

Child Poverty in Vietnam: Providing Insights Using a Country-Specific and Multidimensional Model

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Abstract Despite a wide under-prioritization, the issue of child poverty has received increasing attention worldwide over the last decade. The acknowledgement in Vietnam that child-specific poverty measurement is crucial for poverty efforts directed towards children, and the current lack thereof, instigated the development of a Vietnam child poverty approach. This paper proposes a country-specific, multidimensional and outcome-based approach for the measurement of the incidence, depth and severity of child poverty. It does so at the level of the individual child using household survey data. The development of such an approach at the level of the individual child presents an appropriate alternative for or supplement to the widely used monetary poverty approach, allowing for the use of compatible analytical methods. Findings suggest that 37% of all children in Vietnam live in poverty, with the most pressing areas of deprivation being water, sanitation and leisure. We do not find evidence for a gender bias but do observe a large urban–rural divide, regional disparities and large ethnic inequalities. We argue that this tailor-made approach is a valuable new tool for policy makers and analysts in Vietnam as it enables identification and analysis of poor children, their characteristics and most pressing areas of deprivation within the country’s specific social and cultural context.

Keywords Poverty measurement · Multidimensional poverty · Vietnam

1 Introduction

The need for a child focused perspective in the development and poverty reduction process has been widely recognized over the last decade (e.g., Gordon et al. 2003a, b; Minujin et al. 2005). Several reasons can be put forward for the importance of such a child-focused approach towards poverty (see e.g., Boyden 2006; Gordon et al. 2003a, b; Minujin et al. 2005; Waddington 2004). High dependency on the direct environment for the distribution of basic needs puts children at a higher risk of poverty and makes their

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situation less transparent (e.g., White et al. 2003). Further, poverty often manifests itself as a vicious circle, causing children to be trapped in poverty from birth onwards (e.g., Corak 2006a). Moreover, children have different basic needs than adults do (e.g., Waddington 2004) and childhood deprivation can have life-long adversary effects (Duncan and Brooks-Gunn 1997). Child-focused poverty approaches are crucial to account for these issues and provide detailed information at the level of the individual child. A generally accepted definition and measurement method of child poverty is an important tool for both academics and policy makers. It does not merely offer the opportunity to get an insight into the poverty status of children but also provides the possibility to formulate and monitor sound poverty reduction objectives, strategies and policies (e.g., Ben-Arieh 2000; Corak 2006a, b).

The country of Vietnam has experienced a period of outstanding rapid economic growth, after the Doi Moi (renovation) reform policies that came into place in the late 1980's. Central planning made way for free-market oriented economic policies, bringing about great changes in the agricultural sector, private business and employment development, foreign trade and social sector policies. The reforms proved to be greatly beneficial for Vietnam's economic performance, with average economic growth rates of 6.9% from 1988 to 1994 and 7.4% from 1994 to 2000 (Glewwe 2004). Furthermore, monetary poverty was also reduced notably; from 58% in 1993 to 19.5% in 2004 (VASS 2006). The demographic decomposition of these poverty figures in terms of region, gender and ethnicity are widely available and studies of specific groups well-documented (see e.g., Baulch et al. 2007; Minot 2000; Minot and Baulch 2004; Nguyen et al. 2007). Analysis of various age groups, however, is less common and as a consequence little is known about children and their situation in Vietnam. Until now, there have not been any comprehensive poverty analyses in Vietnam for children, presenting a knowledge gap for policy makers and analysts in their efforts to design, implement and evaluate policies directed towards children.

This paper presents a tailor-made approach for measuring child poverty in Vietnam and analyzes its empirical outcomes on the basis of data from the 2006 Multiple Indicator Cluster Survey (MICS). The remainder of this paper is structured as follows: firstly, the conceptual framework is discussed. Secondly, the processes of identification and aggregation are described, leading to the set of domains and indicators. Thirdly, the data is outlined. The conceptual framework is then extended to a practical application and findings for multidimensional child poverty incidence, depth and severity are presented and discussed. Finally, we draw conclusions about the value and use of the proposed approach.

2 Conceptual Framework

Different scholars have emphasized the importance of having a clear understanding of the underlying rationale and concept of a poverty approach to be able to adequately and appropriately use it (e.g., Ravallion 1994; Roelen et al. 2009; Ruggeri Laderchi et al. 2003; Vandivere and McPhee 2008) and the lack thereof in many poverty debates (Noble et al. 2006). Avoiding this fallacy, we firstly outline the conceptual framework of our child poverty approach before turning to other definitional and methodological choices inherent to the development of a (child) poverty approach.

The approach's conceptual framework is a result of extensive discussions and deliberations with policymakers (including line ministries, UN agencies and other international

organizations.¹) and a careful assessment of current advances in child poverty measurement. A first step in the conceptual framework is to consider a monetary versus multidimensional focus, a division that is commonly made within the area of poverty measurement. While monetary definitions refer to the measurement of poverty on the basis of income or expenditures, multidimensional measurement incorporate a larger range of attributes that are assumed to reflect the state of poverty. Money-metric poverty measurement was and remains the most widely used method for poverty analysis world-wide (Redmond 2008; Ruggeri Laderchi et al. 2003), based on the rationale that individuals with a certain degree of purchasing power are able to fulfill their basic needs (Thorbecke 2008; Tsui 2002). However, an increasing number of scholars reject the conceptual notion that monetary measures adequately reflect the state of human development (Wagle 2009). Moreover, there are a number of drawbacks of the monetary approach, also in terms of child poverty measurement. Its underlying rationale assumes that all attributes for the fulfillment of basic needs can be purchased on markets and expressed in monetary terms. However, in many instances those markets do not exist or function imperfectly (Thorbecke 2008; Bourguignon and Chakravarty 2003; Tsui 2002) and monetary values can not be assigned to specific attributes.² (Thorbecke 2008; Hulme and McKay 2008). Further, when individuals or households have sufficient income for the purchase of a basic basket of goods, it does not directly imply that it is also spent on this basket of goods (Thorbecke 2008). Also, income is predominantly measured at the household level, not capturing intra-household distribution (Hulme and McKay 2008). Finally, children are not economic agents and therefore not able to generate income to sustain their own livelihood, making monetary indicators inadequate tools for capturing child poverty (White et al. 2003). Against the backdrop of these conceptual and technical drawbacks of the money-metric poverty approach, we deem it more suitable to develop a multidimensional approach for the measurement of child poverty in Vietnam, including other aspects than income that are considered to more adequately reflect the state of poverty.

A second consideration within the approach's conceptual framework concerns opportunity versus outcome-based measurement. Amartya Sen's work (1976, 1979) on the capability approach was groundbreaking for the topic of multidimensional poverty measurement, focusing on individuals' capabilities to reach an improved standard of living that is not merely reflected by income. Capabilities can also be referred to as a "... persons freedom to promote or achieve valuable functionings" (Alkire 2008). In other words, the capabilities approach can thus be classified as an opportunity-based theory as opposed to an outcome-based one (Robeyns 2003) or ex-ante rather than ex-post method (Thorbecke 2008). We choose to focus on an outcome-based rather than opportunity-based approach for two reasons. Firstly, capabilities and opportunities are very hard to define and observe, making it difficult to operationalize Sen's approach (Alkire 2008). Secondly, children might not have the power to fully utilize their set of capabilities. They are dependent on their direct environment, including parents, family and community, to turn capabilities into positive outcomes. Therefore, it is preferable to focus on outcomes to learn about children's actual state of living (Thorbecke 2008).

Furthermore, the approach presented here is child-specific, measuring child poverty at the level of the individual child. Focusing on the individual child as unit of analysis ensures

¹ The first identification of the rationale and purpose of the child poverty approach in Vietnam was primarily the result of extensive discussions and interviews with UNICEF Vietnam and the Ministry of Labor, Invalids and Social Affairs (MOLISA) in Vietnam.

² Consider attributes such as literacy, numeracy, life expectancy, social participation and information.

that the actual situation of that child is considered and there is no need for assumptions about the distribution of resources within the household (White et al. 2003). The importance of a child-centric analysis with respect to poverty is also emphasized within the deprivation approach (Gordon et al. 2003a, b) and a model of child poverty for South Africa (Noble et al. 2006).

Finally, the proposed approach is tailored to fit the social and cultural context of Vietnam, including issues that are deemed to adequately reflect child poverty. Along the lines of the consistency versus specificity trade-off (Thorbecke 2008), we have chosen to be specific at the national level to enable consistent intra-country comparisons. Employing a country-specific approach also provides the opportunity to incorporate country-specific thoughts and processes on child well-being such as the Law on the Protection, Care and Education of Children (Socialist Republic of Vietnam 2004) and ensures the usefulness of this approach for its intended purposes, namely policy advocacy, design and evaluation in Vietnam.

3 Identification and Aggregation

On the basis of these premises, a number of choices have to be made in the actual construction of the child poverty approach. Sen (1976) referred to a two-step process in poverty measurement, namely identification and aggregation. Identification can be said to refer to the selection of domains and indicators, thresholds within each domain, weights and the multidimensional poverty line (Alkire and Foster 2008). Aggregation concerns the summary of individual level information to an aggregate statistic.

By definition, a multidimensional approach is comprised of a set of domains, reflecting different aspects that are considered to constitute poverty. Indicators are selected to give a comprehensive representation of the development within the respective domains. An elaborate discussion on the choice of domains and indicators is important as it is subject to value judgments, which should be made as explicit as possible, and should be firmly grounded in the academic and policy arena (Alkire 2008). While some scholars, such as Nussbaum (2000, 1992), suggest the use of a universal list of domains and indicators, others advocate for a context-specific set (Alkire 2008). Sen (1993) proposes that a set of domains or indicators “[...] has to be related to the underlying concerns and values” (Sen 1993, p. 32). Therefore we select domains and indicators that are specific to the situation for children in Vietnam, thereby ensuring its relevance for national analysts and policy makers. Alkire (2008) and Biggeri (2007) identified various methods for the selection of domains for multidimensional poverty measurement purposes. These selection methods include the assessment of available data, expert opinions or assumptions, public consensus, participatory assessments and empirical evidence about people’s values with respect to poverty and well-being (Alkire 2008; Biggeri 2007). All these methods have advantages and disadvantages to its use and alone do not suffice as a valid selection method (Alkire 2008). Robeyns (2006) further describes an ideal-feasible choice process as one of the several procedural criteria in the selection of domains and indicators.

A combination of Alkire (2008) and Biggeri’s (2007) selection methods against the backdrop of Robeyns’ (2006) ideal-feasible process was used for the selection of domains and indicators. Ideal indicators, on the basis of assumptions, expert opinions, public consensus and participatory data, were immediately screened against indicator characteristics that followed from the approach’s conceptual framework. Firstly, the indicators should ideally be child-specific. Nevertheless, it is inevitable to measure certain indicators

related to shelter, water and sanitation at the household level as such data is only available at the household level (Gordon et al. 2003a, b). Secondly, indicators should be easily observable and thereby measurable (Moore et al. 2004), implying that indicators about quality of services, for example, are difficult to include in our list of indicators. Thirdly, indicators should be easily interpretable. To be able to use indicators for the provision of information about a certain aspect of child poverty and to feed into the policy making and monitoring process, they should be easily interpretable in an unambiguous way (Moore et al. 2004). Fourthly, indicators should be factual. Hence, they should measure facts rather than subjective opinions and have the same meaning over time as well as different groups within the overall reference population (Gordon et al. 2003b). Finally, the indicators should adhere to the values and norms of the specific society in order to be meaningful (Thorbecke 2008). In this study, the chosen indicators should fit the Vietnamese context and are as such culture and society-specific.

The method of assumptions and expert opinion inspired a first set of domains and indicators, complemented by those identified on the basis of public consensus. Next, participatory processes were employed to account for the views of stakeholders and key-informants, thereby ensuring the incorporation of the Vietnamese context. A final selection mechanism at work during the identification process for domains was the assessment of existing data and data availability. The ideal list of domains included income, education, health, nutrition, transport, communication, subjective well-being, safety, shelter and water and sanitation, social inclusion and protection. Key-informants interviews, an in-depth assessment of available data and consistency check with the conceptual framework provided a reduced and final feasible list of seven domains and twelve indicators, see Table 1. The income dimension was left out of consideration because it was considered a means to an end rather than an end in itself and did not fit the pre-defined purpose and outcome-based concept of the approach. The issues of communication, safety and transport were not considered dimensions properly reflecting the poverty status of Vietnamese children and did not fit the country's context. The dimension referring to children's nutrition had to be left out of consideration due to data constraints. Lack of data also restricted the inclusion of more indicators with respect to social protection and inclusion.

Table 1 Indicators of the Vietnam child poverty approach

Domain	Indicators
1. Education poverty	% Of children not enrolled at the appropriate level
	% Of children not having completed primary school
2. Health poverty	% Of children not fully immunized
3. Shelter poverty	% Of children living in dwellings without electricity
	% Of children living in dwellings without proper roofing
	% Of children living in dwellings without proper flooring
4. Water and sanitation poverty	% Of children living in dwellings without hygienic sanitation
	% Of children living in dwellings without safe drinking water
5. Child work	% Of children working
6. Leisure poverty	% Of children not having toys
	% Of children not having at least one book
7. Social inclusion and protection poverty	% Of children not having their birth registered

Please refer to Annex 1 for the exact definition of indicators and cut-off points

After having identified the set of domains and indicators, one has to consider the question of how to weigh these different elements in constructing the composite measure (Alkire and Foster 2008). Regardless of the weighting scheme chosen, it is subject to value judgments and remains a debatable issue. Existing (child) poverty approaches have opted for different schemes, some applying equal weighting (e.g., Gordon et al. 2003a, b; Bradshaw et al. 2006; Land et al. 2001) while others have used statistical inference methods such as principal component analysis (e.g., Tanton et al. 2006) or stated preference methods (e.g., Kruijk and Rutte 2007; Watson et al. 2008). The choices for these methods are inspired by practical and feasibility considerations, conceptual motivations and technical reasons. With respect to the child poverty approach in Vietnam, we opt for an equal weighting strategy. Conceptual considerations have not resulted in compelling reasons to assign greater weight to certain domains over others. Moreover, applying factor analysis did not provide results in support of differential weights for different indicators or domains. Finally, Hagerty and Land (2007) argue that the use of an equal-weighting strategy is justified in case stated preferences are unknown.

The multidimensional poverty line of our approach for calculating the poverty headcount is based on a dual cut-off identification strategy (Alkire and Foster 2008) as opposed to other options such as the union and intersection approach (Atkinson 2003). The dual cut-off identification strategy implies that a child is identified as being poor when he/she is vulnerable in at least two domains. In turn, domain poverty is constituted by not meeting the poverty line for at least one of the indicators within that domain. Poverty in at least one domain constitutes poverty in terms of the union approach and poverty in all domains constitutes poverty along the definition of the intersection approach (Atkinson 2003). While the intersection approach is generally considered to be too constricting, excluding too many from the definition of poverty, the union approach is widely thought to be too inclusive and leads to overestimations of poverty (Alkire and Foster 2008). The dual cut-off identification strategy is an alternative measure, which satisfies a number of important properties such as decomposability, symmetry and dimensional monotonicity (Alkire and Foster 2008).³ This type of identification and aggregation of the poor, defining a poverty limit for each attribute and aggregating over attributes per individual rather than aggregating over individuals per attribute, was pioneered by Bourguignon and Chakravarty (2003) and influenced concurrent development of multidimensional (child) poverty approaches (see Gordon et al. 2003a, b; Alkire and Foster 2008).

In addition to the poverty headcount, we also consider the depth and severity of child poverty in terms of a child poverty gap and severity measure. A simple count of deprivations would not suffice for these purposes and provide biased results as not all indicator deprivations are observable for children of all ages.⁴ In response to this issue, we calculate the normalized child poverty gap, dividing the total number of observed deprivations by the maximum number of observable deprivations per individual child. The child poverty

³ The technical notation of the calculation of child poverty figures can be found in Annex 2.

⁴ For example, indicators with respect to education are only collected for children from 5 years and upwards while information with respect to leisure and social inclusion and protection is only available for children below the age of 5 years. A total count of deprivations would thus bias the results in terms of child depth and severity towards children for whom more deprivations are observable. The fact that not all indicators are observable for children of all ages creates difficulties in terms of measurement and direct comparisons but makes sense in conceptual terms. Whilst the observation of child immunization (which is only observed for children 2–4 in the current data) would be meaningful for a 8-year old child, it is not conceptually meaningful to have an observation with respect to education or child labor for a 2-year old child.

gap ratio indicates the average poverty gap of the total population as a percentage of the maximum number of observable deprivations. Child poverty severity is consequently calculated by taking the square value of the normalized poverty gap, thereby assigning greater weight to those children with a larger poverty gap. The calculation of the child poverty depth and severity in this manner is in line with the calculation of the monetary poverty indicators and can be used parallel in a comprehensive poverty analysis. To our knowledge, the only previous attempt to measure the depth and severity of child poverty was undertaken by Delamonica and Minujin (2007). However, rather than focusing on the individual child, they focused on the household as the unit of analysis.

4 Data

The data used for our study is the Multiple Indicator Cluster Survey (MICS) from 2006. The Vietnam MICS is based on the standardized MICS surveys as technically supported by UNICEF. The first and second round was conducted in 1995 and 2000, while the third round was completed in 2006. The survey contains a range of questions especially focused on education, health, accomodation, HIV/AIDS and is separated into a questionnaire for households, women of reproductive age and children under five. Regions were identified as the main sampling domains and the sample was selected in two stages, based on enumeration areas from the census (GSO 2007). The sample consists of a total number of 8,356 households with 36,573 individuals out of which 10,874 are children up to 16 years of age. Household surveys like the MICS provide micro-data at the level of the individual child, allowing for the possibility to derive all deprivations back to the individual child. A number of limitations are also inherent to the use of the MICS. Micro-data from the survey is not collected for all children of all age groups, data on nutrition is not available at the time of writing and the sampling method of the MICS (and other household surveys in Vietnam) causes a substantial group in the society to be omitted from the sample and subsequent data. The sample for the survey is constructed on the basis of the official lists of registered households that have lived in the enumeration area for at least 6 months (Pincus and Sender 2006). This implies that households or individuals that have recently migrated are not included in the sampling frame (Edmonds and Turk 2004). Furthermore, due to the strict household registration system, or *ho khai* system, many households and individuals do not satisfy the necessary criteria to newly register and thus stay unregistered (Pincus and Sender 2006). The omission of this group in society is not only an important issue to point out because of its suspected significant size but even more so because of the denial of social and public services they experience due to their status. The structural exclusion of this group from the data will most likely result in underestimations for child poverty.

5 Child Poverty Incidence, Depth and Severity

In this section, we present empirical outcomes for the child poverty approach at the indicator level as well as aggregate level. Table 2 presents the indicator poverty rates that lie at the heart of the child poverty approach. They indicate the proportions of children not meeting the thresholds for individual indicators as a share of all children for whom the indicators can be observed.

The results suggest that the most pressing areas of poverty are leisure, sanitation and health. Almost two-thirds of children up to age five do not have a children's or picture

Table 2 Indicator poverty rates

Domain	Age groups	Indicator	Indicator poverty rate
Education poverty	$n = 8,167$, age 5–15	Enrollment poverty rate (% children not enrolled)	18.38
	$n = 4,381$, age 11–15	Completion poverty rate (% children not having completed primary school)	9.11
Health poverty	$n = 1,612$, age 2–4	Immunization poverty rate (% children not fully immunized)	31.37
Shelter poverty	$n = 10,874$, age 0–15	Electricity poverty rate (% children in dwellings without electricity)	4.0
		Roofing poverty rate (% children in dwellings without proper roofing)	9.0
		Flooring poverty rate (% children in dwellings without proper flooring)	21.9
Water and sanitation poverty	$n = 10,874$, age 0–15	Sanitation poverty rate (% children in dwellings without hygienic sanitation)	41.1
		Drinking water poverty rate (% children in dwellings without safe drinking water)	12.6
Child work	$n = 7,728$, age 5–14	Child work rate (% children working)	23.7
Leisure poverty	$n = 2,680$, age 0–4	Toy poverty rate (% children not having toys)	29.3
		Book poverty rate (% children not having at least one book)	65.6
Social inclusion and protection poverty		Birth registration poverty rate (% children not having birth registration)	12.4

Source Authors' calculations from MICS 2006

book and 41% of all children live in a dwelling without a hygienic sanitation facility. One out of three children aged 2–4 have not received the full package of vaccinations. The overall poverty incidence for the indicators referring to the availability of toys, child labor and type of flooring in the dwelling that the child resides in is between 20 and 30%. Primary school completion, electricity and proper roofing in the child's dwelling, safe drinking water and birth registration are indicators with the lowest overall poverty rates, ranging from 4 to 13%. Demographic decomposition of these figures suggests large disparities for some groups, which can also differ from indicator to indicator. Across the board, there is no sign of gender inequality. Decomposition by area, however, suggests a large urban–rural divide in Vietnam, especially with respect to the domains of water and sanitation and shelter. Regional results also display considerable differences with respect to indicator poverty rates, with the Red River Delta region conveying lowest levels of indicator poverty incidence and the mountainous regions North West and North East with highest indicator poverty incidence.

The poverty results for the individual indicators are further aggregated along the lines of the dual cut-off identification strategy to arrive at composite poverty indicators, reflecting poverty incidence, depth and severity. These aggregate figures are presented in Table 3.

The use of the Vietnam-specific child poverty approach indicates that 37% of all children are considered to be poor. The average poverty gap is 21% of the maximum number observable indicator deprivations, whilst the poverty severity index amounts to 9.

Table 3 Child poverty incidence, depth and severity

	Child poverty incidence	Child poverty gap	Child poverty severity
Total	36.7	21.2	8.9
<i>Gender</i>			
Male	36.9	21.1	8.9
Female	35.4	21.3	9.0
<i>Area</i>	***	***	***
Urban	12.0	7.3	1.8
Rural	43.4	24.6	10.7
<i>Region</i>	***	***	***
Red River Delta	11.3	8.0	1.6
North East	58.8	31.2	15.7
North West	77.7	40.4	21.8
North Central Coast	30.9	15.9	4.9
South Central Coast	28.8	14.5	4.7
Central Highlands	40.5	21.6	8.9
South East	22.6	11.9	15.7
Mekong River Delta	59.9	27.8	11.7
<i>Ethnicity</i>	***	***	***
Kinh/Chinese	28.3	13.8	4.2
Other	78.1	41.4	21.7
<i>Age group</i>	***	***	***
0–2	51.1	28.9	13.7
3–4	52.0	27.5	12.9
5	28.1	16.9	5.9
6–10	27.3	16.2	5.8
11–14	35.1	20.4	8.7
15	36.1	22.9	9.6

Source Authors' calculations from MICS (2006)

Note *** <0.001, significance level Chi-squared group equality of means

The breakdown of aggregate poverty figures by demographic groups shows that high poverty incidence generally goes hand-in-hand with deeper and more severe poverty. Furthermore, the patterns for child poverty considering different demographic groups are similar to those observed for individual indicators. There is no significant difference in poverty incidence, gap and severity for boys and girls. Poverty incidence is much higher in rural areas than it is in urban areas, amounting to 43% in rural areas compared to 12% in urban areas. Poverty depth is also three times higher in rural areas than urban areas. Regional figures point towards the North West and North East regions as most poverty-stricken regions whilst the Red River Delta and South East regions hold the lowest poverty incidence, gap and severity rates. In the North West region, child poverty is 7 times more prevalent at 78% compared to the Red River Delta region at 11%. These large spatial differences have also been identified in previous studies relating to monetary indicators (see e.g., Minot and Baulch 2004; Minot 2000; Nguyen et al. 2007). In terms of ethnicity, children belonging to ethnic minorities are more prone to poverty and experience deeper and more severe poverty than children belonging to the Kinh/Chinese ethnic majority. Finally, with respect to age groups, we observe high rates of poverty for the youngest children, in age brackets 0–2 and 3–4, and the oldest children of age 15. These results,

however, only present a partial picture as not all indicators are observable for all children and the number of maximum observable indicators might differ for children in different age groups. This bias does not occur when considering the poverty gap and severity ratios, however, as they have been normalized on the basis of the number of maximum observable indicators per child. The figures suggest that poverty depth and severity for children is high for young children, decreases with age until the age of 10 but increases again for children aged 11–15. The differences in the degrees of poverty for children in different age groups might be attributed to the specific indicators relevant for specific age groups.

6 Groups of Child Poverty

An analysis of domain poverty by quintiles on the basis of the poverty gap and severity provides further insights into the poverty characteristics of those different groups. However, the poverty gap ratio and severity index based on the current methodology for multidimensional poverty measurement do not represent a continuous variable but consist of a limited range of values due to the count of indicator deprivations. Therefore, the population cannot be separated into quintiles that represent equal shares of the population. Table 4 presents an approximation of the poverty quintiles, separating the child population in five poverty groups on the basis of their degree of poverty.

Poverty groups 1 and 2 consist of children that are not considered poor. Children in group 1 do not suffer from poverty with respect to any indicator, whilst children in group 2 do suffer a degree of poverty albeit below the poverty line. Groups 3 and 4 include poor and non-poor children whilst group 5 consists solely of poor children. Depth and severity of poverty within these groups increases considerably from group 2 to 5. On average, children in group 2 suffer poverty with respect to 12% of the maximum observable indicators whilst this amounts to 59% for the children in group 5. The poverty severity index confirms that children in the poorest quintile suffer considerably more severe poverty than children in the other quintiles. Table 5 provides further insight into the distribution of poverty over various demographic groups and types of domain poverty suffered by the group of poorest children.

Estimates on the distribution of poverty illustrate the share of poverty of various demographic groups in the poorest quintile. Figures suggest that a greater share of the poor is male than female, which is a reflection of the demographic distribution of gender in Vietnam. The large majority of poorest children live in rural areas in Vietnam, whilst the North East and Mekong River Delta regions together hold two-thirds of all poorest children. Despite the disadvantaged position of ethnic minorities, more than half of the

Table 4 Poverty groups and their degree of poverty

	Proportion of all children	Poverty incidence	Average poverty gap ratio	Average poverty severity index
Total population	100	36.7	41.8	20.4
Poverty group 1	33.0	0	0	0
Poverty group 2	23.8	0	12.3	1.5
Poverty group 3	18.5	39.8	17.9	3.4
Poverty group 4	11.0	87.1	29.9	9.3
Poverty group 5	13.7	100	58.7	36.1

Source Authors' calculations from MICS (2006)

Table 5 Distribution of poverty and domain poverty rates in the poorest quintile

	Share of poverty in poorest quintile
<i>Gender</i>	
Male	53.9
Female	46.1
<i>Area</i>	
Urban	3.9
Rural	96.1
<i>Region</i>	
Red River Delta	0.3
North East	31.5
North West	11.5
North Central Coast	8.6
South Central Coast	4.7
Central Highlands	6.1
South East	4.8
Mekong River Delta	32.5
<i>Ethnicity</i>	
Kinh/Chinese	56.7
Other	43.3
<i>Age group</i>	
0–2	24.1
3–4	17.7
5	2.9
6–10	14.6
11–14	27.6
15	13.1
	Domain poverty rate in poorest quintile
Education poverty	37.5
Health poverty	17.1
Shelter poverty	85.6
Water and Sanitation poverty	97.4
Child work	26.0
Leisure poverty	40.7
Social inclusion poverty	15.7

Source Authors' calculations from MICS 2006

children in the poorest group are of the Kinh/Chinese ethnic majority as this group presents a larger proportion of the overall population. Estimates by domain poverty present the proportion of children in the poorest group suffering poverty in the specific domain. Findings indicate that almost all children in this group suffer from poverty with respect to water and sanitation. Shelter poverty is suffered by almost 9 out of 10 children in this group. Deprivation in other domains is more dispersed with 4 out of 10 children suffering poverty with respect to leisure and education and 1 out of 4 with respect to child work. When interpreting these results, however, one has to keep in mind that indicators in the

shelter and water and sanitation domains are observable for all children in the sample while the health indicator, for example, is only observable for a restrictive age group. This limitation of the data is likely to result in an underestimation of poverty for those indicators and domains that are only observable for a restrictive group of children.

The findings above and its concurrent analysis illustrate that the child poverty approach put forward in this paper can serve as an alternative of or complement to the monetary poverty measurement. The presentation and interpretation is similar and provides a poverty profile for different groups of children in society. However, in contrast to standard money-metric poverty measurement approaches, the multidimensional methodology also allows for a breakdown of poverty by different areas of development or well-being. This allows for a more in-depth poverty analysis that can add value to the academic debate as well as policy process.

7 Conclusion

In this paper, we propose a new approach for measuring child poverty in Vietnam, taking a multidimensional and child-specific perspective. It provides conceptual as well as empirical outcomes that add value to the debate on child poverty measurement in the academic and policy arena. The study's contribution in conceptual terms comprises the development of a multidimensional child poverty approach with an outcome, child-specific and country-specific focus and includes a measurement for poverty incidence, depth and severity. Empirical outcomes include a detailed multidimensional child poverty analysis for Vietnam, providing breakdowns by demographic groups as well as indicator and domain poverty.

Conceptually, this paper explores the development of a country-specific approach to capture child poverty in a multidimensional manner. It illustrates the process of development and the inherent choices and decisions that one has to make to construct a sound and solid approach. Empirical findings highlight a number of relevant issues. Child poverty incidence estimates indicate that every third child in Vietnam is multidimensionally poor. The most pressing areas for children in Vietnam are water and sanitation, leisure and shelter whilst domain poverty is lowest with respect to education. The poverty profile on the basis of demographic decomposition does not display any signs of gender inequality but does point towards a large urban–rural divide and regional disparities in terms of poverty incidence, depth and severity. Infants as well as children in the oldest two age brackets are found to experience the deepest and most severe poverty. An analysis of the poorest 20% of all children suggests that the large majority of these children live in rural areas and, more specifically, in the Northern mountainous regions and that they are extremely vulnerable with respect to water and sanitation and shelter.

On the basis of the paper's outcomes, it can be argued that this approach has a number of advantages over the use of other approaches for the measurement of child poverty in the specific context of Vietnam. Firstly, all individual deprivations can be derived back to an individual child, allowing for a detailed poverty analysis down to the level of individual indicators. Secondly, the approach and its measures are child-specific, using as much information at the level of the individual child as possible. It avoids using assumptions about intra-household distributions. Furthermore, the approach is tailor-made and geared towards national use for child poverty reduction efforts. Due to its fit with the country's social and cultural standards, the approach appeals to national policymakers and is feasible with respect to available data and resources. Finally, the approach put forward in this paper proposes the estimation of child poverty incidence as well as depth and severity, making the approach compatible with monetary poverty measurement in terms of poverty analysis.

Against the backdrop of these advantages, it can serve as an important tool for policy-making and academic research, filling a knowledge gap in Vietnam and setting an example for the development of other country-specific child poverty approaches. Further research should explore the relation between multidimensional and monetary poverty measurement using the approach put forward here.

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Annex 1

Exact Definitions Individual Child Poverty Indicators as Based on MICS

See Table 6

Table 6 Exact definitions selected indicators based on MICS data

Domain	Indicators	Definition of indicator	Definition of threshold and remarks on indicator definition
Education poverty	Enrollment poverty rate	Children in age 5 not attending pre-school as a percentage of all children in age 5	Age definition used for calculating net enrollment rate per level of schooling: taking into account birth date and start of school year. including over-achieving children that are in a higher level than appropriate for their age
		Children in age 6–10 not attending primary school as a percentage of all children in age 6–10	
Children in age 11–15 not attending lower primary school as a percentage of all children in age 11–15			
	Completion poverty rate	Children in age 11–15 that have not completed primary education as a percentage of all children 11–15	All children aged 11–15 at the time of interview are considered poor when they have not completed primary school
Health poverty	Immunization poverty rate	Children in age 2–4 that have not received full immunization as a percentage of all children in age 2–4	A full immunization package includes BCG vaccination against TB, three vaccinations against DPT, three vaccinations against polio and a measles vaccination
Shelter poverty	Electricity poverty rate	Children living in a dwelling without electricity as a percentage of all children in age 0–15	
	Roofing poverty rate	Children living in a dwelling with natural/grass roof as a percentage of all children in age 0–15	Natural roof includes thatch, straw, palm leaf, bamboo tree-trunk, wood and other materials
	Flooring poverty rate	Children living in a dwelling with natural/mud floor as a percentage of all children age 0–15	Natural/improper floor includes materials as earth, simple bamboo, palm, wood plank and other materials

Table 6 continued

Domain	Indicators	Definition of indicator	Definition of threshold and remarks on indicator definition
Water and sanitation poverty	Sanitation poverty rate	Children living in a dwelling without a hygienic sanitation facility as a percentage of all children in age 0–15	Hygienic sanitation facilities includes flush toilets into sewerage, septic tanks or pit latrines, ventilated improved pit latrine, pit latrine with slab and composting latrines (following def. improved sanitation facilities—MICS)
	Water poverty rate	Children not drinking safe drinking water as a percentage of all children in age 0–15	Safe drinking water sources include private piped water into house and house's yard, public piped water, protected dug well, rain water and bottled water (following definition of improved sources—MICS)
Child work	Child work rate	Children age 5–14 that have worked for an employer, in household production or were self-employed in the last 12 months as a percentage of all children in age 5–14	Child work includes any work performed (regardless of number of days and hours worked) for a member outside of the home (paid and unpaid) as well as household production (on the rice field, family business or begging on the streets) and self-employment in the last 12 months
Leisure poverty	Toy poverty rate	Children in age 0–4 that do not have store bought or home-made toys as a percentage of all children age 0–4	–
	Book poverty rate	Children in age 0–4 not having at least one children's or picture book as a percentage of all children age 0–4	–
Social inclusion and protection poverty	Birth registration poverty rate	Children in age 0–4 not having a birth registration as a percentage of all children age 0–4	–

Annex 2

Formal Notation Child Deprivation and Child Poverty

The percentage of children falling below the specified threshold per indicator is denoted as the indicator poverty rate.

$$IV = \frac{\sum_{i=1}^n I_i}{n} \quad (1)$$

where n stands for all children for which the indicator is observable and I_i represents a dichotomous variable with value 1 if the child is below the indicator threshold and thus vulnerable and value 0 if the child meets the threshold and is not vulnerable.

The domain poverty rate reflects the rate of children experiencing deprivation within a specific domain as a percentage of children for whom the indicators within that domain are observable. The domain deprivation rate is given by

$$DV = \frac{\sum_{i=1}^n D_i}{n} \quad (2)$$

where n represents all children for which the indicators are observable and D_i stands for domain poverty, a dichotomous variable with value 1 if the child suffers deprivation within the specific domain and value 0 if the child does not suffer deprivation. A child is considered to suffer domain poor if it experiences indicator poverty for at least one indicator within that domain:

$$D_i = 1 \quad \text{if} \quad \sum_{i=1}^d I_i \geq 1 \quad (3)$$

where d stands for the total number of indicators identified per domain.

The construction of the aggregate child poverty estimates builds on domain poverty. The rates for Child Poverty can be written as follows:

$$\text{ChildPov} = \frac{\sum_{i=1}^N \text{Pov}_i}{N} \quad (4)$$

where N represents the full sample size of children aged 0–15 and Pov_i represent a dichotomous variable with value 1 if a child suffers child poverty:

$$\text{Pov}_i = 1 \quad \text{if} \quad \sum_{i=1}^D D_i \geq 2 \quad (5)$$

where D stands for the total number of domains within the specific approach.

The depth of child poverty is consequently calculated through a normalized or weighted poverty gap ratio, dividing the number of observed indicator poverty by the maximum of observable indicators for each individual child:

$$\text{Gap}_i = \frac{\sum_{i=1}^p I_i}{\sum_{i=1}^P I_i} \times 100 \quad (6)$$

where p stands for the total number of indicators for which the child is considered to be poor and P represents to the maximum of number of observable indicators for the individual child.

The aggregate child poverty depth ratio can be written as follows:

$$\text{Child Gap} = \frac{\sum_{i=1}^N \text{Gap}_i}{N} \quad (7)$$

The severity of child poverty is based on the normalized child poverty gap and can be denoted as:

$$\text{Child Depth} = \frac{\sum_{i=1}^N (\text{Gap}_i^2)}{N} \quad (8)$$

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