Child Poverty in Vietnam
Providing insights using a country-specific and multidimensional model

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Child Poverty in Vietnam – providing insights using a country-specific and multidimensional model

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In the last two decades, the issue of child poverty has received increasing attention worldwide. 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. In this paper, we develop a country-specific, multidimensional and outcome-based child poverty approach, taking into account policymakers' perspectives and current advances in child poverty measurement. The approach is applied to household survey data from 2006 to obtain an in-depth child poverty profile. Findings suggest that 37 percent of all children in Vietnam live in poverty, with the most pressing areas of deprivation being water, sanitation and leisure. Further, 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.

Key words: poverty measurement, multidimensional poverty, Vietnam

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. CHIP 2004, Gordon et al. 2003a, 2003b, 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, 2003b, Minujin et al. 2005, Young Lives 2001; 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 situation less transparent (e.g. White, Leavy and Masters 2002). Further, poverty often manifests itself as a vicious circle, causing children to be trapped in poverty from birth onwards (e.g. Corak 2006a; DWP 2002). Moreover, children have different basic needs than adults do (e.g. Waddington 2004). 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 2006).

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, creating business and entrepreneurial opportunities for Vietnamese as well as foreigners. The reforms proved to be greatly beneficial for Vietnam's economic performance, with average economic growth rates of 6.9 percent from 1988 to 1994 and 7.4 percent from 1994 to 2000 (Glewwe 2004). Furthermore, monetary poverty was also reduced notably; from 58 percent in 1993 to 19.5 percent 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 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 approach 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 concepts and underlying theories are discussed, encompassing the study's rationale and concept as well as choices inherent to the development of any poverty approach. Secondly, the data and its opportunities and limitations are outlined. Next, the conceptual framework is extended to a practical construction of the approach and the MICS data is applied to obtain empirical results. Finally, the empirical results are

discussed and tested, leading to policy implications and recommendations for further research.

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. 2008, 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 at considerable length 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) 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). Nevertheless, there are a number of drawbacks of the monetary approach, especially 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[1] (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), making one dependent on equivalence scale methods to impute poverty figures for individuals within the households, including children. 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, Leavy and Masters 2002).

Against the backdrop of these conceptual and technical drawbacks of the money-metric poverty approach, we deemed 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. Amartya Sen's work (1976, 1979) on his capability approach was groundbreaking for the topic of multidimensional poverty measurement, focusing on individuals' capabilities to reach an

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[1] Consider attributes such as literacy, numeracy, life expectancy, social participation and information.

improved standard of living that is not merely reflected as income. Capabilities can also be referred to as a "… persons freedom to promote or achieve valuable functioning" (Alkire 2002). In other words, the capabilities approach can 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 2002). 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 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. 2002). The importance of a child-centric analysis with respect to poverty is also emphasized within the deprivation approach (Gordon et al. 2003a, 2003b) and a model of child poverty for South Africa (Noble, Wright and Cluver 2006). Finally, the proposed approach is tailored to fit the social and cultural context of Vietnam, only 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 purpose, namely policy design and evaluation in Vietnam. These considerations culminate into a multidimensional, outcome-focused, child-specific and tailor-made child poverty approach for Vietnam.

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 and often corresponding with policy areas to enhance the approach's usefulness for policymakers. Further, indicators are chosen 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 2002). While some scholars, such as Nussbaum and Narayan, suggest the use of a universal list of domains and indicators (Alkire 2002), we choose to select a context-specific set that is

specific for the situation 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 choosing this study's 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. This is in contrast to conventional child poverty measures that consider children as members of a household rather than individual units of analysis. 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, 2003b). Secondly, indicators should be easily observable and thereby measurable (Moore, Lippmann and Brown 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. The indicators serve the goal to provide information about a certain aspect of child poverty and to feed into the policy making and monitoring process. To be able to use indicators to this end, they should be easily interpretable in an unambiguous way (Moore, Lippmann and Brown 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. The interviews with key-informants, 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 subjective well-being and nutrition had to be left out of consideration due to data constraints. Lack of data further restricted the inclusion of more indicators with respect to social protection and inclusion.

Table 1 Indicators of the Vietnam Child Poverty Approach[2]

	1. Education poverty
1	Enrollment poverty rate
a	children in age 5 not attending pre-school as a percentage of all children in age 5
b	children in age 6-10 not attending primary school as a percentage of all children in age 6-10
c	children in age 11-15 not attending lower secondary school as a percentage of all children in age 11-15
	Completion poverty rate
2	children in age 11-15 that have not completed primary education as a percentage of all children 11-15
	2. Health poverty
	Immunization poverty rate
1	children in age 2-4 that have not received full immunization as a percentage of all children in age 2-4
	3. Shelter poverty
	Electricity poverty rate
1	children living in a dwelling without electricity as a percentage of all children in age 0-15
	Roofing poverty rate
2	children living in a dwelling without a proper roof as a percentage of all children in age 0-15
	Flooring poverty rate
3	children living in a dwelling without a proper floor as a percentage of all children age 0-15
	4. Water and Sanitation poverty
	Sanitation poverty rate
1	children living in a dwelling without a hygienic sanitation facility as a percentage of all children in age 0-15
	Water poverty rate
2	children not drinking safe drinking water as a percentage of all children in age 0-15
	5. Child work
	Child work rate
1	children age 5-14 that have worked for an employer, in household production or self-employer in the last 12 months as a percentage of all children in age 5-14
	6. Leisure poverty
	Toy poverty rate
1	children in age 0-4 not having store bought or home-made toys worth as a percentage of all children age 0-4
	Book poverty rate
2	children in age 0-4 not having at least one children's or picture book as a percentage of all children age 0-4
	7. Social Inclusion and Protection poverty
	Birth registration poverty rate
1	children in age 0-15 not having a birth registration as a percentage of all children age 0-4

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

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

and Foster 2008). Can some aspects be considered more important than others and should thereby be assigned greater weights? And what guides the decision with respect to the weighting schemes? Regardless of the 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. 2003, Bradshaw et al. 2006, Land 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 Rutten 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 have chosen to 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 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. Further, 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). It was previously used in the global child poverty study by Gordon et al. (2003), referred to as absolute poverty and also proves highly appropriate for our purposes. Individual poverty results are aggregated to arrive at a child poverty headcount. 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. 2003, Alkire and Foster 2008). For comparative purposes and in order to evaluate the use of the dual cut-off identification strategy, we produce poverty rates using poverty in one domain as well as two domains. Poverty outcomes on the basis of the union approach are referred to as *Child Deprivation* while outcomes based on the dual cut-off identification strategy are referred to as *Child Poverty*.

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, reproductive health, 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. The survey provides data on a range of issues related to children's well-being and poverty. A number of limitations are also inherent to the use of the MICS. A first limitation is that the micro-data from the survey is not collected for all children of all groups. While information on health is only collected for children up to five years of age, educational information is only collected for children aged five and upwards. Hence, the total number and types of deprivations that a child suffers theoretically depends on the age category. A second limitation is that data on nutrition is not available at the time of writing. This is a considerable drawback as nutritional indicators are important aspects of a multidimensional measurement of child poverty. Third, 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 in communes and urban wards in Vietnam that have lived in the enumeration area for at least six months (Pincus and Sender 2006). This implies that households or individuals that have recently migrated are not included in the sampling frame (Edmond and Turk 2004). Furthermore, due to the strict household registration system, or *ho khau* 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 present us with underestimations for child poverty. A final limitation of the data is that it is only representative when broken down to regional level but does not permit us to consider child poverty at a lower level of disaggregation such as the province or district.

Results

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 indicator can be observed.

Table 2 Indicator poverty rates

	Education poverty		Health poverty	Shelter poverty			Water and Sanitation poverty		Child work	Leisure poverty		Social Incl and Prot poverty
	MICS, n=8167, age 5-15	MICS, n=4381, age 11-15	MICS, n=1612, age 2-4	MICS, n=10874, age 0-15			MICS, n=7728, age 5-14		MICS, n=2680, age 0-4			
	Ind. 1 – Enrollment poverty rate (% children not enrolled)	Ind. 2 - Completion poverty rate (% children not having completed primary school)	Ind. 3 – Immunization poverty rate (% children not fully immunized)	Ind. 4 - Electricity poverty rate (% children in dwellings without electricity)	Ind.5 - Roofing poverty rate (% children in dwellings without proper roofing)	Ind. 6 - Flooring poverty rate (% children in dwellings without proper flooring)	Ind. 7- Sanitation poverty rate (% children in dwellings without hygienic sanitation)	Ind. 8 - Drinking water poverty rate (% children in dwellings without safe drinking water)	Ind. 9 - Child work rate (% children working)	Ind. 10 - Toy poverty rate (% children not having toys)	Ind. 11- Book poverty rate (% children not having at least one book)	Ind. 12 - Birth registration poverty rate (% children not having birth registration)
Total	18.38	9.11	31.37	4.02	9.01	21.95	41.10	12.56	23.67	29.32	65.63	12.37
Gender												
Male	18.93	9.54	31.61	4.27	9.18	22.57	41.62	12.29	22.97	27.87	64.35	12.75
Female	17.79	8.66	31.14	3.76	8.82	21.30	40.54	12.85	24.39	30.90	67.02	11.95
Area	***	***	***	***	***	***	***	***	***	***	***	***
Urban	12.27	5.12	20.16	0.65	2.22	6.75	13.06	3.26	10.40	10.71	40.41	5.73
Rural	19.99	10.19	34.86	4.95	10.87	26.13	48.79	15.11	27.19	35.08	73.43	14.42
Region	***	***	***	***	***	***	***	***	***	***	***	***
Red River Delta	12.65	2.45	16.94	0.00	1.04	4.74	13.41	1.26	23.25	13.97	50.79	2.22
North East	20.67	14.39	52.78	13.59	25.64	51.46	51.55	19.34	33.24	62.02	78.05	17.42
North West	33.57	20.28	58.90	28.09	18.82	69.49	74.63	30.96	40.69	41.58	74.73	24.73
North Central Coast	13.08	4.87	33.01	0.28	5.76	12.70	35.74	8.47	30.01	44.76	73.02	12.70
South Central Coast	16.67	7.79	23.35	1.06	3.18	8.71	40.76	11.29	18.63	21.79	55.71	13.21
Central Highlands	22.30	17.49	42.59	6.57	2.90	18.24	57.01	18.02	14.81	40.27	71.81	21.70
South East	20.37	8.98	21.29	1.75	1.35	6.85	26.45	7.17	15.54	18.75	55.36	4.17
Mekong River Delta	23.23	13.73	32.29	3.18	17.86	38.99	69.17	23.41	20.88	18.98	75.30	19.88
Ethnicity	***	***	***	***	***	***	***	***	***	***	***	***
Kinh/Chinese	16.33	6.9	25.51	1.03	5.22	13.77	33.79	8.98	21.24	20.74	61.65	8.44
Other	28.76	21.11	5853	18.84	27.74	62.41	77.25	30.28	35.81	69.35	84.29	30.62

Age groups	***	***		***	***	***	***		***	***	***	***
0-2	na	na	32.60	4.46	9.41	22.89	43.59	12.42	na	31.99	70.87	14.92
3-4	na	na	30.71	4.55	9.06	24.49	45.47	13.67	na	25.18	57.48	8.38
5	17.65	na	na	5.10	10.05	25.74	45.45	13.64	1.01	na	na	na
6-10	6.87	na	na	4.68	10.43	23.51	41.77	13.01	11.69	na	na	na
11-14	17.49	9.86	na	3.26	7.54	19.09	38.16	11.73	38.19	na	na	na
15	59.64	6.37	na	2.64	8.32	20.56	37.76	12.47	na	na	na	na

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

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 book and 41 percent of all children live in a dwelling without a hygienic sanitation facility. One out of three children aged 2 to 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 percent. Almost one out of five children aged 5-15 are not net enrolled. 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 percent. Demographic decomposition of these figures displays large disparities for some groups, which can also differ from indicator to indicator. Across the board, there is no sign of gender inequality. All indicators display fairly equal poverty rates for boys and girls. Decomposition by area, however, suggests a large urban-rural divide in Vietnam. Although significant, the rates and their differences are fairly modest with respect to the educational and social protection indicators. However, large disparities can be observed especially when considering the water and sanitation and shelter domains. Poverty incidence in terms of these indicators is four to seven times higher in rural areas than it is in urban areas. Regional results also display considerable differences with respect to indicator poverty rates. The Red River Delta region holds the smallest percentage of vulnerable children in terms of all indicators, except for child labor. The Northern mountainous North West and North East regions are always among the regions with the highest proportion of vulnerable children followed by the Mekong River Delta and Central Highlands regions. Nevertheless, the regional rankings of poverty rates differ from indicator to indicator, especially among the middle rankings. The North Central Coast region, for example, ranks second best with respect to the educational indicators while it has the second largest poverty rate when considering the leisure domain. Finally, interpretation of age group results is less straightforward as not all indicators are observed for all children. Nevertheless, the results indicate, in line with intuition, that older children are more vulnerable with respect to net enrollment while a larger proportion of younger children suffer poverty in terms of leisure and social protection and inclusion.

The poverty results for the individual indicators are further aggregated to arrive at composite poverty indicators, which are presented in Table 3. Along the lines of the union approach, child deprivation is constituted by deprivation in at least one domain. By the same token, the dual cut-off identification strategy implies that child poverty is based on deprivation in at least two domains.

Table 3 Child deprivation and poverty rates

	Child deprivation	*Child poverty*
Total	66.97	36.65
Gender		
Male	66.39	36.86
Female	67.58	35.42
Area	***	***
Urban	38.80	12.04
Rural	74.70	43.40
Region	***	***

Red River Delta	47.63	11.26
North East	80.20	58.76
North West	93.09	77.65
North Central Coast	68.49	30.95
South Central Coast	60.61	28.79
Central Highlands	74.21	40.53
South East	55.14	22.63
Mekong River Delta	83.20	59.95
Age group	***	***
0-2	82.98	51.12
3-4	76.50	52.04
5	60.52	28.08
6-10	56.21	27.30
11-14	65.38	35.05
15	73.59	36.14

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

Overall child deprivation amounts to 67 percent, while 37 percent of all children are identified to be poor. The patterns for both child deprivation and child poverty considering different demographic groups are similar to those observed for individual indicators. There is no significant difference in poverty incidence for boys and girls. Furthermore, poverty incidence is much higher in rural areas than it is in urban areas, regardless of the poverty definition used. Rural child deprivation is 74 percent compared to 39 percent in urban areas. The disparity is even greater in terms of child poverty with respective rates of 12 and 43 percent. Regional figures point towards the North West and North East regions as bad performers while the Red River Delta and South East regions hold the lowest poverty rates. Child poverty has an incidence rate of 11 percent in the Red River Delta, while this amounts to 78 percent in the North West region. 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 2007). 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. For example, 7 indicators are observable for children in age bracket 6-10 while 9 indicators are observable for those in age bracket 3-4. Hence, the latter group by definition has more chance to be included in the poverty figures.

The figures in Table 3 indicate that child deprivation is almost twice as high as child poverty, basing poverty measurement on the union approach compared to the dual cut-off identification strategy. The high headcount rate for child deprivation confirms the previously identified inclusive nature of the method, suggesting that it suffers a large inclusion error and does not discriminate well between poor and non-poor children. This finding underlines the conceptual reasoning to employ child poverty as the most preferred method. Moreover, we tested the robustness of results. Sensitivity was checked by plotting child poverty rates against various cut-off points/poverty lines for children living in different regions. Figure 1 indicates that poverty rankings only change when using cut-off points higher than two domains, illustrating the approach's robustness.

Figure 1 Sensitivity plot
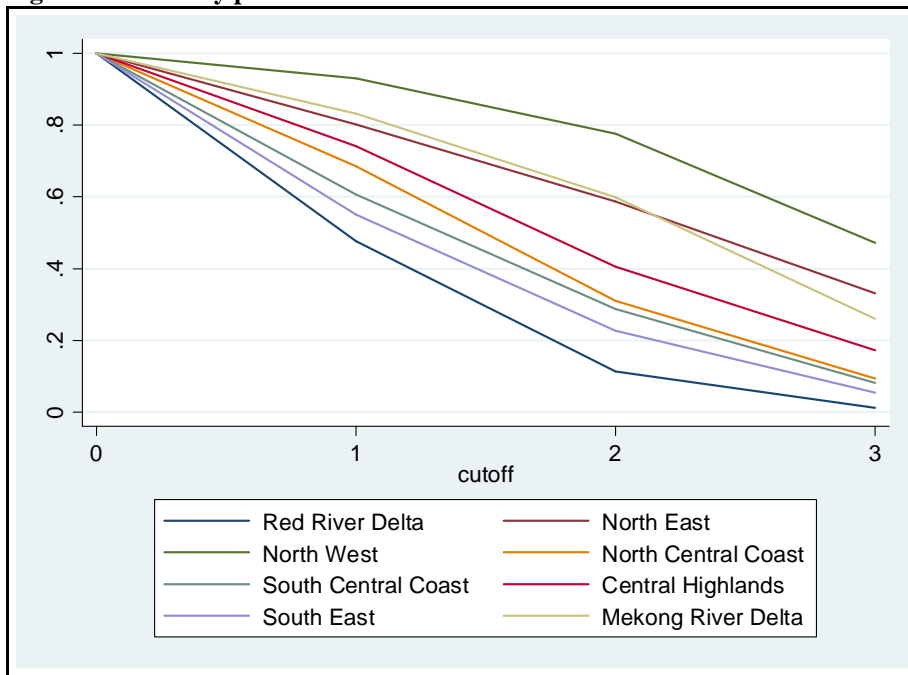
After having considered indicator and poverty headcount results, Tables 4 and 5 provide a more in-depth look at child poverty by considering the proportions of children suffering poverty in multiple domains. Table 4 indicates the proportion of children suffering a specific combination of deprivations as a share of all children for which the deprivations can be observed. It also reports the correlation coefficients for the corresponding combinations. Table 5 provides insight into the overlap of domain poverty by reporting domain poverty incidence as a proportion of those children vulnerable to the reference domain.

Table 4 Multiple poverty and correlation matrix

	education 5-15	health 2-4	shelter 0-15	water and sanitation 0-15	labor 5-14	leisure 0-4	social inclusion and protection 0-4
education	5-15, n=8167 **18.71**	x	5-15, n=8167 **6.71** 0.1626*	5-15, n=8167 **10.92** 0.1654*	5-14, n=7228 **4.79** 0.1309*	x	x
health		2-4, n=1627 **31.37**	2-4, n=1627 **12.75** 0.2745*	2-4, n=1627 **19.16** 0.2209*	x	2-4, n=1627 **23.20** 0.2084*	2-4, n=1627 **4.19** 0.2029*
shelter			0-15, n=10874 **24.57**	0-15, n=10874 **20.40** 0.4351*	5-14, n=7228 **7.08** 0.1167*	0-4, n=2707 **22.80** 0.2574*	0-4, n=2707 **6.74** 0.2730*
water and sanitation				0-15, n=10874 **44.07**	5-14, n=7228 **12.05** 0.1043*	0-4, n=2707 **39.50** 0.3232*	0-4, n=2707 **9.44** 0.2660*
labor					5-14, n=7228 **23.67**	x	x
leisure						0-4, n=2707 **69.06**	0-4, n=2707 **11.53** 0.2257*
social inclusion and protection							0-4, n=2707 **12.37**

Notes: X indicates that no overlap could be observed due to non-corresponding age groups
*<0.01, significance level correlation coefficient

The most prevalent combinations of deprivation inevitably include domains with the highest poverty rates. The combined deprivation of leisure and water and sanitation is most prevalent with an incidence rate of 40 percent for children age 0-4. In other words, 4 out of 10 children in Vietnam aged 0-4 suffer deprivation with respect to leisure as well as water and sanitation. Shelter and health poverty in combinations with leisure poverty is suffered by respectively 23 percent of the different age groups. The domains referring to housing conditions are most strongly associated with a correlation coefficient of 0.435. Despite high incidence rates, the correlation coefficients do not display a high degree of correlation between domain deprivations. These low coefficients are largely due to taking the whole child population in Vietnam as reference group. The poverty incidence rate is 37 percent, meaning that 63 percent of all children do not suffer deprivation in a combination of at least two domains. The inclusion of the non-poor children in the reference group weakens the overall correlation coefficients.

For an alternative perspective, Table 5 presents the poverty in one domain as a proportion of poverty in another domain. These figures provide a more detailed insight into the association between deprivations in two different domains. For example, 36 percent of all children aged 5-15 that are educationally poor are also deprived with respect to shelter.

Table 5 Overlap domain poverty

	education 5-15	health 2-4	shelter 0-15	water and sanitation 0-15	labor 5-14	leisure 0-4	social inclusion and protection 0-4
education	5-15, n=8167	x	5-15, n=8167	5-15, n=8167	5-14, n=7228	x	x
	100		**35.86**	**58.37**	**35.97**		
health	x	2-4, n=1627	2-4, n=1627	2-4, n=1627	x	2-4, n=1627	2-4, n=1627
		100	**40.98**	**61.55**		**74.52**	**13.47**
shelter	5-15, n=8167	2-4, n=1627	0-15, n=10874	0-15, n=10874	5-14, n=7228	0-4, n=2707	0-4, n=2707
	27.83	**29.59**	**100**	**83.05**	**29.08**	**87.89**	**25.98**
water and sanitation	5-15, n=8167	2-4, n=1627	0-15, n=10874	0-15, n=10874	5-14, n=7228	0-4, n=2707	0-4, n=2707
	25.39	**24.41**	**46.29**	**100**	**27.85**	**83.63**	**19.99**
labor	5-14, n=7228	x	5-14, n=7228	5-14, n=7228	5-14, n=7228	x	x
	20.24		**29.91**	**50.93**	**100**		
leisure	x	2-4, n=1627	0-4, n=2707	0-4, n=2707	x	0-4, n=2707	0-4, n=2707
		37.39	**33.32**	**57.73**		**100**	**16.85**
social inclusion and protection	x	2-4, n=1627	0-4, n=2707	0-4, n=2707	x	0-4, n=2707	0-4, n=2707
		47.22	**54.93**	**76.94**		**93.98**	**100**

Notes: X indicates that no overlap could be observed due to non-corresponding age groups

Results in Table 5 indicate that 83 percent of all children suffering shelter poverty are also vulnerable to water and sanitation. In other words, deprivation in the shelter domain is highly associated with deprivation with respect to water and sanitation. However, less than half of all children that are vulnerable with respect to water and sanitation are also shelter vulnerable, explaining the relatively low correlation coefficient reported in Table 4. Results further indicate that the leisure domain captures large proportions of groups suffering poverty in other domains. More than 80 percent of those children being shelter and water and sanitation vulnerable also suffer poverty in the leisure domain while this amounts to 94 percent for those children poor with respect to social inclusion and protection. Generally, children being deprived in social inclusion and protection seem more prone to suffering poverty in other domains. The results in Tables 4 and 5 further indicate that the correlation and overlap of poverty in the education and labor domains is weak, which seems rather counter-intuitive. One would expect that children being vulnerable to labor also suffer education poverty because they do not have time to go to school, for example. However, the correlation coefficient for this combination is only 0.13 with merely 20 percent of those in child labor being educationally deprived. These results suggest that child labor does not necessarily imply that children do not go to school as a result.

Conclusion

In this paper, we put forward 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 development of a child poverty approach that is multidimensional in nature combined with an outcome and child-specific focus and in reference to the country-specific context comprises the study's contribution in conceptual

terms. Empirical outcomes provide information about the specific aspects of child poverty, a child poverty profile and an analysis of the overlap of domain poverty in Vietnam.

Empirical findings highlight a number of relevant issues. The results suggest that the most pressing areas for children in Vietnam are water and sanitation and leisure. Poverty is lowest with respect to education, in terms of both net enrollment and primary school completion. Further, more information is needed on social protection and inclusion to gain a better understanding of this area of development. Child poverty rates indicate that more than one third of all children in Vietnam live in poverty, which is higher when compared to the standard monetary poverty measurement. 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. On the basis of the currently used methodology and data, it is not possible to draw a well-informed conclusion on child poverty for various age groups. Analysis of combined domain vulnerabilities and overlap of deprivations indicate that poverty referring to shelter and water and sanitation are most closely related. Furthermore, children that are vulnerable in terms of social inclusion and protection seem to be more prone to suffering poverty in other domains whilst children performing labor are not necessarily more deprived with respect to education.

Considering the paper's conceptual and empirical 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 deprivations can be derived back to an individual child, allowing for a detailed poverty analysis. Secondly, the approach is child-specific, using as much information at the level of the individual child as possible. It avoids using assumptions about intra-household distributions. Finally, 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. 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. It provides detailed information that is decomposable at different levels of analysis, allowing for detailed policy design and evaluation. Further research should address the shortcomings of the current analysis. In specific, further research efforts should be directed towards the extension of the child poverty headcount to a depth and severity index. Several imputation methods to derive non-observable outcomes for children are to be examined and tested. Moreover, an interesting and useful extension of this study would be the assessment of overlap between child poverty as measured by a monetary approach compared to a multidimensional approach.

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Annex 1 Exact definitions individual child poverty indicators as based on MICS

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
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	-

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