.993***	6.269***
	(0.837)	(1.633)	(0.712)	(0.499)	(0.586)	(0.677)	(0.115)
Number of observations	6,355	6,211	6,355	6,355	6,355	6,355	6,355
Pseudo R2 (or R2)	0.099	0.110	0.104	0.133	0.152	0.158	0.398

Source: Authors' estimations. Notes: ^a Dependent variables are the poverty status of households in logistic model, and the household per capita expenditure (log-scale) in linear model. Robust standard error in parentheses: *** p<0.01, ** p<0.05, * p<0.1.

Surprisingly perhaps, the household head's sector of employment is not found to be a robust determinant of the prospect of poverty unless they are employed in the wholesale, retail, restaurants and hotels sectors. This category is significant in five of the seven specifications and also significant in the expenditure equation. Being employed in these sectors is associated with higher expenditure per person and lower probability of being poor. To some extent, the location of the household (which attempts to capture regional variation not represented by other variables) is significantly associated with the prospect of poverty. Java Island is used as the base comparison. And it is found that locations in Sumatera and Kalimantan, for example, are actually associated with a lower probability of being poor compared to those living on Java. Java Island has been traditionally the epicentre of Indonesian economic growth. However, in recent years some provinces in Sumatera and Kalimantan have experienced a resource boom in the oil and palm oil sectors and their rate of poverty incidence has improved at a faster rate than Java.

4b. 'Prospects for the poor' poverty lines

As we have noted, typically, poverty lines are set and remain 'fixed' in the sense a person is either 'poor' (below the line) or 'not poor' (above the line). What such lines do not capture is that person's prospects of remaining poor (or not). What if one could set lines where there was a 90% chance of those under that poverty line remaining poor? Then those groups could be the subject of specific public policies to assist asset accumulation and opportunities. Similarly, if one took any given poverty line, how much higher would one have to measure to capture all those people likely to move in and out of poverty over time? In short, who is likely to be transient poor? And

againone might tailor specific public policies to assist those groups against shocks or stressors that might push them back into poverty. One could also ask where those people live who are chronic or transient poor.

When López-Calva and Ortiz-Juarez (2011) explored a vulnerability definition of the ‘middle class’and considered the daily expenditure necessary to have a very low probability of falling back below the national poverty lines of Mexico, Brazil and Chile (US\$4–US\$5/day pc), they were essentially asking the question ‘when does transient poverty or the risk of poverty end?’. In short, a transient poverty line which they found to be at about double the national poverty lines taken in Mexico, Brazil and Chile.

We do something similar with a range of poverty lines in Indonesia which is to estimate the 10%, 50% and 90% probability of remaining poor or ‘prospects for the poor’ poverty lines (see Table). If one refers to the PPP(2005) US\$ values one finds taking the moderate international poverty line of US\$2/day that it is necessary to have expenditures of US\$3.50 to face a probability of just 10% of poverty,while at 1.08 the probability is 90% of future poverty.

Interestingly taking the US\$4 or US\$5 poverty lines as per López-Calva and Ortiz-Juarez (2011), one finds a similar US\$8/day at a US\$4 poverty line and US\$13/day at a US\$5 poverty line is necessary to reduce the probability of poverty to just 10% in Indonesia – somewhat similar to the comparable data for Mexico, Chile and Brazil.

When one considers the Indonesian national poverty line one finds that the risk of poverty falls to 10% at IDR3,944.44/day or US\$1.47/day. During the period of the data the national poverty line was IDR3,054.40/day or US\$1.14/day for urban and IDR2,454.93/day or US\$0.91/day for rural (in 2005 PPP US\$), and IDR2,754.67

or US\$1.03 for combined urban and rural. Interestingly the 10%, 50% and 90% probability of poverty are respectively 143%, 71% and 55% of the value of the national poverty line (3,944.44/2,754.67) in IDR (and in US\$PPP, 143%, 71% and 55%). In short, one could argue that it would be better to use 1.4* and 0.7* or 0.6* NPL(national poverty line) which are related to the probability of poverty in the future than the currently used 1.6* or 1.2* and 0.8*.

Table 5 Threshold expenditures for 0.1, 0.5 and 0.9 probability of poverty by various poverty lines

Poverty line	National poverty line	1.2* National poverty line	US\$1.25/day PPP	US\$2/day PPP	US\$4/day PPP	US\$5/day PPP
Probability	<i>Rupiah</i>					
0.1	3,944.44	5,259.10	4,802.74	9,448.05	22,496.04	35,023.20
0.5	1,961.85	2,516.59	2,320.31	3,970.70	9,449.69	12,775.75
0.9	1,520.16	1,922.69	1,778.94	2,893.17	3,969.44	4,660.33
	<i>US\$PPP</i>					
0.1	1.47	1.96	1.79	3.52	8.37	13.03
0.5	0.73	0.94	0.86	1.48	3.52	4.75
0.9	0.57	0.72	0.66	1.08	1.48	1.73

Source: Authors' estimations.

4c. Poverty in Indonesia by 'prospects for the poor' poverty lines, 2000–2013

In this section we do the following: We apply the 90/50/10% probability of poverty headcounts to the Susenas taking the post-AFC period since 2000. First we consider the national poverty line and the 1.2* national poverty line by trends over time (comparable data for the US\$ PPP2005 lines is provided in Table6). Second, we consider where the three types of poor (the 90/50/10% probability of being future poor) live.

We take the Foster, Greer and Thorbecke (1984) or FGT family of poverty measures that is well established in poverty research.⁷We follow the FGT approach as

⁷Foster, Greer and Thorbecke set out the P_{α} class of poverty indices. P_0 is incidence of poverty (the proportion of population below the poverty line); P_1 is the poverty gap measure (the average shortfall of incomes of the poor from the poverty line) and P_2 is the squared gap measure or a measure of the severity of poverty. Foster et al. (2010) study retrospectively the subsequent literature and

follows: V_0 is the incidence of vulnerability to poverty - the headcount index. The headcount is defined as the proportion of the population living with a 10%/50%/90% per cent probability of being poor in the future period (at whatever poverty line taken overall). V_1 is a vulnerability to poverty gap measure. This is defined as the average shortfall of incomes of those vulnerable to poverty in the future from the 10%/50%/90% probability of not being poor poverty line (based on whatever poverty line taken overall). Finally, V_2 is a severity of vulnerability to poverty measure or squared gap index. This is the weighted sum of poverty gaps (as a proportion of the poverty line taken), where the weights are the proportionate poverty gaps themselves; a poverty gap of, say, 10 percent of the poverty line is given a weight of 10 percent while one of 50 percent is given a weight of 50 percent; this is in contrast with the poverty gap index, where the gaps are weighted equally. Hence, by squaring the poverty gap index, the measure implicitly puts more weight on observations that fall further below the poverty line taken.

As is well known, the poverty headcount by the national poverty line has steadily fallen from 19% to 11% between 2000 and 2013 with a temporary spike in 2006–2007. The 1.2* national poverty line has fallen steadily too, from 33% to 21% (again with a spike in 2006–2007). Arguably, less well known is that those who are 90% likely to be poor in the future were already fairly few in number in 2000 (2% by the national poverty line and 6% by the 1.2* national poverty line) and by 2013 are negligible in number (close to zero by the national poverty line and just 0.5% by the 1.2* national poverty line. In the middle, those at 50% probability of poverty have fallen to fairly low levels too (just 0.5 by the NPL and 2.7% by the 1.2*NPL in 2013).

contributions to measurement, axiomatics and to application. Celidoni (2011) provides an extension of the FGT (with reference to the UK and Italy data), into vulnerability with the expected incidence (defined as the number of states in which a household is expected to be poor), substitutes the aggregate poverty gap for an expected intensity or expected poverty gap and replaces a measure of inequality among the poor with the expected downward variability for household income.

Table 6 Poverty headcounts (P_0) and vulnerability to poverty headcounts (V_0) percentage of population by various poverty lines, 2000–2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>P₀ - Poverty headcount (% popn)</i>														
National poverty line	19.14	18.41	18.20	17.42	16.66	15.97	17.75	16.58	15.42	14.15	13.33	12.49	11.96	11.37
1.2* National poverty line	32.73	31.96	31.13	30.46	28.78	27.01	30.11	26.21	25.52	24.69	22.69	21.81	21.28	20.74
US\$1.25/day PPP per capita	41.27	39.61	31.28	28.00	33.66	31.79	27.09	23.42	25.43	20.72	17.93	14.87	13.06	12.18
US\$2/day PPP per capita	75.27	73.89	65.95	64.68	68.76	63.42	61.41	53.51	56.52	52.92	45.29	41.39	39.75	39.12
US\$4/day PPP per capita	95.54	94.73	91.70	92.52	93.40	89.70	90.09	84.30	87.67	86.24	81.03	77.00	76.23	74.84
US\$5/day PPP per capita	97.56	96.96	95.13	95.77	96.22	93.64	94.12	89.52	92.67	91.66	88.11	84.47	83.63	82.10
<i>V₀ at 90% probability of future poverty</i>														
National poverty line	1.73	1.34	0.74	0.65	1.31	1.47	0.63	0.61	0.61	0.31	0.25	0.15	0.07	0.06
1.2* National poverty line	6.07	5.34	3.31	2.75	4.38	4.77	2.72	2.80	2.85	1.68	1.25	0.83	0.51	0.46
US\$1.25/day PPP per capita	4.10	3.47	2.05	1.78	3.00	3.30	1.74	1.80	1.80	1.00	0.74	0.49	0.27	0.25
US\$2/day PPP per capita	28.97	27.27	20.52	17.56	22.65	21.84	17.30	15.50	16.96	12.74	10.75	8.35	6.97	6.10
US\$4/day PPP per capita	54.93	53.35	44.45	41.38	47.00	43.72	39.61	34.08	36.48	31.65	27.00	23.86	21.76	20.87
US\$5/day PPP per capita	66.79	65.09	56.55	54.44	59.18	54.82	51.60	44.75	47.30	43.03	36.66	32.95	31.32	30.51
<i>V₀ at 50% probability of future poverty</i>														
National poverty line	6.71	5.92	3.71	3.09	4.83	5.19	3.05	3.10	3.16	1.91	1.40	0.98	0.61	0.54
1.2* National poverty line	18.87	17.47	12.22	10.28	14.28	14.11	10.20	9.61	10.19	7.26	5.72	4.35	3.32	2.72
US\$1.25/day PPP per capita	14.00	12.77	8.64	7.16	10.39	10.48	7.11	6.93	7.18	4.93	3.79	2.74	1.98	1.64
US\$2/day PPP per capita	54.95	53.38	44.48	41.41	47.02	43.74	39.63	34.11	36.50	31.67	27.00	23.88	21.78	20.89
US\$4/day PPP per capita	93.75	92.85	89.00	89.73	90.89	86.58	86.82	80.34	83.92	82.07	75.93	71.72	70.80	69.62
US\$5/day PPP per capita	97.18	96.53	94.46	95.18	95.72	92.88	93.32	88.52	91.74	90.61	86.76	82.94	82.18	80.71
<i>V₀ at 10% probability of future poverty</i>														
National poverty line	54.41	52.86	43.97	40.86	46.53	43.27	39.15	33.70	36.04	31.22	26.67	23.52	21.43	20.52
1.2* National poverty line	74.07	72.67	64.60	63.23	67.37	62.16	60.00	52.27	55.09	51.44	43.95	40.06	38.46	37.80
US\$1.25/day PPP per capita	68.65	67.15	58.70	56.72	61.28	56.74	53.75	46.62	49.31	45.19	38.59	34.80	33.15	32.41
US\$2/day PPP per capita	93.74	92.85	89.00	89.73	90.89	86.58	86.82	80.34	83.92	82.06	75.92	71.71	70.79	69.61
US\$4/day PPP per capita	99.47	99.30	98.76	99.01	99.11	98.05	98.49	95.34	98.07	97.70	96.50	94.57	93.99	93.20
US\$5/day PPP per capita	99.86	99.82	99.64	99.72	99.73	99.32	99.58	96.80	99.35	99.27	98.99	98.17	97.81	97.62

Source: Authors' estimations.

Table 7 Indonesia: Vulnerability to poverty gap measure (V₁) and Vulnerability to poverty severity (V₂), 2000–2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>(V₁) - Vulnerability to poverty gap measure (%)</i>														
NPL	3.62	3.37	3.36	3.26	3.18	3.18	3.37	3.33	2.86	2.60	2.38	2.18	2.00	1.83
1.2*NPL	7.34	6.99	6.92	6.69	6.43	6.23	6.78	6.38	5.81	5.40	4.99	4.67	4.43	4.19
US\$1.25	10.22	9.52	6.96	5.98	7.93	7.78	5.87	5.30	5.77	4.26	3.54	2.76	2.26	2.00
US\$2	29.21	28.19	23.36	21.84	24.94	23.42	20.90	17.87	19.44	16.86	14.32	12.54	11.55	11.07
US\$4	59.10	58.09	53.03	52.43	54.95	51.74	50.31	43.71	47.79	45.34	40.51	37.49	36.49	35.74
US\$5	66.64	65.66	61.13	60.81	62.98	59.77	58.72	51.12	56.31	54.13	49.38	46.21	45.25	44.35
<i>(V₂) - Vulnerability to poverty severity (%)</i>														
NPL	1.06	0.95	0.95	0.94	0.95	0.99	0.97	0.99	0.81	0.73	0.65	0.59	0.51	0.46
1.2*NPL	2.40	2.23	2.22	2.16	2.11	2.12	2.22	2.17	1.88	1.72	1.57	1.45	1.33	1.23
US\$1.25	3.58	3.24	2.24	1.89	2.71	2.75	1.87	1.74	1.87	1.29	1.04	0.77	0.59	0.51
US\$2	13.96	13.27	10.45	9.47	11.45	10.94	9.14	7.80	8.64	7.07	5.96	5.03	4.46	4.18
US\$4	39.56	38.63	33.97	32.96	35.62	33.42	31.54	26.26	29.68	27.34	23.87	21.68	20.76	20.22
US\$5	48.12	47.13	42.42	41.63	44.18	41.60	39.96	32.95	37.86	35.55	31.58	29.07	28.13	27.48

Source: Authors' estimations.

At the other end of the spectrum, the 10% likely to be poor have fallen steadily since 2000 but remain one in five of the population by the national poverty line and almost 40% by the 1.2* national poverty line. In short, Indonesia's poverty problem taking the national poverty line or 'near poor' BPS line is that *large numbers of people have a low probability of remaining in poverty* rather than it being that a small number of people have a high probability of remaining in poverty. Although the numbers have fallen, the risk of poverty is still an issue for 20% to 40% of the Indonesia population. Table 7 further presents the vulnerability to poverty gap measure (V_1) and squared vulnerability to poverty gap measure (V_2) for 2000–2013.

However, if one considers higher poverty lines such as the global median of US\$2/day or the US\$4 or US\$5/day PPP as used in Latin America, one finds that substantial proportions of the population remain poor in Latin American terms. For example, even in 2013, according to the Susenas, three-quarters of Indonesians live below US\$4/day PPP and 40% below US\$2/day. Furthermore, 70% of Indonesians have a 50/50 probability of future poverty at US\$4/day.

If we consider the characteristics of those poor by the national poverty and 1.2*NPL we find that there are some important differences by the three probabilities (see Table8). First, one can note that by either the NPL or the 1.2*NPL, those 50% or 90% likely to remain poor are overwhelmingly (90%) rural. Those 50% or 90% likely to remain poor at working in agriculture/forestry/fishing/hunting are most likely to live in Sulawesi or on other islands.

Table 8 The distribution of poverty by probabilities of future poverty, 2013

	National poverty line			1.2* National poverty line		
	Those 10% likely to remain poor	Those 50% likely to remain poor	Those 90% likely to remain poor	Those 10% likely to remain poor	Those 50% likely to remain poor	Those 90% likely to remain poor
Residence						
Urban	24.23	11.79	7.55	28.64	14.89	11.42
Rural	75.77	88.21	92.45	71.36	85.11	88.58
Education						
Incomplete primary	29.92	38.87	32.07	27.94	34.22	37.31
Complete primary	34.08	25.98	30.19	33.85	29.69	27.92
Other	36.00	35.15	37.74	38.21	36.09	34.77
Employment						
Head in agri./forestry/fishing/hunting	61.30	73.14	73.58	56.47	69.76	74.37
Other	38.70	26.86	26.42	43.53	30.24	25.63
Island						
Java	19.75	4.15	1.89	23.92	11.19	3.30
Sumatra	36.33	24.24	13.21	36.10	29.69	24.11
Kalimantan	4.48	1.75	1.88	6.04	2.65	1.02
Sulawesi	18.36	37.33	47.17	15.54	26.91	38.58
Other	21.08	32.53	35.85	18.40	29.56	32.99

Poverty lines based on probabilities of remaining poor might be useful not only for measuring and tracking poverty in Indonesia but also for thinking about public policy interventions and the further extension of education and asset building type policies to address poverty prospects. Take for example policy targeting: The 14 criteria used by BPS to define beneficiaries of cash transfer programmes in 2005, 2008 and 2013 was based on 14 criteria.⁸ It may be that this list can be reduced to the three variables we found to be significant in every regression: education and asset ownership - quality of floor and access to sanitation. Further those variable not found to be significant (such as household head's sector of employment) might be discounted.

⁸ Size of house; flooring material of house; material used for walls of house; sanitary facilities in house; source of drinking water; source of main lighting; type of fuel used for daily cooking; source of main lighting; how many times a week the family buy meat/chicken/milk how many times per day the family eat how many new clothes the family buy for majority of members per year; financial ability to go to clinic (puskesmas) if sick; main job of head of family and possession of specified assets worth over 500,000 rupiah (savings, gold, colourTV and livestock).

5. CONCLUSION

This paper has proposed a new family of vulnerability to poverty measures, the first of which is a vulnerability to poverty headcount measure with a set of poverty lines based on the prospects for the poor using the Indonesian Family Life Survey for 2000–2007. We discussed determinants of poverty at the various poverty lines and tracked these poverty lines in Indonesia for the period 2000–2013 using the national socio-economic survey, the Susenas. Finally, we asked where the poor live in Indonesia at 10%, 50% and 90% probability of future poverty at the national poverty line and the 1.2* national poverty line.

The paper thus responds to a set of questions as follows: first, what are the determinants of poverty in the case of Indonesia? The most robust determinants of the probability of being poor and remaining poor are those that represent capital endowment, namely education and assets ownership.

Second, if one defines security from poverty as a 10% chance of being poor in the future period, is the US\$10 ‘middle class security from poverty’ poverty line of López-Calva and Ortiz-Juarez reasonable in the case of Indonesia? There appears to be a crude rule of thumb for transient poverty, certainly at poverty lines of US\$2, US\$4 and US\$5 PPP/day which is that one has to double the poverty line to get to a security line of US\$4, US\$8 or US\$13 respectively.

Third, taking the 10%, 50% and 90% chance of being poor in the future, what patterns do we see in Indonesia’s poverty trends using the national poverty line since the Asian financial crisis? And where do the 10%, 50% and 90% likely to be poor (national poverty line) in the future currently live in Indonesia? We find that those who are 90% likely to be poor in the future were already fairly few in number in 2000 and by 2013 are negligible in number. The 10% likely to be poor have fallen steadily

since 2000 but remain one in five of the population by the national poverty line and almost 40% by the 1.2* national poverty line. In short, Indonesia's poverty problem taking the national poverty line or 'near poor' poverty line is that very large numbers of people have a low probability of remaining under the national poverty line. However, if one takes a US\$2/day or the US\$4 or US\$5/day (2005 PPP) one finds substantial proportions of the population remain poor in East Asian terms (given the average poverty line for East Asia is US\$5/day). Even in 2013, according to the Susenas, three-quarters of Indonesians live below US\$4/day PPP and 40% below US\$2/day. Furthermore, 70% of Indonesians have a 50/50 probability of future poverty at US\$4/day. One can also note that by either the NPL or the 1.2*NPL, those 50% or 90% likely to remain poor are overwhelmingly (90%) rural and likely to be working in agriculture/forestry/fishing/hunting and most likely to live in Sulawesi or on other islands. Finally, rather than other multiples of the national poverty line we think 1.4* and 0.7*national poverty lines would be more appropriate because this is the value at which the probability of future poverty is respectively 10% and 50% in Indonesia.

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