Chapter 9
Roles of Education in Expenditure Inequality between Urban and Rural Areas: Indonesia, the Philippines, and India

Mitsuhiro Hayashi

Abstract This study selects Indonesia, the Philippines, and India among Asian developing countries and, based on household survey data, examines the determinants of urban–rural disparities in per capita consumption expenditure in these three countries, with a focus on education, using the Blinder–Oaxaca decomposition method. In both Indonesia and India, inequality in per capita consumption expenditure, as measured by the Theil index, tended to expand during the observation period. In the Philippines, inequality in per capita expenditure improved over the period, although the level of inequality still remains high. The share of inequality between urban and rural areas is relatively lower than that of inequality within urban and rural areas, due to the use of the conventional Theil decomposition method. However, the gaps between urban and rural areas are not small enough for their impact to be ignored, when using Elbers' alternative decomposition approach as a supplementary tool for the conventional Theil decomposition method. This study therefore attempts to decompose the differences in mean per capita consumption expenditure between urban and rural areas into several household features, including education, using the Blinder–Oaxaca decomposition method. As a result, in Indonesia, the Philippines, and India, differences in educational endowments appear to have been a key determinant of urban–rural disparity, accounting for approximately 30–60% of the urban–rural expenditure gap. In addition, differences in job sectors (agricultural sector *vs* non-agricultural sector) also contribute to the expenditure gap, albeit to a lesser extent.

Keywords Expenditure inequality between urban and rural areas · Roles of education · Blinder–Oaxaca decomposition method · Indonesia · The Philippines · India

The author is grateful to the Japan Society for the Promotion of Science for its financial support (Grant-in-aid for Scientific Research No. 17K03714 and No. 20K01690). The author is also grateful to Chuo University for its financial support (Grant for Special Research).

M. Hayashi (✉)
Faculty of Economics, Chuo University, Tokyo, Japan
e-mail: mhayashi@tamacc.chuo-u.ac.jp

T. Ishikawa and D. Nakamura (eds.), *Industrial Location and Vitalization of Regional Economy*, https://doi.org/10.1007/978-981-19-8128-9_9

JEL Classification O5 · O8 · R12

9.1 Introduction

Studies on inequality in developing countries have actively been conducted by the World Bank, the Asian Development Bank (ADB), and the United Nations University-World Institute for Development Economics Research (UNU-WIDER); the studies published include that of the World Bank (2005), Ravallion (2016), ADB (2012), Zhuang (2010), and Kanbur and Venables (2005). Most of these studies analyzed inequality in developing economies, based on either cross-country data or aggregate data, which are easy to obtain and process.

However, there are only a limited number of studies on spatial inequality in a certain country—with a focus on location groups (e.g., urban and rural areas)—using time series and nationwide household survey data, which are not easy to obtain and process. Among them are Yusuf et al. (2014), Balisacan and Fuwa (2004), Cain et al. (2008), and Gustafsson et al. (2008).

As distinguished development economists such as Lewis (1954), Harris and Todaro (1970), and Kuznets (1955) pointed out, as the social and economic inequalities observed between urban and rural areas have been very large, it may be a critical challenge for developing countries to solve this problem, from the perspective of ensuring fairness across population groups. ADB (2012) emphasizes that the widening income disparity between urban and rural areas in Asian countries in recent years should be addressed directly. However, even though spatial inequality is such an important issue, this field has not been much studied until recently, due to types of data and/or decomposition methods.

Considering this gap in the research, the current study aims to investigate the spatial socio-economic inequalities in developing countries. This study selects Indonesia, the Philippines, and India as its research target countries, based on the following criteria: (1) these countries each have a large population size, which is helpful for the effective use of research results; (2) these countries have adequate spatial expanses, considering that this is suitable for a spatial analysis; and (3) there is the availability of household survey data, which makes the execution of the study possible. Using time series and nationwide household survey data of these three countries, the study focuses on inequality between urban and rural areas and examines the role of education in urban–rural disparity, with reference to my previous studies such as Hayashi et al. (2014, 2015), and Hayashi and Kalirajan (2018).

Indonesia, the Philippines, and India have achieved steady economic development, with an average annual growth rate—in real GDP per capita—of 3.8%, 2.8%, and 5.1%, respectively, for 2000–2010, despite the outbreak of the Lehman shock. Among Asian countries, Indonesia, the Philippines, and India are large countries, with their populations being approximately 240 million, 94 million, and 1.2 billion, respectively, in 2010.

This study attempts to clarify how much influence education has had on the urban–rural gap in consumption expenditure in each of the above three countries. Specifically, the Blinder–Oaxaca decomposition method is adopted to analyze the impact of various household characteristics—such as the number of family members, gender, age, education, and production sector—on inequality between urban and rural areas, in terms of per capita household consumption expenditure, using nationwide household survey data in the three countries at two-time points.

The remainder of this study is organized as follows. Section 9.2 describes the data and methods used in this study, while Sect. 9.3 gives an overview of urban–rural disparity in Indonesia, the Philippines, and Indonesia. In Sect. 9.4, the role of education in urban–rural inequality is analyzed, using the Blinder–Oaxaca decomposition method. Finally, Sect. 9.5 presents the main findings, along with some policy implications.

9.2 Data and Method

This study explored the determinants of the urban–rural disparity in per capita consumption expenditure in Indonesia, the Philippines, and India, respectively; then, the determinants in those three countries were compared. To accomplish these aims, the study used household survey data of each country, as indicated in Table 9.1, decomposed consumption expenditure data into several determinants, and then compared these determinants.

Considering Indonesia, this study used the *Susenas* (the *Survei Sosial Ekonomi Nasional* or the National Socio–Economic Survey) panel data on expenditure in 2008 and 2010, compiled by the Central Bureau of Statistics in Indonesia (BPS). The *Susenas* panel dataset includes approximately 61,000 households, of which 23,700 are in urban areas and 37,300 are in rural areas. The share of urban households—estimated using sampling weights—was around 47% in 2008, a proportion that remains constant during the study period.[1] To adjust for spatial differences in prices at a point in time and spatial differences in inflation rates, this study converted current price expenditures into expenditures at 2008 constant prices by using current price provincial urban and rural poverty lines in 2008 and 2010.[2]

With regard to the Philippines, we used household data from the Family Income and Expenditure Survey (FIES) in 1997 and 2006, compiled by Philippine Statistics

[1] Sampling weights are used for calculations to adjust overestimation or underestimation of sections of the population.

[2] Cameron (2002) notes that the BPS official figures and most studies in the literature do not control for the regional cost of living differences when calculating inequality figures. According to this work, spatial differences in prices are considered in different official poverty lines used in urban and rural areas by province, although the urban poverty line tends to be inflated, relative to the rural poverty line.

Authority (PSA).[3] The Family Income and Expenditure Survey datasets in those two years include around 38,500–39,600 households, of which 45–60% are in urban areas and 40–55% are in rural areas. To analyze inequality changes in real terms, the study converted current price expenditures into expenditures at 2000 constant prices by using the 2000 consumer price index (CPI) calculated by the PSA.

In the case of India, our study used household consumption expenditure data from the National Sample Survey (NSS), collected and compiled by the National Sample Survey Office (NSSO) under the Indian Ministry of Statistics and Programme Implementation.[4] Specifically, the study used the NSS 55th Round Survey (July 1999–June 2000) and 68th Round Survey (July 2011–June 2012). The NSO datasets in those two rounds include around 102,000 to 120,000 households, of which approximately 40% are in urban areas and 60% are in rural areas. The shares of urban households estimated using sampling weights are roughly 27% in 1999/2000 and 31% in 2011/12.

To adjust for spatial differences in prices at a point in time and spatial differences in inflation rates, the study converted current price expenditures into constant

Table 9.1 Household survey data in Indonesia, The Philippines, and India

	Indonesia	The Philippines	India
Household survey data used in this study	National Socio–Economic Survey (*Susenas*): Panel dataset	Family Income and Expenditure Survey (*FIES*)	National Sample Survey (*NSS*)
Organization responsible for household survey	Statistics Indonesia (BPS)	Philippine Statistics Authority (PSA) (former NSO)	National Sample Survey Office (NSSO)
Years of dataset used in this study	2008 and 2010	1997 and 2006	1999/2000 and 2011/12
Number of households surveyed	Approx. 61,000	Approx. 39,500 (1997)	Approx. 120,000 (1999/2000)
		Approx. 38,500 (2006)	Approx. 102,000 (2011/12)
Share of households (Urban:Rural, %)	Approx. 39:61 (2008, 2010)	Approx. 59:41 (1997)	Approx. 41:59 (1999/2000, 2011/12)
		Approx. 45:55 (2006)	
Deflator and base year	Provincial urban and rural poverty lines	Provincial CPI	Urban and rural poverty lines of each state/union territory
	2008 constant prices	2000 constant prices	2011/12 constant prices

Source Prepared by the author

[3] The Philippine Statistics Authority (PSA) was established in 2013 by integrating the former National Statistics Office (NSO), the National Statistical Coordination Board, Bureau of Agricultural Statistics and Bureau of Labor and Employment Statistic.

[4] As for the history, implementation method and problems of National Sample Survey, see Mukhopadhaya et al. (2011) and Tsujita (2006).

price expenditures by using current price provincial urban and rural poverty lines in 1999/2000 and 2011/12. Based on the poverty line in the urban area of Delhi (National Capital Territory) in 2011/12, per capita household expenditure at 2011/12 constant prices with consideration of spatial differences was calculated and utilized.[5]

To explore the determinants of the urban–rural disparity in mean per capita consumption expenditure, this study used household survey data for the three countries and performed a Blinder–Oaxaca decomposition analysis, which was popularized by Blinder (1973) and Oaxaca (1973).[6]

In the equation below, let Y_U and Y_R be the natural log of per capita expenditure of urban and rural households, respectively. Given the linear regression model,

$$Y_k = \boldsymbol{X}_k{}'\boldsymbol{\beta}_k + e_k \quad E(e_k) = 0 \quad k = U, R$$

where X_k is a vector of explanatory variables, $\boldsymbol{\beta}_k$ includes the parameters associated with $\boldsymbol{X}_k$, and e_k is the error term, which contains unobserved factors. Moreover, we let $\hat{\boldsymbol{\beta}}_k$ be a vector of the least-squares estimates for $\boldsymbol{\beta}_k$ $(k = U, R)$, obtained separately from the urban and rural samples, and $\overline{\boldsymbol{X}}_k$ be the estimate for $E(\boldsymbol{X}_k)$. Then, the estimated urban–rural difference in mean per capita expenditure is expressed as a twofold decomposition:

$$\widehat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}^* + \left(\overline{\boldsymbol{X}}_U{}'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}^*) + \overline{\boldsymbol{X}}_R{}'(\hat{\boldsymbol{\beta}}^* - \hat{\boldsymbol{\beta}}_R)\right)$$

where $\hat{\boldsymbol{\beta}}^*$ is a vector of the least-squares estimates for the slope parameters and the intercept, obtained from the pooled sample of urban and rural households (Neumark, 1988). The first term in the above equation is the part of the urban–rural difference in mean per capita expenditure that is explained by urban–rural differences in the explanatory variables (endowments or quantity effect), and the second term is the unexplained part. Based on the above equation, we decomposed the differences in mean per capita household expenditure between urban and rural areas into several components, including educational differences.

[5] Poverty lines in 2011/12 were calculated using only Tendulkar methodology, while those in 1999/2000 were calculated using only Lakdawala methodology. However, poverty lines in 2004/05 were calculated using both methodologies. Therefore, based on poverty lines in 2011/12, those in 1999/2000 are adjusted by connecting both series in 2004/05. For details on poverty lines in India, see Planning Commission (2014).

[6] For a comprehensive review of the Blinder–Oaxaca decomposition method and its applications, please see Jann (2008).

9.3 Urban–Rural Disparity in Indonesia, the Philippines, and India: Overview

Tables 9.2, 9.4, and 9.6 present figures on mean monthly per capita household expenditure and the shares of population and expenditure in Indonesia, the Philippines, and India, respectively. The data are presented in terms of urban and rural areas and educational attainment and at two-time points. Tables 9.3, 9.5, and 9.7 report the results of urban–rural decomposition of per capita expenditure inequality by using the Theil T, in each of the three countries and at two-time points.

Table 9.2 indicates that, in Indonesia, the mean expenditure per capita in urban areas is 1.7 times higher than in rural areas. While the majority of the country's population resides in rural areas, urban areas occupy a larger share of expenditure, around 60%. In both urban and rural areas, the mean per capita household expenditure increases as the level of education of the household head rises. However, there is a striking contrast between urban and rural areas in terms of educational attainment levels. The proportion of households of which household heads have received higher education is considerably larger in urban areas than in rural areas. More than 40% of rural households are headed by individuals with no schooling or incomplete primary school education.

Table 9.3 presents the results of the urban–rural decomposition of per capita expenditure inequality in Indonesia. These figures indicate an upward trend in inequality in Indonesia as a whole over the period. Inequality within urban and rural areas is more significant than inequality between urban and rural areas, in terms of both value and contribution, as measured by the Theil T. Urban areas have significantly higher within-group inequality than rural areas.

Clearly, between-area inequality is unremarkable, in comparison with within-area inequality. However, an alternative Theil index decomposition proposed by Elbers et al. (Between-area [B′] in Table 9.3) indicates that observed inequality between the two areas accounts for more than 26% of the maximum attainable between-area inequality, given the current distribution of per capita household expenditures, the relative sizes of urban and rural areas, and their ranking in terms of mean per capita expenditure.[7] This implies that the contribution of urban–rural inequality may be larger than we thought it was when using the conventional Theil decomposition approach.

[7] Elbers et al. (2008) propose an alternative measurement approach for the contribution of the between-group inequality component. The between-group component depends on the number of groups, the relative sizes of the groups, and the differences in mean per capita expenditures among the groups. Therefore, care should be taken when comparing decomposition results based on different spatial groupings (Shorrocks and Wan, 2005). Even when the same spatial grouping is used, decomposition results would not be comparable if the relative sizes of the groups are different. To rectify the problem, Elbers et al. (2008) suggest that between-group inequality should be assessed against the maximum between-group inequality attainable, given the number and relative sizes of the groups, rather than against the overall inequality that is used in the conventional approach for the contribution of the between-group inequality component.

Table 9.2 Mean per capita household expenditure and shares of population and expenditure by groups: Indonesia

	2008			2010		
	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)
Urban and rural areas						
Urban	510,191	47.1	60.3	571,949	47.1	60.5
Rural	298,795	52.9	39.7	331,722	52.9	39.5
Total	398,390	100.0	100.0	444,802	100.0	100.0
Educational attainment in urban and rural areas[b]						
Urban						
No education	330,823	20.5	13.3	372,462	20.5	13.4
Primary	384,322	22.8	17.2	428,090	23.5	17.6
Lower secondary	462,898	15.2	13.7	501,139	15.1	13.2
Upper secondary	585,135	30.3	34.8	663,559	29.9	34.6
Tertiary	956,729	11.2	21.0	1,097,547	11.0	21.2
Total	510,191	100.0	100.0	571,949	100.0	100.0
Rural						
No education	258,143	41.6	36.0	286,206	40.4	34.8
Primary	284,482	33.3	31.7	312,083	34.5	32.5
Lower secondary	328,159	11.5	12.6	365,641	11.5	12.7
Upper secondary	402,351	10.9	14.6	448,411	10.8	14.5
Tertiary	557,075	2.7	5.1	637,377	2.8	5.5
Total	298,795	100.0	100.0	331,722	100.0	100.0

Notes [a]The average monthly per capita household consumption expenditure for each group at 2008 constant prices (Indonesian Rupiah)
[b]Classified based on educational attainment level of household head
Source Calculated based on *Susenas* 2008 and 2010

In the Philippines, as shown in Table 9.4, urban areas have higher mean household expenditure per capita than rural areas, in both 1997 and 2006. These numbers suggest a reduction in urban–rural inequality in mean expenditure per capita during the ten-year period; however, the mean expenditure per capita in urban areas is more than twice as large as in rural areas in 2006. While more than half of the country's population resides in rural areas, urban areas account for around two-thirds of consumption

Table 9.3 Inequality decomposition by urban and rural areas: Indonesia

	2008			2010		
	Theil *T*		Gini	Theil *T*		Gini
	Value	Contribution (%)[a]		Value	Contribution (%)[a]	
Urban and rural areas						
Urban	0.242	57.8	0.361	0.264	60.0	0.377
Rural	0.180	28.3	0.300	0.177	26.3	0.313
Within-area (A)	0.218	86.1		0.230	86.3	
Between-area (B)[b]	0.035	13.9		0.036	13.7	
Total (C) = (A) + (B)	0.253	100.0	0.362	0.266	100.0	0.376
Between-area (B′)[c]	0.035	28.5		0.036	26.8	
Max between-area[d]	0.123	100.0		0.136	100.0	

Notes [a]The percentage contribution of each inequality component to overall inequality
[b]Between-area inequality is assessed by using a conventional approach (see note 7)
[c]Between-area inequality is assessed by using an alternative approach (see note 7)
[d]This is obtained as the maximum between-area inequality attainable, given the numbers and relative sizes of the groups (see text in note 7)
Source Calculated based on *Susenas* 2008 and 2010

expenditure. Mean expenditure per capita increases monotonically with the education attainment of the household heads in both urban and rural areas. However, the educational attainment level of household heads is very different between urban and rural areas. The proportion of households of which the household heads have received higher education is significantly larger in urban areas than in rural areas.

In Table 9.5, it is shown that, over the study period, inequality in terms of mean expenditure per capita in the Philippines has improved, as a whole; however, it still remained at a high level. Inequality within urban and rural areas is more significant than inequality between urban and rural areas, judging from both value and contribution measured by the Theil *T*. Looking within urban and rural areas, urban inequality is considerably higher than rural inequality.

Urban–rural inequality accounts for slightly <20% of overall inequality. When using the alternative Theil index decomposition method, inequality between urban and rural areas can explain around 40% of overall inequality. This suggests that urban–rural inequality in the Philippines is severe.

Table 9.6 illustrates the mean per capita household expenditures and the shares of population and expenditure in India in 1999/2000 and 2011/12. Urban areas have higher mean expenditure per capita than rural areas. The shares of population and expenditure are larger in rural areas than in urban areas. Although the center of the country—in terms of the size and share of population—is still in rural areas, the shares of population and consumption expenditure have been shifting from rural to urban areas over the period. This implies the advancement of dynamic urbanization and the expansion of inequality between urban and rural areas in India.

Table 9.4 Mean per capita household expenditure and shares of population and expenditure by groups: The Philippines

	1997			2006		
	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)
Urban and rural areas						
Urban	31,248	47.6	67.9	48,535	49.6	67.8
Rural	13,417	52.4	32.1	22,633	50.4	32.2
Total	21,898	100.0	100.0	35,477	100.0	100.0
Educational attainment in urban and rural areas[b]						
Urban						
No education	17,167	15.6	8.6	27,607	14.2	8.0
Primary	19,602	18.5	11.6	30,676	14.1	8.9
Lower secondary	21,170	11.3	7.6	33,836	12.2	8.5
Upper secondary	30,844	39.8	39.3	47,764	43.4	42.8
Tertiary	69,510	14.8	32.9	95,837	16.1	31.8
Total	31,248	100.0	100.0	48,535	100.0	100.0
Rural						
No education	10,736	38.3	30.7	16,510	35.1	25.6
Primary	12,140	27.9	25.2	19,271	23.5	20.1
Lower secondary	12,729	10.8	10.2	20,817	12.5	11.5
Upper secondary	17,243	19.5	25.1	28,079	23.9	29.6
Tertiary	33,620	3.5	8.8	60,158	5.0	13.2
Total	13,417	100.0	100.0	22,633	100.0	100.0

Notes [a]The average monthly per capita household consumption expenditure for each group at 2000 constant prices (Philippine Peso)
[b]Classified based on educational attainment level of household head
Source Calculated based on *FIES* 1997 and 2006

The mean per capita household expenditure increases monotonically with the education of the household heads in both urban and rural areas. However, the mean per capita household expenditure is higher in urban areas than in rural areas, even at the same educational attainment level; this tendency can be clearly seen in groups of higher-educated people. Furthermore, the proportion of households in which household heads have received higher education is considerably larger in urban areas than in rural areas.

Table 9.5 Inequality decomposition by urban and rural areas: The Philippines

	1997			2006		
	Theil *T*		Gini	Theil *T*		Gini
	Value	Contribution (%)[a]		Value	Contribution (%)[a]	
Urban and rural areas						
Urban	0.453	65.0	0.456	0.343	59.5	0.427
Rural	0.253	17.2	0.368	0.281	23.1	0.387
Within-area (A)	0.389	82.2		0.323	82.6	
Between-area (B)[b]	0.084	17.8		0.068	17.4	
Total (C) = (A) + (B)	0.473	100.0	0.470	0.391	100.0	0.455
Between-area (B′)[c]	0.084	40.2		0.068	37.5	
Max Between-area[d]	0.209	100.0		0.182	100.0	

Notes [a]The percentage contribution of each inequality component to overall inequality
[b]Between-area inequality is assessed by using a conventional approach (see note 7)
[c]Between-area inequality is assessed by using an alternative approach (see note 7)
[d]This is obtained as the maximum between-area inequality attainable, given the numbers and relative sizes of the groups (see note 7)
Source Calculated based on *FIES* 1997 and 2006

Table 9.7 presents the results of the urban–rural decomposition of per capita expenditure inequality in India in 1999/2000 and 2011/12. These figures show an upward trend of inequality in India as a whole during the period. In India, similar to the other two countries, inequality within urban and rural areas is more salient than inequality between urban and rural areas, in terms of both value and contribution, as measured by the Theil *T*. Moreover, urban areas have higher within-group inequality than rural areas.

During the observation period, the value of between-area inequality rose to 0.035, and its contribution to total inequality increased to 14%, as measured by the Theil *T*. In addition, an alternative decomposition measure indicates that inequality between urban and rural areas accounts for nearly a quarter of the maximum attainable between-area inequality in 2011/12. India should therefore address inequality between urban and rural areas urgently.

As described earlier, urban areas have higher mean household expenditures per capita than rural areas in all three countries. While the centers of the three countries in terms of population are still on rural areas, population and consumption expenditure have been flowing into urban areas.

Common in these three countries, in both urban and rural areas, mean per capita household expenditure increased as the level of education attained by household heads rose. However, mean per capita household expenditure was shown to be higher in urban areas than in rural areas, even in the same educational attainment level; this tendency becomes clear in the groups of higher-educated people. Additionally, the

Table 9.6 Mean per capita household expenditure and shares of population and expenditure by groups: India

	1999/2000			2011/12		
	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)	Mean per capita expenditure[a]	Population share (%)	Expenditure share (%)
Urban and rural areas						
Urban	2,236	27.2	36.9	3,205	31.3	43.8
Rural	1,430	72.8	63.1	1,873	68.7	56.2
Total	1,649	100.0	100.0	2,290	100.0	100.0
Educational attainment in urban and rural areas[b]						
Urban						
No education	1,524	31.6	21.6	1,890	23.7	14.0
Primary	1,764	11.6	9.1	2,261	10.8	7.6
Lower secondary	1,897	14.2	12.0	2,469	14.5	11.1
Upper secondary	2,534	26.0	29.5	3,414	30.4	32.4
Tertiary	3,740	16.6	27.8	5,421	20.6	34.9
Total	2,236	100.0	100.0	3,205	100.0	100.0
Rural						
No education	1,271	65.1	57.9	1,610	52.7	45.2
Primary	1,486	11.4	11.8	1,802	13.2	12.7
Lower secondary	1,605	11.1	12.5	1,982	15.1	16.0
Upper secondary	1,946	9.9	13.5	2,390	15.4	19.7
Tertiary	2,456	2.5	4.3	3,292	3.6	6.4
Total	1,430	100.0	100.0	1,873	100.0	100.0

Notes [a]The average monthly per capita household consumption expenditure for each group at 2011/12 constant prices (Indian Rupee)
[b]Classified based on educational attainment level of household head
Source Calculated based on *NSS* 1999/2000 and 2011/12

proportion of households in which household heads had received higher education is larger in urban areas than in rural areas.

As measured by the Theil T, in Indonesia and India, the overall inequality in terms of per capita household expenditure increased between two-time points. In the Philippines, inequality in mean expenditure per capita was slightly reduced, although it still remained at a high level. When using the conventional Theil index decomposition method, the share of inequality between urban and rural areas was shown to be

Table 9.7 Inequality decomposition by urban and rural areas: India

	1999/2000			2011/12		
	Theil *T*		Gini	Theil *T*		Gini
	Value	Contribution (%)[a]		Value	Contribution (%)[a]	
Urban and rural areas						
Urban	0.258	46.4	0.354	0.275	49.0	0.385
Rural	0.139	42.7	0.270	0.162	37.0	0.285
Within-area (A)	0.183	89.1		0.211	86.0	
Between-area (B)[b]	0.022	10.9		0.035	14.0	
Total (C) = (A) + (B)	0.205	100.0	0.317	0.246	100.0	0.351
Between-area (B′)[c]	0.022	19.2		0.035	24.0	
Max Between-area[d]	0.116	100.0		0.143	100.0	

Notes [a]The percentage contribution of each inequality component to overall inequality
[b]Between-area inequality is assessed by using a conventional approach (see note 7)
[c]Between-area inequality is assessed by using an alternative approach (see note 7)
[d]This is obtained as the maximum between-area inequality attainable, given the numbers and relative sizes of the groups (see note 7)
Source Calculated based on *NSS* 1999/2000 and 2011/12

relatively lower than that of inequality within urban and rural areas. However, when using the alternative Theil index decomposition, the share of inequality between urban and rural areas increased substantially in Indonesia, the Philippines, and India.

This suggests that the gaps between urban and rural areas are not necessarily small enough for their impact to be ignored. Our study focuses on and examines the role of educational differences in urban–rural inequality in these three countries.

9.4 Accounting for Urban–Rural Disparity in Indonesia, the Philippines, and India: The Blinder–Oaxaca Decomposition Method

The preceding section provides an overview of the urban–rural inequality in consumption expenditure in each of the three countries. Previous studies on inequality in Asian economies point out that household income or expenditure disparities are generated by unequal access to education.[8] The current section thus analyzes the

[8] Studies that associate inequality with household features, including education are, for example, ADB (2007, 2012), and OECD (2011).

degree of impact of various household characteristics, including differences in educational attainment on urban–rural inequality in per capita consumption expenditure, using the Blinder–Oaxaca decomposition method.

Specifically, we decomposed differences in mean per capita household expenditure between urban and rural areas into the following common components of household features, as the determinants of the urban–rural inequality in each of the three countries:

(i) household size;
(ii) gender of household head (female = 0; male = 1);
(iii) age of household head;
(iv) squared age of household head;
(v) years of education of household head; and
(vi) job sector of household head (agriculture/mining = 0; non-agriculture/mining = 1).

Note that variable (v), the number of years of education, is calculated according to the following, in each of the three countries.

In Indonesia, household heads' years of education are calculated as (1) no schooling (0 years); (2) incomplete primary school (3 years); (3) general and Islamic primary schools (6 years); (4) general and Islamic junior high schools (9 years); (5) general, Islamic, and vocational senior high schools (12 years); (6) diploma I and II (13 years); (7) diploma III (15 years); (8) diploma IV (bachelor's degree) (16 years); and (9) master's or doctoral degree (18 years).

In case of the Philippines, the length of education is calculated as (1) no schooling (0 years); (2) incomplete elementary education (3 years); (3) elementary education (6 years); (4) incomplete secondary education (8 years); (5) secondary education (10 years); (6) incomplete tertiary education (12 years); and (7) tertiary education including postgraduate education (14 years).

As for India, based on Cain et al. (2008), the number of years of education is calculated in the following way: (1) illiterate (0 years); (2) literate through non-formal schooling (i.e., NFEC [Non-formal Education Courses], ALC [Adult Literacy Centers], EGS [Education Guarantee Scheme], TLC [Total Literacy Campaign], and [other]) (1 year); (3) literate, but incomplete primary education (3 years); (4) primary education (5 years); (5) middle schools/lower secondary education (8 years); (6) secondary education (10 years); (7) higher secondary education (12 years); (8) diploma/certificate courses (12 years); (9) undergraduate education (15 years); and (10) postgraduate education (17 years). For details on the education system in India, refer to National Sample Survey Office (2015).

Tables 9.8, 9.9, and 9.10 indicate the results of the Blinder–Oaxaca decomposition of urban–rural differences in mean per capita expenditure in Indonesia, the Philippines, and India, respectively, at two-time points.

Table 9.8 shows that, in Indonesia, the mean of the natural log of per capita expenditure in 2008 is 12.973 for urban households and 12.482 for rural households,

Table 9.8 Blinder–Oaxaca decomposition of urban–rural differences in Mean per capita household consumption expenditure: Indonesia[a]

	2008			2010		
	Coefficient	Standard errors	Contribution (%)[b]	Coefficient	Standard errors	Contribution (%)[b]
Prediction (urban)	12.973	0.004		13.071	0.004	
Prediction (rural)	12.482	0.003		12.574	0.003	
Difference (urban–rural)	0.492	0.005	100.0	0.496	0.005	100.0
Explained	0.226	0.003	46.0	0.239	0.004	48.2
Household size	−0.008	0.001	−1.7	−0.012	0.001	−2.4
Gender of household head	0.000	0.000	0.0	0.000	0.000	0.0
Age of household head	−0.017	0.003	−3.5	−0.007	0.003	−1.4
Square of age of household head	0.015	0.002	3.0	0.008	0.003	1.6
Years of education of household head	0.175	0.003	35.5	0.181	0.003	36.5
Household job sector (agriculture vs. non–agriculture)	0.062	0.002	12.7	0.069	0.002	13.9
Unexplained	0.265	0.005	54.0	0.257	0.005	51.8

Notes [a]The Blinder–Oaxaca decomposition technique used here is a twofold decomposition method
[b]The percentage contribution of each factor to the urban–rural expenditure gap
Source Calculated based on *Susenas* 2008 and 2010

yielding an urban–rural expenditure gap of 0.492. The same figures for 2010 are almost at the same level. The Blinder–Oaxaca decomposition method can divide this expenditure gap into two parts. The first part—that is, the explained part (endowments or quantity effect)—reflects the increase in mean per capita expenditure if rural households had the same endowments as urban households, assuming that urban and rural households have the same coefficients, obtained from the pooled sample of urban and rural households. The second part is a residual or unexplained part that captures all potential effects of differences in unobserved variables. In the table, the increases of 0.226 in 2008 and 0.239 in 2010 indicate that differences in endowments

Table 9.9 Blinder–oaxaca decomposition of urban–rural differences in Mean per capita household consumption expenditure: The Philippines[a]

	1997			2006		
	Coefficient	Standard errors	Contribution (%)[b]	Coefficient	Standard errors	Contribution (%)[b]
Prediction (urban)	9.896	0.005		10.445	0.006	
Prediction (rural)	9.278	0.005		9.768	0.004	
Difference (urban–rural)	0.617	0.007	100.0	0.676	0.007	100.0
Explained	0.341	0.005	55.2	0.322	0.005	47.6
Household size	0.003	0.002	0.5	0.008	0.003	1.2
Gender of household head	0.003	0.001	0.4	0.005	0.001	0.7
Age of household head	0.000	0.005	0.0	−0.014	0.003	−2.1
Square of age of household head	0.002	0.003	0.3	0.009	0.002	1.3
Years of education of household head	0.201	0.004	32.6	0.206	0.004	30.4
Household job sector (agriculture vs. non–agriculture)	0.132	0.003	21.4	0.109	0.003	16.1
Unexplained	0.276	0.007	44.8	0.354	0.006	52.4

Notes [a]The Blinder–Oaxaca decomposition technique used here is a twofold decomposition method
[b]The percentage contribution of each factor to the urban–rural expenditure gap
Source Calculated based on *FIES* 1997 and 2006

(household size, gender, age, education, and job sector) as a whole account for 46% and 48%, respectively, of the urban–rural expenditure gap.[9]

[9] The estimated urban–rural difference in mean per capita expenditure can also be decomposed into the three terms, as follows (threefold decomposition):

$$\widehat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}_R + \overline{\boldsymbol{X}}_R{}'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) + (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) \text{ or}$$
$$\widehat{D} = \overline{Y}_U - \overline{Y}_R = (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'\hat{\boldsymbol{\beta}}_U + \overline{\boldsymbol{X}}_U{}'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R) + (\overline{\boldsymbol{X}}_U - \overline{\boldsymbol{X}}_R)'(\hat{\boldsymbol{\beta}}_U - \hat{\boldsymbol{\beta}}_R)$$

The first term reflects the mean increase in rural households' per capita expenditures if they had the same characteristics as urban households (endowments effect), while the second term represents the increase in rural households' per capita expenditures when applying the urban households' coefficients to the rural households' characteristics. The third component is the interaction term. Differences in endowments as a whole account for 37% of the urban–rural expenditure gap, while differences in coefficients account for 39%, in 2008. As shown in the results, based on the twofold

Table 9.10 Blinder–Oaxaca decomposition of urban–rural differences in Mean per capita household consumption expenditure: India[a]

	1999/2000			2011/12		
	Coefficient	Standard errors	Contribution (%)[b]	Coefficient	Standard errors	Contribution (%)[b]
Prediction (urban)	7.535	0.003		7.748	0.003	
Prediction (rural)	7.203	0.002		7.508	0.002	
Difference (urban–rural)	0.332	0.003	100.0	0.240	0.004	100.0
Explained	0.262	0.003	79.0	0.164	0.002	68.4
Household size	0.042	0.001	12.5	0.044	0.001	18.3
Gender of household head	0.000	0.000	0.1	0.001	0.000	0.3
Age of household head	−0.010	0.001	−3.1	−0.008	0.001	−3.1
Square of age of household head	0.001	0.001	0.3	0.000	0.001	0.1
Years of education of household head	0.195	0.002	58.6	0.128	0.002	53.6
Household job sector (agriculture vs. non–agriculture)	0.035	0.002	10.6	−0.002	0.001	−0.8
Unexplained	0.070	0.003	21.0	0.076	0.003	31.6

Note [a]The Blinder–Oaxaca decomposition technique used here is a twofold decomposition method
[b]The percentage contribution of each factor to the urban–rural expenditure gap
Source Calculated based on *NSS* 1999/2000 and 2011/12

In the explained part, the components related to household size, gender, and age have only a marginal effect. The most significant component is education, followed by the job sector component. Educational attainment differences measured by the length of education of the household head are the largest contributor to differences in mean per capita expenditure between urban and rural areas. This education component accounts for approximately 36% of the urban–rural expenditure gap. Differences in the job sector also explain 13–14% of the gap. Non-agricultural jobs or off-farm opportunities in rural areas would have an effect on reducing the gap between urban and rural areas. This result suggests that urban–rural disparity is largely associated with educational attainments and job sectors.

decomposition, differences in educational attainment and job type play an important role in the urban–rural expenditure gap. In the cases of the Philippines and India, similar results are obtained when using the threefold decomposition.

Table 9.9 exhibits the results of the decomposition of urban–rural differences in mean per capita household expenditure in the Philippines. The mean of the natural log of per capita expenditure in 1997 is 9.896 for urban households and 9.278 for rural households, yielding an urban–rural expenditure gap of 0.617. These levels in 2006 are not much different from those in 1997. The increases of 0.341 in 1997 and 0.322 in 2006 show that differences in endowments (household size, gender, age, education, and job sector) as a whole account for 55% and 48%, respectively, of the urban–rural expenditure gap.

In the Philippines, similar to Indonesia, the components associated with household size, gender, and age do not play a prominent role in the explained part. Most noticeable is the education attainment component, followed by the job sector component. Educational differences have the largest influence on differences in mean per capita household expenditure between urban and rural areas. This education attainment component accounts for approximately 30–33% of the urban–rural expenditure gap. Differences in the job sector also explain around 16–21% of the gap. This result implies that educational attainments and job sectors have a large impact on urban–rural disparity in the Philippines.

According to Table 9.10, the mean of the natural log of per capita expenditure in India in 1999/2000 is 7.535 for urban households and 7.203 for rural households; these yield an urban–rural expenditure gap of 0.332. Likewise, those in 2011/12 are 7.748 for urban households and 7.508 for rural households, yielding an urban–rural expenditure gap of 0.240. The increases of 0.262 in 1999/2000 and 0.164 in 2011/12 demonstrate that differences in endowments (household size, gender, age, education, and job sector) as a whole account for around 79% and 68%, respectively, of the urban–rural expenditure gap.

In India, while the gender and age components do not play a major role in the explained part, the education component is the most influential. Similar to the other two countries, educational differences are the primary factor of differences in mean per capita expenditure between urban and rural areas. This education component accounts for approximately 54–59% of the urban–rural expenditure gap. Next to the education component, the household size and job sector component have a large effect on urban–rural inequality in India. However, the contribution of the job sector to the urban–rural expenditure gap decreases markedly in 2011/12. This change could also be explained by a recent increase in non-agricultural jobs and off-farm business opportunities in rural areas.

The results of the analyses of the three countries using the Blinder–Oaxaca decomposition method suggest that the household components of educational attainments and job sectors make a large contribution to differences in per capita consumption expenditure between urban and rural areas.

9.5 Conclusions

This study selects Indonesia, the Philippines, and India among Asian developing countries and, based on household survey data, examines the determinants of urban–rural disparities in per capita consumption expenditure in these three countries, with a focus on education, using the Blinder–Oaxaca decomposition method. The results of the analysis and the implications drawn from them are summarized as follows.

Indonesia, the Philippines, and India have achieved steady economic development, with an average annual growth rate in real GDP per capita of 3.8%, 2.8%, and 5.1%, respectively, between 2000 and 2010. Among Asian countries, Indonesia, the Philippines, and India are large countries, with populations in 2010 of approximately 240 million, 94 million, and 1.2 billion, respectively.

In all three countries, urban areas have higher mean per capita consumption expenditure than rural areas. Moreover, the shares of population and consumption expenditure tend to shift from rural to urban areas over the period. Common in all three countries, the mean per capita household consumption expenditure increased monotonically with the education attainment of the household heads in both urban and rural areas. However, the proportion of households of which household heads had received higher education is considerably larger in urban areas than in rural areas.

In both Indonesia and India, inequality in per capita consumption expenditure, as measured by the Theil index, tended to expand during the observation period. In the Philippines, inequality in per capita expenditure improved over the period, although the level of inequality still remains high. The share of inequality between urban and rural areas is relatively lower than that of inequality within urban and rural areas, due to the use of the conventional Theil decomposition method. However, the gaps between urban and rural areas are not small enough for their impact to be ignored. Furthermore, when using Elbers' alternative decomposition approach as a supplementary tool for the conventional Theil decomposition method, the share of inequality between urban and rural areas increased substantially, in all three countries.

This study therefore attempts to decompose the differences in mean per capita consumption expenditure between urban and rural areas into several household features, including education, using the Blinder–Oaxaca decomposition method. As a result, in Indonesia, the Philippines, and India, differences in educational endowments appear to have been a key determinant of urban–rural disparity, accounting for approximately 30–60% of the urban–rural expenditure gap.

In addition, differences in job sectors (agricultural sector vs. non-agricultural sector) also contribute to the expenditure gap, albeit to a lesser extent. As indicated in Tables 9.2, 9.4, and 9.6, in these three countries, while the proportion of households of which the household heads have completed tertiary education is about 10–20% in urban areas, it is merely around 2–5% in rural areas. In rural areas, the share of the population engaged in agriculture—an industry with low productivity and high risks—is large. It can be assumed that the differences between urban and rural areas in terms of access to education and employment opportunities in industries with high

productivity and value added would become a major factor, causing the urban–rural disparity in household consumption expenditure.

As countermeasures, it seems that the expansion of education in quantity, improvement in agricultural productivity, and the creation of employment opportunities in non-agricultural sector could contribute to the reduction of urban–rural disparity in per capita consumption expenditure in Indonesia, the Philippines, and India. An important issue would be whether these three countries, in which more than 40% of household heads in rural areas have not received primary education and agriculture sector with low productivity is a key industry, can expand the provision of education services to people in rural areas, create educational opportunities for them through social policy tools—such as a conditional cash transfer program—and enhance their income-earning capacity in either the agricultural or non-agricultural sectors.

References

Asian Development Bank (ADB). (2007). *Key Indicators 2007*, Manila: Asian Development Bank.

Asian Development Bank (ADB). (2012). *Asian Development Outlook 2012: Confronting Rising Inequality in Asia*, Manila: Asian Development Bank.

Balisacan, A.M., & Fuwa, N. (2004). *Changes in spatial income inequality in the Philippines: An exploratory analysis*, WIDER Research Paper No. 2004/34, Helsinki: United Nations University-World Institute for Development Economics Research (UNU-WIDER).

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *J. Human Resourc., 8*, 436–455.

Cain, J.S., Hasan, R., Magsombol, R., & Tandon, A. (2008). *Accounting for inequality in India: Evidence from household expenditures*. ERD Working Paper Series No. 117, Manila: Asian Development Bank.

Cameron, L. A. (2002) Growth with or without equity? The distributional impact of Indonesian development. *Asian-Pacific Economic Literature, 16*(2), 1–17.

Elbers, C., et al. (2008). Reinterpreting between-group inequality. *Journal of Economic Inequality, 6*(3), 231–245.

Gustafsson, B., Shi, L., & Sicular, T. (Eds.). (2008). *Inequality and public policy in China.* New York: Cambridge University Press.

Harris, J., & Todaro, M. (1970). Migration, unemployment and development: A two-sector analysis. *American Economic Review, 60*(1), 126–142.

Hayashi, M., Kataoka, M., & Akita, T. (2014). Expenditure inequality in Indonesia, 2008–2010: A spatial decomposition analysis and the role of education. *Asian Economic Journal, 28*(4), 389–411.

Hayashi, M., Akita, T., Kataoka, M., Centeno, J.R. (2015). Education and expenditure inequality in the Philippines: Decomposition analyses. In *Proceedings for the 5th IRSA (Indonesian Regional Science Association) International Conference*, Bali, Indonesia.

Hayashi, M., & Kalirajan, K. (2018). Spatial dimensions of expenditure inequality in India: With attention to the roles of education and social classes. InT. Ishikawa (Ed.), *Locational analysis of firms' activities from a strategic perspective*, Singapore: Springer.

Jann, B. (2008). The Blinder-Oaxaca decomposition for linear regression models. *The STATA Journal, 8*, 453–479.

Kanbur, R., & Venables, A. J. (Eds.). (2005). *Spatial inequality and development*. New York: Oxford University Press.

Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review, 45*(1), 1–28.
Lewis, W. A. (1954). Economic development with unlimited supplies of labor. *The Manchester School, 22*(2), 139–191.
Mukhopadhaya, P., Shantakumar, G., & Rao, B. (2011). *Economic growth and income inequality in China, India and Singapore: Trends and policy implications*. Oxford, UK: Routledge.
National Sample Survey Office (NSSO). (2015). *Status of education and vocational training in India: NSS 68th round*. Ministry of Statistics and Programme Implementation, Government of India. Retrieved March 30, 2017, from http://mospi.nic.in/sites/default/files/publication_reports/nss_report_no_566_21sep15.pdf.
Neumark, D. (1988). Employers' discriminatory behavior and the estimation of wage discrimination. *Journal of Human Resources, 23*(3), 279–295.
Oaxaca, R. (1973). Male-female "Wage Differentials in Urban Labor Markets." *International Economic Review, 14*, 693–709.
OECD. (2011). *Divided We stand: Why inequality keeps rising*. Paris: OECD.
Planning Commission. (2014). *Report of the expert group to review the methodology for measurement of poverty*. Government of India. Retrieved February 25, 2017, from http://planningcommission.nic.in/reports/genrep/pov_rep0707.pdf.
Ravallion, M. (2016). *The economics of poverty*. New York: Oxford University Press.
Shorrocks, A., & Wan, G. (2005). Spatial decomposition of inequality. *Journal of Economic Geography, 5*, 59–81.
Tsujita, Y. (2006). Hinkon Sakugen Program no Genjyo to Kadai (Current Situation and Challenges in Poverty Reduction Program). In S. Uchikawa (Ed.), *Yakudo suru India Keizai: Hikari to Kage* (Dynamic Economy in India: Light and Shade), Tokyo: IDE-JETRO.
World Bank. (2005). *World Development Report 2006: Equity and development*. New York: Oxford University Press.
Yusuf, A. A., Sumner, A., & Rum, I. A. (2014). Twenty years of expenditure inequality in Indonesia, 1993–2013. *Bulletin of Indonesian Economic Studies, 50*(2), 243–254.
Zhuang, J. (Ed.). (2010). *Poverty, inequality, and inclusive growth in Asia: Measurement, policy issues, and country studies*. London: Anthem Press.