Income Polarization in Asia
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Abstract
The subject of this study is income polarization, an important but neglected dimension of income distribution. Estimates of two measures of income polarization are obtained for the population, rural, and urban sectors using household survey data on expenditures per capita for a sample of Asian countries. The findings include the following: Polarization and inequality, the latter measured using the Gini coefficient, are highly positively correlated; in most countries, urban polarization is higher than rural polarization; higher rates of growth in GDP and per capita GDP, higher levels of educational attainment of household heads, and high rates of employment in manufacturing may be very important in keeping income polarization at low levels.

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1 Introduction

Developing Asia’s record of poverty reduction in the last two decades has been the fastest in any region in the world at any time in history. However, the forces that have driven growth and this dramatic and rapid reduction in poverty—globalization, technological change, and market-oriented reform—have evidently also driven rising inequality. Today, the majority of developing Asia’s population live in countries with rising inequality not only in income levels but, more importantly, in the unequal access to opportunity to build human capital. With globalization, such unequal access is seen to have given rise to widening skills premium and rising wage and income inequality, under conditions of skill-biased technological change in Asia’s advanced economies and ongoing structural transformation in Asia’s developing economies. The focus on inequality is understandable given evidence that high and rising levels of inequality produce far less poverty reduction for a given level of economic growth.

An important but neglected dimension of income distribution is polarization in society, which is the subject of this study. On its own and distinct from inequality, polarization has important implications for the equality of opportunity and the ability of individuals to move up in a society. For example, it is more difficult and probably less likely that individuals living at the lower end of the income strata could move up in a highly polarized society than would be the case otherwise.

Governments have also become concerned about the lack of social cohesion in polarized societies as this could undermine political stability, the sustainability of growth, and the pace of progress in reducing poverty. By preventing a political consensus from being reached, social tension or conflict could diminish the public provision of goods and reduce economic growth and social welfare. Government concerns about social cohesion are reflected in national development plans that mention, for example, “building a harmonious society” in the People’s Republic China’s Eleventh Five-Year Plan, “a growth process that yields broad-based benefits and ensures equality of opportunity for all” in India’s Eleventh Five-Year Development Plan 2007-2012; “inclusive and just development in Indonesia’s 2010-2014 Development Plan”; and the “vision of inclusive growth” in the Philippine Development Plan 2011-2016.

Inequality and polarization are different, albeit related, distributional concepts. Income inequality is about the appropriation of income by a few individuals in society whereas polarization describes “a situation of a divided society.” A society can have a highly unequal income distribution but not be polarized. An extreme example of this is the case where one individual appropriates all the income in society, and n-1 individuals have the same income-zero. Such a society has a perfectly unequal distribution of income but is not one that is polarized.

3 See Ravallion, 2001, for example.
7 This example is from Milanovic, 2000, p. 2.
While inequality is concerned with the distance of different individuals in society from the population mean, polarization is concerned with group formation based on similarities among members in a group. Identification with a particular group leads to group formation, but this process also tends to differentiate and thus alienate such a group from other groups. Hence, polarization is about the process of individuals clustering into a number of distinct socio-economic sub-groups, as well as the distance of individuals from local means within each subgroup. The existence of a small number of distinct sub-groups, each with a large membership, is described as a polarized environment and is assumed to be more prone to conflict.\(^8\)

This study first presents a set of statistics that measures the degree of income polarization in Asia. While there are many studies on inequality in Asia, this study is only one of two on income polarization for a group of countries in Asia that the authors are aware of.\(^9\) Duclos, Esteban, and Ray [DER] (2004) conducted a similar study for Latin American and OECD countries while Milanovic (2000) estimated income polarization for a few Eastern European countries.

The level of income polarization is estimated using two different indexes of polarization, namely, the Foster-Wolfson (1992) index and the DER (2004) index.\(^10\) The primary grouping variable of interest in this paper is income, measured as expenditures per capita. Income polarization estimates for the population, urban, and rural sectors are obtained.

The relationship between income polarization and income inequality is examined next, as is that between polarization and growth, to see whether inequality and economic growth each have a stylized relationship with polarization in the different Asian countries. Finally, the relationship of a variety of variables usually regarded as drivers of income inequality to income polarization is examined.

Available household survey data from national sources for a sample of Asian countries namely, the Philippines, India, Indonesia, Pakistan, Sri Lanka, Bangladesh, and Viet Nam for various years are used in the study.\(^11\)

The study is divided into the following sections: Section 2 gives a brief discussion of the concepts of polarization and its alternative measures, the conceptual distinction between polarization and inequality; Section 3 reports on the trends in polarization for the selected Asian countries; Section 4 examines the correlation relationship between polarization and inequality, polarization and growth, as well as a variety of variables typically associated with inequality; and Section 5 concludes.

### 2 Concepts and Measures of Income Polarization

Polarization is about the process of group formation, specifically, the appearance or disappearance of distinct sub-groups in a distribution.\(^12\) The concept of polarization rests on the notion that while individuals differ in certain characteristics, homogenous sub-groups could

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\(^{8}\) Gasparini et al., 2008, p.461.

\(^{9}\) The other is IMF (2006). Only the Wolfson (1994) measure of income polarization is used in this study. In any case, the empirical work in this study appears to focus on explaining income inequality rather than polarization. Zhang and Kanbur’s (2001) study uses their own measure and estimates income polarization in the People’s Republic of China.

\(^{10}\) The study uses the Distributive Analysis Stata Package (DASP) developed by Araar and Duclos (2012) to compute the various polarization and inequality measures.

\(^{11}\) The People’s Republic of China was excluded due to the paucity of reliable data. Wang and Woo’s (2011) study of the size and distribution of household income in the People’s Republic of China, for example, shows major underreporting of household income especially by the upper income groups.

exist, where certain individuals perceive a degree of likeness within each subgroup. It has been observed, for example, that some individuals in a society share a common trait such as race, income, education, or religion etc., which leads to the formation of groups that are internally homogenous but which are clearly and increasingly distinct from other groups.

Horenstein and Olivieri (2004) describe polarization as the case where population subgroups are “clustered around a small number of distant points.” They note that a population of individuals is polarized if (i) there is a high degree of homogeneity within each group; (ii) there is a high degree of heterogeneity across different groups; and (iii) there is a small number of big groups such that groups of negligible size have a proportionately small influence on the population as a whole. The approach to polarization studies is axiomatic. Social tension and conflict increases proportionately with the degree of polarization, which, in turn, is directly proportional to the degree of clustering of homogenous subgroups.

There are two main sets of measures: pure income polarization, in which income is the variable used to group individuals, and polarization by characteristics, in which a relevant discrete characteristic, e.g., ethnicity, is used for identification of the group or equivalently, to group the population.

There are two families of polarization measures. One family of polarization measures attempts to capture the formation of any arbitrary number of groups. This family is referred to as “polarization” type of measures. Included in this family of measures are Esteban and Ray (1991), Esteban and Ray (1994), Zhang and Kanbur (2001), and Duclos, Esteban and Ray (2004). The other family of polarization measures assumes the existence of only two groups, with both groups divided along median income, and is referred to as “bi-polarization” type of measures. It includes Foster and Wolfson (1992), Wolfson (1994), Alesina and Spolaore (1997), and Wang and Tsui (2000). The different measures are also differentiated by whether they are for continuous distributions, such as Esteban and Ray (1991) and Duclos, Esteban and Ray (2004), or are for discrete distributions as in Esteban and Ray (1994).

As income is a continuous variable, dividing income distributions into a finite number of groups is unnatural. This is one reason why the family of “polarization” type of measures is generally preferred to “bi-polarization” measures and others that assume individuals to be clustered around discrete income intervals. “Bi-polarization” measures are typically used to study the phenomenon of the “vanishing middle class.”

This study uses both the Foster-Wolfson (1992) and the Duclos, Esteban and Ray (DER) (2004) polarization measures. One advantage of DER is its ability to decompose polarization into group identification and alienation, which is useful as it more clearly describes the process of group formation and the role of each of these characteristics in the estimate of polarization.

### 2.1 Foster-Wolfson’s Bi-polarization Index

The Foster-Wolfson (1992) and Wolfson's (1994) index of polarization was developed for discretely distributed bi-modal distributions, and essentially computes the “distance from a point in the distribution to a symmetric bi-modal one located at the extremes of the support” (Esteban, 2005). It is based on the Lorenz Curve and the Gini Coefficient, and is given by

$$p^W = \frac{\mu}{m} \left( \frac{1}{2} - L - \frac{G}{2} \right)$$

where $m$ is the median, $\mu$ is the sample mean, $L$ is the ordinate or $y$-value of the Lorenz curve evaluated at the median (i.e., $L = L(1/2)$), and $G$ is the Gini Index.
Note that the Foster-Wolfson index essentially assumes that polarization is an increasing function of distance from the median. This will hold only for uni-and bimodal distributions, but not for distributions with three or more modes. While the index sheds light on the hollowing out of the middle class as originally intended, it may not accurately reflect the amount of polarization when there are more than two distinct population sub-groups.

2.2 The DER (2004) Index

The DER index assumes the formation of any number of groups and is able to decompose polarization into group identification and alienation. DER utilizes a theorem which provides the form of polarization indexes that satisfy certain axioms or properties. DER shows that such measures must be proportional to:

\[
P_{\alpha}(f) \equiv \iint f(x)^{1+\alpha}f(y)|x-y|\,dx\,dy
\]  

(2)

where \( \alpha \in [0.25,1] \) and \( f(x) \) and \( f(y) \) are the density functions of stochastic variables \( x \) and \( y \), respectively.

Equation (2) underpins the DER notion of identification and alienation. Alienation is captured by the distance between \( x \) and \( y \), measured by the absolute value term, while identification is captured by the density function \( f(\cdot) \) and the values of \( f(x) \) and \( f(y) \). The parameter \( \alpha \) is bounded by 0.25 and 1, and should lie inside this interval in order to satisfy the four axioms. Horenstein and Olivieri (2004) note that the equation above can be written as:

\[
P_{\alpha}(F) \equiv \int f(y)^{\alpha}a(y)dF(y)
\]  

(3)

such that \( a(y) \) captures the alienation effect, and \( f(y)^{\alpha} \) captures identification for a given value of \( \alpha \). DER (2004) notes that the components for identification are highly dependent on the econometrician's choice of \( \alpha \) and call its further characterization as \( \alpha \)-identification. Also, Equation (2)'s form shows that when \( \alpha = 0 \), the polarization index coincides with the Gini Index. Intuitively, the simplified form the polarization index at \( \alpha \) implies that:

- the choice of \( \alpha \) matters, albeit it is bounded by 0.25 and 1
- the shape of \( f(\cdot) \) also contributes to the index of polarization

The shape of \( f(\cdot) \) dictates its measures of central tendency inclusive of modality, its variability, the amount of skewness, and kurtosis. DER (2004) notes that factors affecting the polarization index and that are dictated by the shape of the density function may not be subjected to ceteris paribus conditions in all instances. The addition of two or more local modes, for example, may or may not bring more polarization, since it could also bring down average alienation i.e., could potentially reduce distances between sub-groups in general.

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13 Strictly speaking, \( x \) and \( y \) are stochastic variables that map into individual (or group) \( i \) and \( j \)'s characteristic of interest (e.g., income).

14 For a derivation, see DER (2004), p. 1748.

15 Changing the variance or spread of a distribution for example, could affect the overall shape and configuration of a probability distribution such that other determinants of polarization (e.g., skewness and kurtosis), in the sense of the identification and alienation framework, are affected.
2.3 Conceptual Differences between Income Polarization and Inequality

Polarization is a different distributive concept from inequality. Inequality measures the spread of an income distribution, emphasizing deviation from the global mean, while polarization tries to capture clustering around local means. Polarization and inequality could be occurring simultaneously and usually go in the same direction, but they could also diverge in their movements. If there is a transfer of resources from a high-income individual to a low-income one, and these transfers occur entirely on one side of the median, then inequality will decline if for example, both individuals end up earning above the median. But polarization increases since this transfer puts this individual with the lower income further away from the median, thereby reducing the size of the middle income group and increasing the size of the wealthy group.

Wolfson (1994) notes that, “a significant innovation in discussions of income inequality is the addition, since the early 1980’s, of the ‘disappearing middle class,’ typically equated with the concept of increased inequality. He notes, however, that this line of thought is erroneous and shows that mean-preserving redistributive transfers in a uniformly distributed income distribution could result in a simultaneous occurrence of improved equality and increased polarization.

Esteban and Ray (1991, 1994) build on Wolfson’s arguments and distinction between inequality and polarization by introducing the notions of identification and alienation. Identity-alienation characteristics which are at the center of the concept of DER polarization are not captured by standard inequality measures. Identification is a sense of belonging and unity that an individual feels with others. Alienation, on the other hand, is an individual’s sense of difference from another individual or group, fuelled by his notion of identification with others within his own group. Taken jointly, identification and alienation constitute the primary framework with which their concept of polarization is built on. The condition of high degree of homogeneity and heterogeneity follows from the notion of identification and alienation, respectively.

3 Empirical Results

3.1 Trends in Polarization

Philippines

Expenditure per capita data from household surveys for the years 1985, 1988, 1991, 1994, 1997, 2000, 2003, 2006, and 2009 for the Philippines are used. Figure 1 shows estimates of the Foster-Wolson and DER indexes of expenditure per capita polarization. Population polarization generally rose from 1985 onwards, peaked in 2000 before declining. The estimates are all statistically significant given the low standard errors.

Figure 1 also shows that the population polarization measures are the highest, while urban expenditure polarization index is higher than that for the rural sector in all survey years. Urban polarization is more similar to the trend in population expenditure polarization than rural polarization. Both Foster-Wolson and DER indexes show an increase in 1991 from 1988 for population and urban indexes, while only the DER index shows a similar increase in rural polarization in 1991. 1991 was a year when a crippling power crisis hit the Philippines and the economy contracted. There were declines in the indexes for urban and total population


\[17\] Wolfson (1994).

\[18\] This is the case for all the polarization estimates obtained for the other countries as well. The table of estimates is not presented anymore due to space constraint.
polarization recorded between 1991 and 1994, and a larger one between 2000 and 2003, especially for the urban polarization measure. After 1994, all the polarization indexes rise through at least 2000, peaking in 1997 and 2000. 1997-1998 is the Asian Financial Crisis period. In contrast to the Foster-Wolfson results, the DER index for the rural sector shows a slight decline by 1994 relative to 1991. Note however, that the Foster-Wolfson index does not register any noticeable decline in rural polarization 1994 but reflects a roughly similar decline in 2009 as the DER index does. The results also show a narrowing of the gap between rural and urban polarization, with markedly rising rural polarization since 1994 and declining urban polarization, especially since 2000, using either polarization index.

Figure 3 shows the decomposition of the DER polarization index. Group identification accounts for the bulk of polarization in the population, urban, and rural subsectors while alienation only accounts for about a quarter. The covariance between alienation and identification in a group is always negative for the Philippines. There were noticeable increases in alienation and group identification for the population, rural, and urban sectors in 1997 and 2000 relative to other periods. Again, 1997 was the year the Asian Financial Crisis first struck. These increases persist through 2002, before declining to more usual levels in 2003, except in the cases of rural and population group identification, which remain high and rising through to 2009. There was likewise a noticeable rise in the population, urban, and rural alienation in 1991, 1997 and 2000, coinciding with high polarization in 1991, 1997 and 2000. 1991 and 1997 were years in which the country experienced an energy crisis and the Asian financial crisis, respectively. There were significant increases in alienation during those years, and alienation in the rural sector remained very high until 2009. Alienation in the urban sector and population declined after 2000. Alienation in the urban sector is higher than that in the rural sector in all survey years examined and is similar in magnitude to population alienation. In contrast, group identification in the rural sector is always higher than that in the urban sector.

Indonesia

Survey data for the years 1990, 1993, 1994, 1995, 1996, 1997, 1998, 2002, 2003, 2006, 2007, 2008 and 2009 for Indonesia are used. Using either the Foster-Wolfson Index or the DER index, overall income polarization in Indonesia shows a fluctuating pattern, especially after 2002. As shown in Figure 1, urban and rural polarization first showed a small peak in 1996 and then registered a very large increase in 2009. Urban polarization in Indonesia is found to be higher than population and rural polarization in all years. Urban expenditure polarization also tracks expenditure polarization of the population.

Group identification accounts for a larger share of polarization relative to alienation in Indonesia. Group identification in the rural sector is higher than that in the urban sector and generally higher than that of the population, as shown in Figure 3. It peaked in 2002, but the difference between group identification in the rural and urban sectors appears to have declined in the more recent period. In contrast, alienation in the urban sector tends to be higher than alienation in the rural sector and in the population. Alienation in the urban and rural sectors increased in 2009 relative to levels in all previous years. However, the difference between alienation in the urban and rural sectors appears to have declined in the more recent period. The covariance between alienation and group identification is always negative.

India

Expenditure per capita data from household survey data for India for the years 2004-2005, 2005-2006, 2006-2007, 2007-2008, and 2009-2010 are used. The data for 2004-2005 and 2009-2010 are from the household surveys done every five years while the rest are data from annual surveys. The annual surveys cover a smaller number of households. Estimates of both the Foster-Wolfson and DER polarization indexes for India are shown in the second row of Figure 1.
The polarization indexes in India exhibit the same general movements over time although a narrowing between urban polarization and that of the population in the 2007-2008 period is noticeable using the DER index. Urban polarization is higher than that in the rural sector and in the population.

Figure 3 shows that income polarization in India is mostly driven by group identification rather than alienation. Group identification in the urban sector had been declining steadily over time but increased in 2009-2010. Alienation in the urban sector is much higher than that in the rural sector as well as in the population, and the difference between alienation in the two sectors appears to have increased in 2009. In contrast, group identification is higher in rural than in urban areas or for the population. In India, the pattern of covariance between alienation and group identification in India is not consistent over time, and was negative only in 2004-2005, 2007-2008, and 2009-2010.

**Thailand**

Household survey data for Thailand in 2006, 2007, and 2009 are used. The survey data cover the Bangkok Metropolis, central, north, northeast, and south regions of the country, as well as the overall population. As shown in Figure 1, estimates of the Foster-Wolfson and DER polarization indexes show that among the regions, the northeast, followed by north and south, are those with the highest polarization estimates using the DER definition. However, there is a difference in the ranking of polarization estimates using the Foster-Wolfson measure. Here, the southern region has the highest level of polarization in 2007 and 2009, followed by the north and finally by the central regions. Bangkok has the lowest level of polarization. The population polarization indexes are the highest using either measure. However, the central region experienced a higher level of polarization in 2009 relative to that in 2007 using the DER index while the same is true of the northeast using the Foster-Wolfson index. It appears, therefore, that rural or regional polarization is higher than urban or at least, Bangkok’s, polarization. It also seems that using either polarization measure, population polarization has declined between 2006 and 2009.

Population estimates of alienation and group identification are higher than any of the levels for the region or Bangkok as seen in Figure 3. In contrast with findings for the other countries in which urban alienation exceeds rural or population, Bangkok has the lowest estimated levels of alienation. Bangkok also has the highest estimates of group identification. In all cases, group identification exceeds alienation. Among the regions, the north and the south have the highest levels of alienation, with the northeast not far behind. In terms of group identification, however, Bangkok metropolis and the central region have the highest levels of group identification, much higher than that for the overall population. Thus, group identification tends to be higher in the urban sector although alienation, on the other hand, also tends to be lower in the more urbanized sectors.

**Pakistan**

Overall polarization in Pakistan increased in the period between 2001-2002 and 2007-2008 using either the Foster-Wolfson index or the DER index as seen in Figure 2. The estimates for urban and rural polarization for the two periods differ depending on the index used. Using the Foster-Wolfson index, rural polarization is higher than urban polarization in 2001-2002, but the converse is true in 2007-2008. These results are opposite to those obtained using the DER index. However, both indexes show that population polarization was higher in 2007-2008 than in 2001-2002.

Group identification in Pakistan accounts for a larger share of polarization compared with alienation as seen in Figure 3. Alienation in the urban sector seems to have declined in the latter period whereas alienation in the rural sector seems to have increased over time. In contrast, group identification in the urban sector increased in the latter period but fell in the case of the
rural sector. The normalized covariance between identification and alienation is negative in all cases and years. Group identification seems to drive the change in polarization, since the total population's DER polarization rises and falls in step with group identification.

**Sri Lanka**

Polarization indexes for Sri Lanka show a slight increase in population polarization between 2006-2007 and 2009-2010 as seen in Figure 2. As in the case of Pakistan, however, the Foster-Wolfson and DER measures of polarization for Sri Lanka give contrasting results for movements in rural and urban polarization. The Foster-Wolfson index shows a higher level of urban polarization both in 2006-2007 and 2009-2010, while the DER index shows the reverse as rural polarization is consistently higher than urban polarization.

*Figure 3* shows that group identification in Sri Lanka accounts for the bulk of polarization. In 2006-2007, alienation and group identification are both higher in the rural compared to the urban sector, coinciding with higher polarization in the rural sector. Both alienation and group identification went up in the rural sector in 2009-2010, again coinciding with a higher level of rural polarization in this period relative to the preceding one. Alienation and group identification are also comparatively higher in the urban sector in similar periods, once again coinciding with a higher level of urban polarization in the later period. Group identification and alienation exhibit a negative covariance throughout all periods under consideration.

**Bangladesh**

Household survey data for Bangladesh are only available for the year 2000. As shown in Figure 2, both Foster-Wolfson and DER indexes show a higher level of polarization in the urban sector compared with that in the rural sector. Group identification accounts for most of the polarization and is especially high in the rural sector as seen in Figure 3. Alienation in the urban sector is much higher than that in the rural sector. Alienation and group identification are negatively related.

**Viet Nam**

Household survey data for Viet Nam are only available for the year 2008. Both the Foster-Wolfson and DER polarization indexes show that urban polarization is higher than either rural or population polarization as seen in Figure 2. Group identification is particularly high in the urban sector at 0.823, much higher again than those in the rural sector or population as seen in Figure 3. Alienation is also relatively higher in the urban sector and is the same as that for the population at 0.365. This is also much higher than the 0.298 level of alienation in the rural sector. Both high group identification and alienation account for high urban polarization in Viet Nam.

# 4 Polarization and Inequality

## 4.1 Inequality and Polarization

Although we earlier explained that there are conceptual differences between income inequality and polarization, studies of both inequality and polarization generally find that they move together over time.¹⁹ This is the case in this study. Without imputing any causality between them, the scatter plot showing the relationship between the Gini coefficient and the DER measure of income polarization is shown in Figure 4. Income inequality, measured using the

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Gini coefficient, and income polarization are almost perfectly positively correlated: higher income inequality is correlated with higher income polarization.

Another observation is that there are two groups of countries in the sample: one group has both higher levels of income polarization and inequality compared with the other. The group with the higher levels of income inequality and polarization includes the Philippines and Thailand and Indonesia in 2009, when the latter’s DER income polarization measure shot up to 0.256. In the more recent period, therefore, the three middle-income countries in the group had higher levels of income inequality and income polarization than the other lower income or lower-middle income countries in South Asia, such as Bangladesh, India, Sri Lanka and Pakistan. Viet Nam is at the high end of the group with the South Asian countries. Indonesia, with lower inequality levels in the early to mid-1990s comparable to the South Asian countries today, also had fairly low levels of income polarization then. In 2009, the story changed and Indonesia joined both Thailand and the Philippines in the high inequality-high income polarization group. Note, however, that 2009 is also significant as the effects of the GFC were still being felt by countries globally.

**Philippines**

The Philippines is among the countries in the region with persistently high levels of income inequality. Using nominal per capita expenditures from household consumption surveys, Figure 1 shows that the Gini for the population was on an increasing trend that peaked to 0.46 in 2000 and subsequently declined. The Gini hardly moved between 0.41 in 1985 to 0.43 in 2009.\(^{20}\) Inequality in the urban sector tends to move in a direction opposite that to inequality in the rural sector. The increasing and subsequently declining trend of the population and urban Gini indexes after 2000 was generally followed by the DER polarization index but not by the FW index.

Inequality decomposition\(^{21}\) results for the Philippines are obtained using Labor Force Survey (LFS) data covering individual wage employees with only nominal basic pay per day as a basis of wage and survey rounds for 2007 and 2009. In the Philippines, the geography of domicile is one of the factors that affect inequality. Being in an urban area, for example, explains about 80% of overall within-group inequality and about 20% of between-group inequality in the last two decades. In particular, inequality within the urban sector declined from 0.457 in 1985 to 0.41 in 2009. On the other hand, inequality within the rural sector increased from 0.34 to 0.36 between 1985 and 2009.

Changes in inequality are also most likely affected by disparities in income premiums to skills. For example, real wages grew much faster for wage earners with tertiary or higher education than for those with lower educational attainment in the Philippines from the mid-1990s to mid-2000s.\(^{22}\) In turn, data from both FIES and LFS confirm that differences in educational attainment account for as much as a third of total inequality in the country. In general, differences in wage compensation between highly-skilled and other type of workers contribute about 26% of total income inequality.

\(^{20}\) Similarly, using PoVCaNet and household data, the Gini coefficient for the Philippines hardly changed from 43.8 to 43 in 1991 and 2009, respectively. See Table 2.2.1, p. 47, *Asian Development Outlook 2012*, Asian Development Bank.

\(^{21}\) Estimates of inequality decompositions are results from processing household survey data using ADePT software. ADePT is a free program developed by World Bank to automate the most common (development) economic analyses related to poverty, inequality, labor, gender, health and social protection.

**Indonesia**

The estimated Gini index for Indonesia using per capita household expenditure data is shown in Figure 1. The pattern of inequality based on the Gini shows a very close pattern with those of the polarization indexes.\(^{23}\)

Using PovCalNet and household data for 1990 and 2011, inequality in Indonesia is estimated to have increased from 29.2 to 38.9, respectively\(^{24}\). Using the Sakernas Labor Force Survey (LFS) data on individual wage employees who earn monetary and in-kind wages for 1994 and 2009, the Gini coefficient showed a modest increase from 42 in 1994 to 44 in 2009. It appears that in Indonesia, incomes of the very rich have grown faster than the incomes of the poor. The income ratio of the top 20% to the bottom 20% in Indonesia, for example, rose from 4.4 in the 1990s to 6.6 in the 2000s\(^{25}\).

The contribution of the urban-rural gap to total inequality has not increased over the past two decades in Indonesia. Although it still accounts for a significant portion of total inequality, there was a minimal decline from 22.5% in 1990 to 18.8% in 2010. Similar results can be drawn when income differences across provinces are considered. In contrast, income differentials resulting from variations in educational attainment are a significant factor, accounting for as much as 26% of the overall income inequality in the country between 1994 and 2009. In addition, the income disparity between highly skilled and other types of workers accounts for about 15% of overall income inequality in Indonesia.

**India**

Figure 1 shows that trends in Gini exhibit the same general pattern as the polarization indexes. There were increases in inequality and polarization in 2005-2006 and 2009-2010, and the declines in these in 2004-2005 and 2007-2008. The urban Gini index is higher than that for the population while inequality in the rural sector is lowest. Urban inequality in India rose faster than rural inequality.\(^{26}\) The difference between rural and urban expenditure Gini coefficients increased in 2009-2010 relative to the previous survey years.

Estimates of inequality for India based on PovCal and household data find inequality to have risen from 32.5 in 1993 to 37 in 2010, driven by income redistribution to the top 20% of the population from the bottom 80%.\(^{27}\) The decomposition of GE(0) shows that in 1993, about 13.6% of total inequality in India can be explained by the income gap between urban and rural areas. This suggests that overall inequality in 1993 can be explained more by income differences within each sector. In particular, more than half, or 58.7%, of total inequality can be attributed to income differences within the urban sector while more than a quarter or 27.6% of total inequality can be linked to income differences within the rural countryside.

In 2009, about 21.8% of total inequality could be explained by the difference between the mean incomes of urban and rural residents in India. Income disparities between the urban and rural sectors are likely affected by widening wage premium in relation to skill differences\(^{28}\). Thus, a significantly higher human capital level in the urban sector may be reinforcing the urban-rural gap. Estimates show that differences in educational attainment of the head of household in

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\(^{23}\) This is evident from Figure 2.1.2, p. 39, Chapter 1, *Asian Development Outlook 2012*, Asian Development Bank.


India explain about 20.3% and 29.9% of total income inequality in 1993 and 2010, respectively. Income disparities between skilled and other types of workers contributed to 28.8% of total inequality in 1994 and to as much as 36.9% in 2005.

**Thailand**

The Gini for the population, shown in Figure 1, is higher than those for Bangkok and the different regions, but has declined steadily between 2006 and 2009. The figure also shows that among the regions, the north and northeast regions followed by the south have the highest Gini coefficients in 2006, while Bangkok metropolis and central have the lowest.

Using the DER index, the northeast region is seen to register the highest levels of polarization among the regions followed by the south and north. However, using the Foster-Wolffson index, the north starts off having the highest level of polarization in 2006, but in 2007 and 2009, it is the south that does. The Central region also has the third highest level of polarization, much higher than that in the northeast. In this respect, the DER estimates of polarization more closely resemble the ranking of inequality based on the Gini compared with the Foster-Wolffson index. In all cases, Bangkok metropolis has both the lowest Gini coefficients and the lowest level of polarization regardless of type of polarization index used.

**Pakistan**

Figure 2 shows that the polarization measures for Pakistan’s whole population rise and fall alongside the Gini measures for 2001-2002 and 2007-2008. However, decomposing the DER measure of polarization into urban and rural populations shows that these move in the opposite direction, as does the Gini. In 2001-2002, the Gini for the rural sector was larger than that for the urban, yet urban polarization was higher than that of rural polarization.

In 2007-2008, the Gini coefficient for the urban sector was higher than that for the rural sector and yet, in this period, rural polarization was higher than urban polarization. We note from Figure 3 that alienation in the rural sector also increased to 0.349 in 2007-2008 from the earlier one of 0.253 in 2001-2002, even as group identification in the rural sector declined. In short, rural polarization increased, with alienation in the rural sector rising as well, despite the rural sector in Pakistan having a lower Gini coefficient than that in the urban sector.

In contrast to the DER index results, the Foster-Wolffson index shows that rural polarization being higher in 2001-2002 than in the 2007-2008 coincides with higher rural inequality compared with urban inequality in the period spanning 2001-2002. The opposite is true in 2007-2008.

Looking at a much longer period between 1990 and 2007 and using PovCalNet data, inequality in Pakistan declined from 33.2 to 30.29. Inequality of education is a major conduit of income inequality in Pakistan. Estimates show income differences among individuals with different educational attainments account for about 24.7% of total inequality in the country in 2008. On the other hand, spatial inequality in the country is mainly driven by income differences between urban and rural sectors instead of provincial domiciles. In particular, the urban-rural gap accounts for about 11.0% of the country’s inequality in 2008 whereas differences in provincial domiciles only account for 2.0%. The weak contribution of provincial differences can be partly attributed to the fact that most provinces in the country are still predominantly rural.

**Sri Lanka**

The Gini coefficient for Sri Lanka between 1990 and 2006 increased from 32.5 to 40.3 based on PovCalNet data30. Figure 2 shows that urban inequality is higher than rural inequality in Sri

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Lanka in the periods 2006-2007 and 2009-2010, with both urban and rural inequality rising in the latter period from the earlier one. This finding coincides with an earlier one of higher income polarization in the urban sector using the Foster-Wolfson Index but contrasts with a lower level of urban polarization and a higher level of rural polarization using the DER Index.

Bangladesh

Figure 2 shows that in 2000, urban inequality was substantially higher than rural or population inequality in Bangladesh. It appears that both inequality and alienation are higher in the urban sector compared with the rural sector or overall population. Both measures of polarization show higher values for the urban sector, and coincide with higher inequality there.

Viet Nam

Figure 2 shows that high inequality accompanied high urban polarization in Viet Nam in 2008. Both spatial and education inequality are major drivers of income inequality in Vietnam.\textsuperscript{31} Estimates show that income differences between urban and rural residents account for 24.2% of the country’s total inequality in 2008. On the other hand, education inequality accounts for 18.5% of the observed inequality in 2008.

4.2 Polarization and Growth

Growth and Polarization

The scatter plot showing the relationship between GDP growth and income polarization across countries and over time is shown in Figures 5a and 5b. It shows that in general, faster-growing countries in overall and in per capita GDP terms also tend to exhibit lower levels of income polarization. The cluster including the South Asian lower-middle income countries such as India, Pakistan, Bangladesh as well as Viet Nam have much higher GDP and GDP per capita growth rates than upper-middle income countries such as the Philippines and Thailand in the years the survey data are available for countries in the sample. Sri Lanka, a South Asian lower-middle income country until 2006, joined the ranks of the upper middle-income countries by 2007.

Kuznets’ (1955) theory of an inverted U-shaped curve between inequality and growth states that inequality first increases as people move from the agricultural to the industrial sector and the economy grows but beyond a certain point, inequality will decline with growth. As polarization and inequality using the Gini coefficient are highly positively correlated in our sample of countries, it is not surprising to see higher polarization levels for Thailand and the Philippines, which are upper middle-income countries that have presumably progressed further along in the process of structural transformation of their economies relative to the other countries in the sample, correlated with higher polarization levels relative to the lower middle-income countries with correspondingly lower levels of polarization. Indonesia, an upper middle income country today, was until 2009 a lower middle-income country. In 1998, it had an uncharacteristically large negative GDP growth rate of -13% at the height of the Asian Financial Crisis in 1998 even as its income polarization level was low, in the same league as the other lower middle-income countries. However, by 2009, it had graduated to upper middle-income status. During the Global Financial Crisis, Indonesia had a high level of income polarization, similar to the group of upper-middle income countries of the Philippines and Thailand.

Nevertheless, two things bear emphasizing: one is that the Indonesian economy had presumably made more progress in terms of structural transformation in 2009 relative to 1998; also, both 1998 and 2009 were years of severe crises. Indonesia, in particular, was one of the worst affected economies in the region in 1998. Its 2009 growth rate of 4.63 in 2009 was also

\textsuperscript{31} Asian Development Outlook 2012, p. 65; p. 70.
relatively low compared with those in the previous years.\textsuperscript{32} Evidently, periods of crisis tend to alter seemingly stylized relationships.

\subsection*{4.3 Relationship of Other Variables with Polarization}

Without inferring or imputing the existence of any causality, we examine scatter plots of several variables usually associated with inequality against the DER population measure of income polarization.\textsuperscript{33} An 2008 ILO-ILSS report, for example, cites a perceived link between the "downsides of globalization to rising inequalities" within countries in opinion surveys.\textsuperscript{34} In a study of inter-country inequality and polarization, Seshanna and Decornez (2003) find that countries in the world have become wealthier over the last 40 years but also more unequal and more polarized, with "globalizers" exhibiting lower within group polarization and inequality than non-globalizers.\textsuperscript{35} Thus, variables that capture openness of an economy are among those included and related to polarization.

\textbf{Total Trade to GDP ratio}

The scatter plot relating the trade to GDP ratio and income polarization is shown in Figure 6. Again, the two sets of countries are divided into countries with low income polarization and those with high levels. The countries with low levels of income polarization, such as the South Asian countries and Indonesia except in 2009, generally have lower levels of trade to GDP ratio. Viet Nam is the exception, with a total trade to GDP ratio of 171.05 in 2008, the only year in which data for Viet Nam are available. The countries in this group are more closely clustered around the 40-60 percent ratio of total trade to GDP. In contrast, both the Philippines and Thailand have a more dispersed ratio of total trade to GDP, ranging from a low of 40 percent for the Philippines between 1985 and 1994 before it liberalized trade more earnestly, to over 140 percent for Thailand, whose ranges are from 126 percent to 140 percent between 2006 and 2009. From 1997 onwards, the Philippines had ratios slightly less than or in excess of 100 percent, and its income polarization levels were generally higher as well. It thus appears that more openness to trade is generally associated with higher levels of income polarization.

\textbf{Tariff rate, weighted mean, all products}

The same insight as the one above emerges when the weighted mean of tariff rates are plotted against income polarization levels as shown in Figure 7. The cluster of South Asian countries and Indonesia (except in 2009) and Viet Nam had higher weighted mean levels of tariffs and also had lower levels of income polarization. In contrast, the Philippines and Thailand are heavily clustered around low weighted mean tariffs and high levels of income polarization. The outliers are two years for the Philippines, 1988 and 1994, in which the weighted mean tariff rates were in the double digits yet income polarization levels were high. However, one also notes that

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{32} The Philippines also experienced its greatest post-War output collapse in 1984-1985. In 1985, while Philippine GDP growth was -7.5 percent, its polarization estimate was at 0.25, somewhat lower than in other years with positive growth, and consistent with the general results.
\item \textsuperscript{33} Other variables used included: control of corruption, government effectiveness, political stability or absence of violence, HDI, life expectancy at birth, adult literacy rate for those aged 15 or more, combined gross enrolment in education, domestic credit to the private sector/GDP, market capitalization of listed companies, liquid liabilities/GDP, broad money/GDP, total capital flows/GDP, total and female labor force participation rates, public spending on education as a percent of GDP, public spending on health as a percent of GDP, social assistance expenditure as a percent of GDP, fossil fuel energy consumption as a percent of total energy consumption, paved road as a percent of total roads, employment rates to total of those aged 15 and above, and the unemployment rate. None of these showed a clear relationship with income polarization in scatter plots.
\item \textsuperscript{34} ILO and IILS, 2008, p. vii.
\item \textsuperscript{35} Seshanna and Decornez, 2003, p. 335.
\end{itemize}
\end{footnotesize}
relative to the income polarization level for the Philippines when tariff rates were quite low as seen in the bottom quadrant of the figure, the income polarization levels of the Philippines were also correspondingly lower when mean-weighted tariff rates were higher.

**FDI to GDP ratio**

The scatter plot relating the FDI to GDP ratio and DER polarization is shown in Figure 8. Again, there are two groups of countries, with economies seemingly more open to foreign trade having higher levels of income polarization. The group including the Philippines, Thailand, and Indonesia in 2009 with higher polarization levels, for example, also seemingly has more vertically-dispersed and therefore slightly higher ratios of FDI to GDP than the cluster with the South Asian countries. The latter group has a tighter cluster of values of FDI to GDP ratios between 0 and 1, with the exceptions of those with higher values such as Indonesia immediately before and during the Asian Financial Crisis, India in 2007 and 2008-2009, and Pakistan in 2001-2002. Note, however, that the drop in Pakistan’s FDI to GDP ratio right after the Global Financial Crisis also lowered its polarization level. Viet Nam is the outlier with over 10 percent ratio of FDI to GDP, although its polarization level is at the high end of this cluster of countries.

**Remittances to GDP**

Another important aspect of globalization is international labor migration. It is also an important social phenomenon. In our sample of countries, the Philippines and Sri Lanka have the highest remittances to GDP ratios, followed by Pakistan, Bangladesh, and India. This phenomenon thus appears to be more characteristic of the South Asian countries than to Southeast Asian countries, in general, with the important exception of the Philippines after 2000.

No clear pattern emerges from the scatter plot in Figure 9. Thailand and pre-2000 Philippines have both low remittances to GDP ratios and high levels of polarization but Sri Lanka, Bangladesh, and India with high remittance ratios to GDP have low levels of polarization. Post-2000 Philippines has high ratios of remittances to GDP as well as high polarization levels while Sri Lanka has a low level of polarization despite also having a high ratio of remittances to GDP relative to the Philippines. However, one can also notice that Sri Lanka, with a very high ratio of remittances to GDP relative to the other South Asian countries generally also has higher levels of polarization relative to these countries such as Pakistan, Bangladesh, and India in almost all years. Meanwhile, Indonesia pre-2009 had low levels of polarization while the Philippines post 2000 had both high levels of remittances to GDP and polarization.

**Manufacturing value-added as a percent of GDP**

Here again, the scatter plot relating manufacturing value-added as a percent of GDP against DER polarization in Figure 10 shows that the group of countries with lower levels of polarization generally had lower shares of manufacturing to GDP. India, Bangladesh, Sri Lanka, and Pakistan had shares of manufacturing in GDP below 20 percent in all cases. Thailand and the Philippines had shares of manufacturing in GDP above 20 percent and also had high levels of polarization. The low share of manufacturing value added in GDP indicates the fairly incomplete process of structural transformation in these countries with low levels of polarization as well.

However, Indonesia, at least until 1994, had about the same share as the Philippines before the Asian Financial Crisis, and thereafter, its shares of manufacturing output exceeded those of the Philippines yet remained in the group of the South Asian countries, and only moving to the other group with higher polarization levels in 2009.

**Manufacturing employment to total employment**

Figure 11 shows the relationship between the ratio manufacturing employment to total employment and polarization. In this scatter plot, India, Sri Lanka, and Pakistan also have shares
of manufacturing employment out of total employment higher than those of the Philippines, and correspondingly, lower levels of polarization.\textsuperscript{36} Although Thailand has both relatively high rates of manufacturing employment to total as well as relatively high levels of polarization, note that Pakistan and Sri Lanka have even higher levels of manufacturing employment but also, lower levels of polarization relative to Thailand. Thailand also has lower levels of polarization compared with the Philippines which also has lower shares of manufacturing employment to total employment. The available data show that in 2009, when Indonesia had become an upper middle-income country, its share of manufacturing employment to total was also higher than that of the Philippines but that its level of polarization was also likewise lower than those for the Philippines.

These seem to indicate that if globalization and openness to FDI, such as in the cases of India and Pakistan in the later period of their data surveys, and trade openness, such as in the case of Sri Lanka in 2001-2002, lead to a large share of employment in manufacturing, even countries that have relatively lower income levels can not only generate faster growth rates in GDP and GDP per capita but also have lower levels of income polarization. In contrast, while the Philippines may have a higher per capita level of income relative to these South Asian countries as well as to Thailand and Indonesia, the inability of its manufacturing sector to grow and generate employment is associated with relatively high levels of polarization.

Education level of the household head and polarization

As studies of the decomposition of inequality show that the education level of the household head accounts for a large portion of within-group inequality in different countries, and possibly accounts for the skills premium in wages, it would be interesting to see how this variable is correlated with polarization. Figure 12 shows the scatter plot between these variables.

Looking at the two clusters of countries based on polarization, in general, there does appear to be a negative relationship between the educational level of the household head and the level of polarization. In the group with relatively low polarization levels, Pakistan, for example, with relatively high levels of educational attainment of the household head, has lower levels of polarization than India, Viet Nam, Sri Lanka, and Bangladesh. The fairly high level of education of the household head in Bangladesh (in that one year for which data are available, the level is between the two observations for Pakistan) is correlated with a lower level of polarization than levels in India, Viet Nam, and Sri Lanka. Similarly, Viet Nam, with a relatively low household head level of educational attainment has a higher level of polarization than the other countries in this group including pre-2009 Indonesia.

Turning to the other cluster composed of Thailand, the Philippines and Indonesia in 2009, Thailand likewise fits the pattern of having fairly low levels of educational attainment by the household head, low even relative to the other countries in the sample, correlated with relatively high levels of polarization. The Philippines does appear to be an outlier again as it has relatively high levels of education of the household head correlated with relatively high levels of polarization as well.

5 Summary and Conclusions

This study obtains estimates of two measures of income polarization in the population, rural and urban sectors using household survey data on expenditures per capita for a sample of Asian

\textsuperscript{36} Bangladesh is an outlier here with a very low manufacturing employment to total employment ratio compared with the other South Asian countries. Its FDI to GDP, total trade to GDP, weighted mean tariffs to GDP for 2000, the only year for which data are available, show that it is relatively closed and less open compared with its South Asian neighbors.
countries for different survey years. The findings regarding trends in polarization per country are summarized below:

1. Both the Foster-Wolfson and DER polarization indexes used generally give a similar reading on polarization in the different countries except in the cases of Pakistan and Sri Lanka.

2. In the Philippines, India, Pakistan, and Thailand, the level of population polarization has declined in the most recent survey period while it has increased in Indonesia, Pakistan and Sri Lanka. Bangladesh and Viet Nam, which only have a year's data, have population polarization levels of 0.22 and 0.23, respectively, which are similar to the average level of 0.233 using the DER population index for all countries in the sample. This Asian average is lower than the DER estimated average for Latin America of 0.30 in the 1990s. The Philippines (0.264) and Thailand (0.258), in particular, have average polarization levels above the average of countries in our Asian sample, especially in the most recent survey period.

3. In most countries, urban polarization is higher than rural polarization. The exceptions to this are Sri Lanka when DER is used, and Thailand, in which the polarization estimates for Bangkok using either index are lower than those for the regions. The Philippines, with an average urban polarization estimate of 0.252, has the highest level of urban polarization, followed by Bangladesh (0.238), Viet Nam (0.235) and India (0.233). Average rural polarization using the DER is highest in Sri Lanka (0.252) followed by the Philippines (0.229).

4. In all countries examined, the bulk of the DER polarization measure is due to group identification at roughly three times the level of alienation.

5. In practically all countries, rural group identification is higher than urban group identification. The exceptions to this are Thailand, Sri Lanka, and Viet Nam. On the other hand, in general, alienation in the urban sector is higher than alienation in the rural sector. The exceptions to this are Thailand, Sri Lanka, and Viet Nam once again.

6. Polarization and inequality, the latter measured using the Gini coefficient, are highly positively correlated. Nevertheless, there appears to be less of a synchronicity in their movement in countries such as the Philippines, Pakistan, and Sri Lanka using the DER index.

7. Countries with high rates of growth in GDP and per capita GDP tend to have lower levels of income polarization. However, the relationship between polarization and economic growth exhibits less of a stylized relationship than does the relationship between income inequality and polarization.

Relating population polarization measures to a variety of variables regarded as drivers of inequality, we find the Philippines to be an outlier in many ways. The Philippines has, among other attributes, relatively high educational attainment levels of the household head, very high remittance to GDP ratios, together with very low ratios of manufacturing employment to total employment. This is in contrast to a country like Pakistan, which also has a relatively high level of educational attainment of the household head but also has high ratios of manufacturing employment to total employment and moderate to low levels of remittances to GDP compared with the Philippines. To some extent, the same is the case in India which has higher ratios of manufacturing employment to total and a moderate level of remittances to GDP compared with the Philippines. Sri Lanka, like the Philippines, it has a high ratio of remittances to GDP but in contrast to the Philippines, has very high ratios of manufacturing employment to total employment. Despite the fact that unlike the Philippines, the data for the available survey year show a very low level of educational attainment by the household head in Sri Lanka, its level of polarization, as in the cases too of Pakistan and India, is much lower than those for the Philippines. In almost all cases, high educational levels of the household head go together with

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37 See Gasparini et al., 2008.
high manufacturing employment and lower levels of polarization. This may be why the Philippines, with a low ratio of manufacturing employment to total despite relatively high educational attainment levels of the household head and high levels of polarization, is an exception.

The role of globalization and openness in fostering employment in manufacturing, supporting structural transformation and keeping polarization levels low is less clear. Generally, countries which are relatively closed to foreign trade and FDI are found to also have lower levels of polarization. However, these countries were also in the lower- to lower middle-income group with low shares of value added in manufacturing, indicative of the relatively incomplete process of structural transformation in these countries. Viet Nam’s experience of successfully opening up, generating employment and fostering structural transformation may offer lessons to other countries as they graduate to the next higher income level status.

Having highly-educated heads of households appears to be an important factor as well. Massive investment in human capital, not only to replace workers who go abroad, but also to create a highly-skilled labor force to attract investment and provide jobs domestically is very important. Countries such as India, Pakistan and Sri Lanka, with higher levels of educational attainment of household heads, grew faster than the upper-middle income countries and had lower levels of polarization, despite their relative relatively high ratio of remittances to GDP. In contrast, Thailand, with a relatively low level of educational attainment by the household head, despite having a high rate of manufacturing employment, has a relatively high level of polarization as well. The quality of education matters as well, as having high literacy rates or educational attainment levels do not always imply the existence of a highly-skilled labor force that will be able to attract investment. This may be important for countries such as Thailand, which invests a relatively high 5 percent share of its GDP in education, and the Philippines, which has relatively higher educational attainment of household heads, if they are to escape the so-called “middle-income trap.”

Remittances do not seem to have a clear pattern of correlation with polarization. If any, the inference seems to be that a great dependence on remittances without the ability to generate enough jobs in manufacturing in a country, such as in the case of the Philippines, will not really contribute to raising a country’s growth rate nor foster structural transformation and movement into higher per capita income levels. Perhaps the massive loss of human capital from a country is not adequately compensated for by remittance earnings, especially if these remittances are used for current consumption rather than investment. Consumption-driven growth does not lay the foundation for future growth and sustainability of growth.

The findings suggest that educational attainment or the amount and quality of human capital and being able to produce high rates of employment in manufacturing may be very important in keeping income polarization levels low. Curiously, both higher levels of human capital and manufacturing employment tend to be more prevalent in urban sectors, yet urban polarization is generally found to be higher than rural polarization in our sample of countries. It also does appear that once a country graduates to upper middle-income or upper-income status, the likelihood of having higher levels of polarization is greater. It is unclear whether this is a necessary fact that accompanies graduation to higher income status. These are areas of future research. Meanwhile, policymakers may need to judiciously use redistributive fiscal policies to address increasing polarization. More importantly, they need to be aware that the nature of the growth process and the quality of growth overall are important not only to ensure the sustainability of growth but also to promote social cohesion and peace in society.
References


International Monetary Fund (IMF) (2006). “Rising Inequality and Polarization in Asia.” Chapter 6 in Regional Economic Outlook Asia and Pacific, 63-78, September.


**Survey Data Sources:**


____. Various years. National Socio-Economic Survey (Susenas) Datasets. Jakarta


Figure 1
Polarization, Gini and FW Indices
Figure 2

DER Polarization Index

Gini Index

Foster-Wolfson Index
Figure 3
Decomposition of DER Indices

Alienation & Identification, Urban
Philippines

Alienation & Identification, Rural
Philippines

Alienation & Identification, Total Population
Philippines

Alienation & Identification, Urban
Indonesia

Alienation & Identification, Rural
Indonesia

Alienation & Identification, Total Population
Indonesia

Alienation & Identification, Urban
India

Alienation & Identification, Rural
India

Alienation & Identification, Total Population
India

23
Figure 3
Decomposition of DER Indices

Alienation & Identification, Bangkok Metropolis
Thailand

Alienation & Identification, Central
Thailand

Alienation & Identification, Total Population
Thailand

Alienation & Identification, North
Thailand

Alienation & Identification, Northeast
Thailand

Alienation & Identification, South
Thailand

Alienation (left scale)  Identification (right scale)
Figure 3
Decomposition of DER Indices

Alienation & Identification, Urban
Pakistan

Alienation & Identification, Urban
Sri Lanka

Alienation & Identification, Urban
Bangladesh & Vietnam

Alienation & Identification, Rural
Pakistan

Alienation & Identification, Total Population
Pakistan

Alienation & Identification, Urban
Bangladesh & Vietnam

Alienation & Identification, Total Population
Sri Lanka

Alienation & Identification, Rural
Bangladesh & Vietnam

Alienation & Identification, Total Population
Pakistan

Alienation & Identification, Total Population
Sri Lanka
Figure 4
Inequality and Polarization Index

Source of basic data: This study's estimates
Figure 5a
GDP Growth and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 5b
Per Capita GDP Growth and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 6
Total Trade to GDP and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 7

Tariff Rate-Weighted Mean and Polarization Index

Source of basic data: World Bank World Development Indicators
Source of basic data: World Bank World Development Indicators; Staff estimates
Figure 9

Remittances to GDP and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 10
Manufacturing Value Added to GDP and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 11
Manufacturing Employment to Total Employment Ratio and Polarization Index

Source of basic data: World Bank World Development Indicators
Figure 12

Household Head's Education and Polarization Index

Source of basic data: ADB ERDI; National Statistics Offices; Staff calculation