Gender Inequality in Vietnam: Providing Insights Using Longitudinal Data and Multidimensional Approach

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Abstract

There has been an expansion in the literature on gender inequality using multidimensional measures in recent years. This paper focuses on the longitudinal aspects of gender inequality. Using panel household survey data in Vietnam from 2007, 2008, and 2010, the paper analyses and compares the prevalence and the dynamics of multidimensional poverty for men and women. The results show that women still had much lower level of performance than men in all indicators of well-being. Moreover, women have shown a slower progress in the advancement of most the indicators, and are more vulnerable to shocks and risks. The results suggest that men who have better access to resources, markets and public services have benefited more from the economic growth as experienced by Vietnam while women are still left behind and be more vulnerable to shocks.

Keywords: gender inequality, multidimensional poverty, poverty dynamics

JEL classification: I31, I32, D31

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1 Introduction

In the literature there is an increasing discussion of differences between men and women in well-being. There have been extensive investigations on gender differences in income (Dollar and Gatti, 1999; Blau and Kahn, 2000). They argue that women are usually discriminated which consequently makes them have less access to production inputs, have less skills, and have less leisure time than men. They therefore have higher level of vulnerability to poverty. Yet, the literature has argued on the shortcomings of monetary measures of gender differences and the need for alternative approaches. It is argued that markets often do not exist or function imperfectly (Tsui, 2002; Bourguignon and Chakravarty, 2003; Thorbecke, 2008) and monetary values cannot be assigned to particular aspects of well-being (Hulme and McKay, 2008; Thorbecke, 2008).

From the capability perspective, the performance in outcomes, or human development, is more important than the performance in inputs, such as income or consumption. Therefore, the

analysis of gender differences has focused more on outcomes rather than on flows or inputs and uses non-monetary indicators more extensively (Arora, 2014; Batana, 2008; Vijaya, 2014; Wiepking and Maas, 2005; Cantillon and Nolan, 2001). However, little is known about the gender difference in the transitions of poverty using non monetary measure.

This study addresses the static and dynamic differences between men and women using multidimensional poverty index in the context of Vietnam although we believe that the approach is applicable to other developing countries. Vietnam has been extremely successful in sustaining a high economic growth rate of more than seven percent per annum during the last two decades. It has also been successful in translating the results of economic growth into income poverty reduction by lifting some 35 million people (about 40 percent of the population) out of income poverty since the implementation of a reform program in the 1980s. Along with the economic achievements, there have been significant improvements in human capital such as health, education, and gender equality (UNICEF, 2012).

A natural question, given this evident success in reducing gender inequality, is whether the pace and pattern of reduction in multidimensional poverty for men and women are similar. This study is based on the hypothesis that men poverty has fallen faster over time owing to having better access to production inputs and markets. The analyses of multidimensional poverty are based on the Alkire-Foster method and panel data from more than 2000 households in Vietnam collected in 2007, 2008 and 2010 to identify which sub-groups of the population have better/worse gender difference in poverty and to analyze the dynamics of poverty for men and women over time.

This study is organized as follows: the introduction is followed by Section 2 which presents the data source and analytical strategy. Section 3 shows the multidimensional poverty profile across different population subgroups and discusses the differences between men and women poverty by population subgroups. Section 4 explores the pattern of poverty dynamics of men and women over time and discusses the changes in components as well as the changes in different measures of multidimensional poverty. Lastly, Section 0 concludes with the key messages of this study.

2 Data and analytical strategy

2.1 Data

This study employs panel household data from 2007, 2008 and 2010 collected from the provinces of Hà Tĩnh, Thừa Thiên Huế and Đăk Lăk in Vietnam in the context of the research project “Vulnerability in Southeast Asia” run by a consortium of German universities and local research institutes in Thailand and Vietnam (see Klasen and Waibel, 2012). The household surveys cover more than 2000 households, including more than 2000 men and more than 2000 women, located in coastal, plain and mountainous areas. They contain information on household demographics, health, education, economic activities, shocks and risks,

employment, financial market access, public transfer, household consumption, assets, and housing conditions.

There have been a number of household surveys in Vietnam including the Multiple Indicator Cluster Surveys (MICS), the Demographic and Health Surveys (DHS), and the Vietnam Household Living Standard Surveys (VHLSS). However, these surveys are in the form of either repeated cross-sections such as the MICSs and the DHSs or partially repeating panels such as the VHLSSs making them less useful than panel data in analyzing the changes of individuals' poverty status over time. Therefore, the surveys employed in this study contain particularly suitable data for the analyses.

2.2 Identification of the multidimensionally poor

I will apply the recently proposed Alkire-Foster method (see Alkire and Foster, 2011) to identify the multidimensionally poor at individual level. I then compare measures of poverty across two groups of men and women to find if there are disparities between the two groups in deprivation. The dynamics of poverty by the two groups are then compared via joint probability matrices to find which groups recorded that faster progress was being made over time. Subsequently, the study attempts to find which indicators play an important role in driving the changes in the Multidimensional Poverty Index.

Notation and definition of multidimensional poverty

The multidimensional poverty index, which is based on Alkire-Foster method, measures poverty in d indicators across a population of n individuals. Let $z_j > 0$ be the deprivation cutoff in indicator j, and w_j be the weight of indicator j such that the weights sum to one. I construct a matrix of deprivations $g^0 = [\, g_{ij}^0 \,]$, whose typical element g_{ij}^0 is defined by $g_{ij}^0 = w_j$ when $y_{ij} < z$, and $g_{ij}^0 = 0$ when $y_{ij} \geq z$.

I then construct a column vector c of deprivation counts, whose j^{th} entry $c_i = \sum_{j=1}^{d} g_{ij}^0$ represents the sum of weighted deprivations suffered by person i. Second, a person is considered poor if his or her weighted deprivation count is greater than or equal to k. Let ρ_k be the identifier that indicates a person's achievement vector. ρ_k takes value of 1 when $c_i \geq k$, and 0 when $c_i < k$.

To focus on poor people, we censor the deprivations of persons who are deprived and non-poor by constructing a matrix $g^0(k)$, obtained from g^0 by replacing its i_{th} row g_i^0 with a vector of zeros whenever $\rho_k = 0$. This matrix contains the weighted deprivations of all persons who are identified as poor and exclude deprivations of the non-poor. Base on this matrix, we construct a censored vector of deprivation counts $c(k)$ which differs from vector c in that it counts zero deprivations for those not identified as multidimensionally poor. Multidimensional poverty index (MPI) is the mean of the matrix $g^0(k)$ multiplied by d (the number of columns is equal to d). That is $MPI = d\mu(g^0(k))$, where μ denotes the arithmetic mean operator.

The multidimensional poverty index can be decomposed into two measures: the multidimensional headcount ratio (*H*) and the average deprivation share among the poor (*A*). *H* is the proportion of people that are poor and is measured by $H = q/n$ where q is the number of poor people. The fraction of weighted indicators that person i is deprived is $c_i(k)$. The average of that fraction among the poor is then expressed as $A = \sum_{i=1}^{n} c_i(k) \big/ q$.

Dimensions, indicators, deprivation cutoffs and weights

The multidimensional poverty index in this study is constructed following the international Multidimensional Poverty Index (MPI) that was presented in the Human Development Report 2010 (UNDP, 2010) and in Alkire and Santos (2014) but adjusts the indicators to data availability. Similar to Tran, Alkire and Klasen (2015), nine indicators are included in the multidimensional poverty index: nutrition, health functioning, schooling, cooking fuel, sanitation, drinking water, electricity, housing and assets. This study will identify deprivations of the first three indicators at individual level. The other six indicators of living standard are identified at household level data.

Table 1 Dimensions, indicators, cut-offs and weights

Dimensions Indicators	Deprived if…	Relative weight
Health		
Nutrition	An individual has BMI of less than 17	16.7%
Health functioning	An individual suffers serious disease/injury and unable to pursue main occupation for at least four weeks	16.7%
Education		
Schooling	An individual has not completed five years of schooling	33.3%
Standard of living		
Cooking fuel	The household cooks with dung, wood, rice leaf or charcoal	5.6%
Sanitation	The household's sanitation facility is not improved, or it is improved but shared with other households	5.6%
Drinking water	The household does not have access to clean drinking water	5.6%
Electricity	The household has no electricity	5.6%
Housing	The walls are of metal/clay/canvas/bamboo and/or the roof is of straw/wood	5.6%
Assets	The household does not own more than one of: radio, television, telephone, bike, motorbike or refrigerator, and does not own a car or tractor	5.6%

Source: Normative choice by authors with reference to the data available, the MDGs, UNDP (2010) and Alkire and Santos (2014).

Nutrition and health functioning are chosen as the two indicators of the health dimension. This study uses the body mass index (BMI) of adults who are 18 years old or older to identify the deprivation in nutrition. A person is deprived in nutrition if his or her BMI is less than 17. This lower cutoff, as compared to the cutoff of 18.5 in the MPI, was proposed by James et al. (1988) and Himes (2000) and applied by Baulch and Masset (2003) and is reasonable for the case of Vietnam where people have lower BMIs in general. Health functioning is used as

another indicator that expresses health status. A person is deprived in health functioning if he or she had any disease or injury during the 12 month reference period and was unable to pursue his or her main occupation for more than four weeks (see Table 1). A person is deprived in schooling if he or she has less than five years of schooling (see Table 1). A person is deprived in cooking fuel if his or her household's main cooking fuel is dung, wood, rice leaf or charcoal. He or she is deprived in sanitation if his or her household has no flushing toilet (note the higher cutoff, compared to the global MPI) or the household has a flushing toilet but must share it with another household. A person is deemed as being deprived in drinking water if his or her household has no access to clean (defined here as tap, purified or rain) drinking water. A person is deprived in electricity if his or her household's main source of lighting is not electricity. A person is deprived in housing if the main walls of his or her main house[1] are made from metal, clay, canvas, or bamboo or if the roof of the main house is made from straw or wood. Lastly, a person is deprived in assets if his or her household does not own more than one of the following: radio, television, telephone, bike, motorbike, or refrigerator, and if the household does not own a car or tractor.

The three dimensions are assigned equal weights of 33.3 percent, and indicators of the same dimension are then assigned equal weights (see Table 1). Hence, the two health indicators have the weights of 16.7 percent each, schooling has a weight of 33.3 percent, and the six indicators representing standards of living have weights of 5.6 percent each.

Setting a multidimensional poverty cut-off

The global MPI defines a person as being vulnerable to poverty if he or she is deprived of between 20 and 33 percent of the indicators. Practically, if a household or a person is deprived in one or two indicators, i.e. being deprived in 10 or 20 percent of the indicators, that household/person's well-being is still fine as the overall deprivation is still quite low; if deprivation rises above 20 percent, the risk of being multidimensionally poor rises. This study defines a person as being multidimensionally poor if he or she is deprived in 33 percent or more of the indicators.

3 Multidimensional measures of gender inequality

3.1 Gender inequality across population subgroups

This section describes the overall picture of gender inequality in multidimensional poverty over the period 2007 – 2010. It then examines whether there are disparities in poverty between men and women across population subgroups. Population subgroups are classified by household size, ethnicity, education attainment, ecological zones, and provincial location. The comparison will focus on a period of 2010 as a representative for other years although I believe that the pattern of disparities might change slightly over time.

[1] A household might have more than a house. This study focuses on the main house only.

Women generally had higher risk to poverty than men. The ratio of women who were multidimensionally poor at any cut-off and year was substantially higher than that of men. At the cut-off of 33 percent for instance, 30 percent of men were poor while close to 41 percent of women were poor in 2007 (see Table 2).

Table 2 Poverty headcount ratio by gender between 2007 and 2010, percent

Poverty		Men				Women			
category	cut-off (%)	2007	2008	2010	2007-10	2007	2008	2010	2007-10
Non-poor	20	38.9	33.8	33.3	-5.6	49.5	46.0	46.1	-3.4
Poor	33	29.8	26.4	26.0	-3.9	40.8	39.1	39.1	-1.1
Extremely poor	50	17.1	15.9	14.2	-2.9	24.5	24.3	22.4	-2.1

Source: Calculation from Vulnerability survey data

Note: 2007-10 indicates period 2007 – 2010

Table 3 Poverty headcount ratio and average deprivations by gender in 2010, percent

	Headcount ratio		Average deprivation		Population share	
	Men	Women	Men	Women	Men	Women
Average	26.2	39.2	48.4	50.0	2,085	2,306
Household size						
1	20.4	62.5	63.9	56.8	0.5	2.2
2	33.7	44.3	50.2	52.8	10.9	11.9
3	23.2	36.8	47.8	47.8	14.1	14.7
4	21.6	32.2	48.1	48.2	24.2	23.0
5	24.2	35.0	47.8	49.3	21.2	20.7
6	25.3	40.1	48.2	47.9	14.5	13.4
7 +	35.1	50.8	48.1	52.4	14.5	14.1
Education						
none	67.4	70.7	52.6	54.1	12.0	19.9
primary	46.9	55.1	50.5	52.9	20.1	24.6
middle	11.3	29.4	40.1	45.6	43.7	41.6
secondary	12.1	22.9	44.1	45.2	18.4	10.3
tertiary	10.1	18.4	39.6	46.2	5.8	3.6
Ethnicity						
Kinh (majority)	21.5	35.0	46.8	48.4	81.7	82.7
Minority groups	46.2	58.7	51.7	54.4	18.3	17.3
Province						
Hà Tĩnh	22.1	32.4	47.4	48.5	35.4	38.6
Thừa Thiên Huế	26.0	47.8	47.5	48.4	22.1	21.9
Dăk Lăk	29.2	40.8	49.4	52.1	42.5	39.4
Ecological zone						
Coastal	26.1	36.7	47.4	47.9	25.6	28.3
Plain	22.3	37.7	48.5	50.3	37.6	36.6
Mountainous	29.6	42.4	48.9	51.0	36.8	35.1

Source: Calculation from Vulnerability survey data

Note: The population share of the same category sum to 100. Values in this table refer to poverty cut-off 33 percent.

There was a substantial difference between men and women in the ratio of poverty. Only slightly higher than 26 percent of men were poor in 2010 while close to 40 percent of women

were poor in the same year. Among those who were poor, women had slightly higher intensity of poverty (49.7 percent) as compared to 48.2 percent for men (see Table 3).

The difference between men and women varies across population subgroups. There seems to be a convex relationship between household size and gender difference, i.e. it starts at high level when household size is small (1 and 2 members) and goes down slightly when household size is 3, 4, and 5 and goes up again when household size reaches 6 and more (see Table 2 and Table 3). In small size households, male bread-winner are usually missing, this consequently makes these households poorer than other households. Women from these households are therefore more likely to be poor. In big size families there are usually old women (because women generally live longer than men) who are often deprived in health and education, the important indicators of the multidimensional poverty index. As a result women from big families have higher risk to poverty.

The literature argues that the education of household members has positive effects on overall household's well-being (see Becker, 1967). This study also finds that people with lower educational attainment (has no schooling or attains primary education only), are more likely to be poor. They also have a higher intensity of poverty. The poverty ratios and the intensity of poverty decrease substantially when a man or a woman attaints higher educational levels. There seems to be a concave relationship between the difference between men and women in poverty and educational attainment of a man or woman. The difference starts at small level when a man or woman has no schooling and becomes larger when he or her attaints middle and secondary school, it become small again when a man or woman attaints tertiary level (see Table 3).

There are gaps between the risks of being poor for men and women across ethnic groups. Ethnic minority groups account for closed to 17 percent of the three provinces' population and usually live in mountainous and remote areas where the infrastructure is in poor condition. They also have less access to education, health care services, and markets, thus they are more likely to be poor as well as have a higher intensity of multidimensional poverty (see **Error! Reference source not found.**). Additionally, there are gaps in the risks of being poor between men and women of the same category. A woman from the majority Kinh background is more likely to be multidimensionally poor than a man. One can see the same pattern among ethnic minority groups. Interestingly, the gender gap is wider for the Kinh (see **Error! Reference source not found.**). This suggests that men of the majority Kinh group have a lot more chance to access to market, allowing them to be better off than women while men from ethnic minority groups have many barriers preventing them from getting much better off than women.

3.2 Gender differences in the transitions of poverty

The disparities in the mobility between men and women are compared using joint probability matrices over the period from 2007 to 2010. The left panel of Table 4 shows the transitions

from extremely poor, moderately poor, and non-poor between 2007 and 2010 among men. The rows show what share of the population was extremely poor, moderately poor, and non-poor in 2007. The columns also show the share of the population belonging to those three ranges in 2010. The extremely poor classified in this matrix refers to those who are deprived in 50 percent of weighted indicators, the moderately poor are those who are deprived in between 33 and 50 percent of weighted indicators, and the non-poor are those who deprived in less than 33 percent of weighted indicators. The values in the diagonal of this matrix show the shares of the population that stayed in the same poverty status. Similarly, the right panel of **Error! Reference source not found.** shows the transitions of multidimensional poverty at between 2007 and 2010 among women. For the sake of comparison, poverty cut-offs in this panel were the same as in the left panel.

Men and women have different pattern of poverty. The ratios of women belonging to extremely poor and moderately poor groups are larger than those of men, while men have higher chance to be non-poor than their counterparts (slightly higher than 69 percent as compared to closed to 59 percent) (see Table 4).

Men and women had different levels of mobility across sub-groups of the population as well as over time. Poor men had higher upward mobility than women. Among men who were poor in 2007 (closed to 18 percent), only 64 percent (11.4 percent out of 18 percent) stayed poor in 2010 while others had moved out of poverty. This fraction was 71 percent (18.1 percent out of 25.4 percent) for women. A similar pattern can be seen among the vulnerable group, men also made a faster upward mobility than women. On the contrary, women had a slightly higher downward mobility than men. Among women who were non-poor in 2007, slightly higher than 4 percent (2.4 percent out of 29 percent) fell into poverty in 2010 while this fraction was only a slightly above 2 percent (1.6 percent out of 69 percent) (see Table 4). This suggests that men, who had better access to resources and markets, benefited more from economic growth than women did. In addition, the higher level of vulnerability to poverty of women implies that women are still discriminated; this can be in the form of having less chance to go to school, having less chance to access to good health care service.

Table 4 Joint probability matrices of poverty transitions 2007-2010, percent

	Men, 2010				Women, 2010			
2007	Extremely	Moderately	Non-poor	Total	Extremely	Moderately	Non-poor	Total
Extremely	11.0	3.9	2.1	17.1	17.5	4.9	2.0	24.5
Moderately	1.7	3.8	7.3	12.8	2.5	6.8	7.0	16.3
Non-poor	1.5	4.1	64.6	70.2	2.4	5.0	51.9	59.2
Total	14.2	11.8	74.0	100.0	22.4	16.7	60.9	100.0

Source: Calculation from Vulnerability survey data

Notes: Extremely refers extremely poor group which includes those who are deprived in 50 percent or more of indicators, moderately refers to moderately poor group which includes those who are deprived in between 33 percent and 50 percent of indicators, non-poor refers to non-poor group which includes those who are deprived in less than 33 percent of indicators.

4 Drivers of the poverty transitions

This section will examine what drive the poverty transitions and why there were such differences between men and women. The poverty transitions during the three year period were attributed mainly to the change in the headcount ratio (incidence of poverty) rather than the change in average deprivations (intensity of poverty). Men not only began from a higher starting point, they made a faster progress in reducing poverty headcount ratio. At a cut-off of 33 percent for instance, only closed to 30 percent of men were poor in 2007 and this ratio reduced significantly to 26 percent by 2010. These numbers were 41 and 39 percent respectively for women, showing a lower starting point and also a slower progress. Additionally, poorer individuals made a slightly slower progress in poverty reduction (in terms of headcount ratio) than their counterparts. This is in line with the literature that argues that the wealthy benefit more from economic growth than the poor (Tran, Alkire and Klasen, 2015).

Moreover, among those who were poor, both men and women still had a relatively high level of poverty intensity. The average deprivations were between 40 to 60 percent depending on the cut-offs and gender. Furthermore, both these two groups had made a relatively slow progress in reducing the average deprivation ratio. They have experience a reduction of only less than 1 percentage point over the three years.

Table 5 Changes in multidimensional measures of poverty

	Headcount ratio				Average deprivation share			
	Men		Women		Men		Women	
Cut-off (%)	Level 2007	Change 07-10	Level 2007	Change 07-10	Level 2007	Change 07-10	Level 2007	Change 07-10
20	38.9	-5.6***	49.5	-3.4**	42.6	0.5	45.6	0.5
25	33.0	-4.0**	43.9	-1.5***	46.2	-0.0	48.6	-0.4*
33	29.8	-3.9***	40.8	-1.7***	48.2	0.2	50.2	-0.2*
50	17.1	-2.9***	24.5	-2.1**	56.7	0.3	58.6	0.0

Source: Calculation from Vulnerability survey data

Notes: 07-10 refers to period 2007 – 2010

The poverty transitions are also the results of the changes in raw headcount ratios. **Error! Reference source not found.** shows raw headcount ratio[2] of all indicators and their changes over time for the men and women groups. It is evident that both men and women made progress in improving the performance of all indicators, except for women's nutrition. Among the nine indicators, three living standard indicators had the poorest performance at the beginning. There were approximately 80 percent of men or women were deprived in each of these indicators. Since these indicators are identified at household level, there was little difference between the two groups. However, these indicators made the greatest progress; the deprivation ratios showed a reduction of more than 10 percent over the three-year period.

[2] The raw headcount ratio refers to the share of the population being deprived in an indicator.

Schooling is also one the important contributors to the multidimensional poverty index (MPI), showing deprivation ratios of closed to 22 percent for men and 34 percent for women. The gap between men and women's performance in education implies that girls still had less chance to go to school than boys. Also, men made a faster progress than women in the performance of this indicator. Health functioning is also an important contributor to the MPI. Every 14 out of 100 men were deprived in health functioning. Interestingly, women performed better than men in this indicator, only slightly above 13 out of 100 women were deprived in health functioning. But men showed a slightly better progress, a reduction of closed to 2 percent over the three years while women made a reduction of less than 1 percent over the same time period. The performance in nutrition is better than living standard, schooling and health functioning indicators. However, men still had better performance than women; only closed to 8 out of 100 men were deprived in nutrition while 15 out of 100 women were deprived in this indicator. Again, men made a better performance over the period but women had worse performance. It is argued in the literature that when a household suffer a shock it might need to cut its expenditure (i.e. food expenditure) as a shock coping strategy and women usually suffer this a bit more seriously than men (Tran, 2015). Therefore the non-improvement in women's performance in nutrition might be the consequence of an economic recession, a high inflation started late 2007 and early 2008 which resulted in higher number of the unemployed, and more frequent and severe natural disasters in 2009 in central provinces of Vietnam (see Tran, 2013, p. 10; Tran, 2015, p. 16).

Table 6 Indicator deprivations and their changes

	Men		Women	
	Level 2007 (percent)	Change 2007-2010 (point percent)	Level 2007 (percent)	Change 2007-2010 (point percent)
Nutrition	7.8	-0.5	15.0	0.1
Health functioning	14.2	-1.9	13.4	-0.8
Schooling	21.5	-0.9	33.8	-0.1
Cooking fuel	82.0	-14.2	82.4	-14.0
Sanitation	78.0	-13.0	79.3	-13.3
Drinking water	80.3	-11.9	80.7	-11.1
Electricity	2.0	-1.0	2.1	-0.8
Housing	6.8	-1.1	7.6	-1.5
Assets	10.8	-5.2	13.8	-5.5

Source: Calculation from Vulnerability survey data

5 Conclusion

This study examines the gender differences in the dynamics of poverty using multidimensional measures of poverty, which is new contribution to the literature. The results from this study show that women still have lower levels of well-being than men do. This suggests that although Vietnam has made efforts to narrow the gender gap, women are still benefit much less than men from economic growth because they have limited access to production inputs, to

markets, and to public services. Also, men have made a much faster progress in reducing poverty than women. Women even have slightly higher risk of falling into poverty. This suggests that women not only benefit less from economic success, they suffer more from shocks.

The results also show that the poverty transitions are driven largely by the improvement in the performance of three living standard indicators of electricity, cooking fuel, and drinking water; health; and schooling. This implies that the women empowerment strategy needs to focus on improving women's educational attainment and health by giving them more chance to go to school, more chance to access to safe drinking water, more chance to be better nourished, and more chance to access to public services.

This study is an important contribution to the literature on multidimensional measurement of poverty, as well as the literature on gender differences in poverty. More importantly, it is one of the first studies that investigate the gender disparity in the poverty dynamics.

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