

Income elasticity of human development in ASEAN countries

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ABSTRACT

Following the extensive literature on income (growth) elasticities of poverty in developing countries, this paper explores the magnitude of improvement in a country's human development as its per capita income increases. The response is measured in terms of the income elasticity of Human Development Index (HDI) published by United Nations Development Programme (UNDP). The group of ASEAN countries is studied, and the 20-year period 1990-2010 is covered. The main outcome of the exercise is that income elasticities of human development vary from a low of 0.20 to 0.25 for Cambodia, Malaysia, Myanmar, Singapore and Vietnam to a high of over 0.50 for Indonesia, indicating that there is a relatively huge variation in the rate at which income growth translates into human development even in this well-integrated group.

Keywords: Human development, income growth, income elasticity of human development, ASEAN

JEL Classification: O15, O53, O57

1. Introduction

It is obviously important to know how growth of income in a developing country impacts the well-being of the population. While there are many dimensions of a country's well-being, its poverty rate and level of human development are probably two major aspects. An enormous amount of scholarly effort has been devoted in numerous studies toward an estimation of the impact of economic growth on poverty rates in terms of what has been called the growth elasticity of poverty. A few recent examples of research on that topic include Chambers and Dhongde (2011), Lenagala and Ram (2010), Ram (2013a) and Techanan and Suriya (2012). Although estimates of the impact of income growth on poverty rates are useful, it should also be important to study how income growth affects human development, which may be perceived as the ultimate goal of economic growth. However, despite the abundance of studies on income elasticity of poverty, there is meager research in regard to the impact of economic growth on human development¹. This short paper supplements Ram (2013b) and makes a modest contribution by providing estimates of income elasticity of human development for countries belonging to the Association of Southeast Asian Nations (ASEAN). The focus on ASEAN is motivated by four thoughts. First, it is a well-integrated group of countries. Second, Son (2007, p. 8) indicated a relatively high income elasticity of poverty for Thailand, and it should be useful to see whether a similar position is observed for human development. Third, Ranis and Stewart (2012) identified Indonesia and Lao PDR among the best performers in human development during the period 1970-2007, and it should be useful to place in a comparative perspective the response of human development to income growth in these countries. Fourth, several ASEAN countries experienced a major financial crisis during the late 1990s, and it should be instructive to judge impact of the crisis on human development.

2. Methodology, data, and the main results

The countries included in the study are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. Although Brunei Darussalam and Singapore have high incomes and human development, these are included to cover the entire ASEAN group. Also, even though Malaysia too has a fairly high income level, and Myanmar has had a somewhat atypical political structure, these have been included to provide a broad perspective.

Table 1 provides a quick view of the recent levels of income and human development in the countries studied. It shows GNI per capita in PPP dollars for 2011 as a measure of income, and most numbers are taken from World Bank (2013, pp. 20-24). The level of human development is measured by two indicators. One is the well-known Human Development Index (HDI), which is constructed by United Nations Development Programme (UNDP) and is based on income, education, and life expectancy². The other is non-income Human Development Index (NHDI), which is based only on education

¹ The papers by Peneva (2012) and Fruin (2013) are recent unpublished studies of the income elasticity of human development at the global level. Ram (2013b) studied four South Asian countries.

² Technical note associated with UNDP (2013a) explains how HDI is constructed. NHDI is the geometric mean of indexes for life expectancy and education.

and life expectancy. Since HDI includes income, it is also useful to study a measure that does not include income, and consideration of NHDI is, therefore, interesting along with the more well-known HDI. Information on HDI and NHDI for 2012 is taken from United Nations Development Programme (2013a, pp. 144-147). It will be seen from the Table that Brunei Darussalam and Singapore have very high incomes and human development. The others are fairly comparable in the level of human development, and, except for Malaysia, there is not a major dissimilarity even in income³.

TABLE 1. Levels of human development and income in ASEAN countries

	GNI per capita PPP \$, 2011	HDI, 2012	Non-income HDI, 2012
Brunei Darussalam	49,910	0.855	0.832
Cambodia	2,230	0.543	0.597
Indonesia	4,500	0.629	0.672
Lao PDR	2,580	0.543	0.584
Malaysia	15,650	0.769	0.791
Myanmar	1,817	0.498	0.537
Philippines	4,140	0.654	0.724
Singapore	59,380	0.895	0.880
Thailand	8,360	0.690	0.715
Vietnam	3,250	0.617	0.686

Notes. Except for Myanmar, GNI per capita is taken from World Bank (2013, pp. 20-24), and the number for Myanmar is GNI per capita in 2005 PPP dollars taken from UNDP (2013a, p. 146). Information on HDI and NHDI is from UNDP (2013a, pp. 144-147).

The core of the work lies in comparing rates of increase in income, which is measured by GDP per capita in constant-price local-currency units (LCU), and in human development, which is proxied by HDI and NHDI, and deriving the income elasticity of human development. The 20-year period 1990-2010 is considered, which is recent and fairly long and should yield a reasonably good measure of the response of human development to increased income. Data on GDP per capita from 1990 to 2010 are taken from World Bank (2012). Information on HDI and NHDI is from UNDP (2013b) web site, and is available on a comparable basis for the years 1990, 2000, and 2005-2012 for most countries⁴. The end point of the period for HDI and NHDI is later than that for income, which makes income slightly predetermined and permits some lag in income growth translating into human development.

³ Except for Brunei Darussalam, Malaysia, and Singapore, 2012 HDI ranks for the countries fall in a relatively narrow range from 103 (Thailand) to 149 (Myanmar).

⁴ Information on HDI is missing for 1990 for Cambodia. For Singapore, HDI and NHDI data are missing for the years 2006, 2007 and 2008.

Annual rates of increase of income and human development are estimated from the following logarithmic regression

$$\ln(H_t) = a + bt + u_t \quad (1)$$

where $\ln(H_t)$ stands for natural logarithm of the value of HDI, NHDI or income in year t , and t takes values from 1 to 21. The annual rate of increase is approximated by the estimate of b .

Following Ram (2013a, p. 555) and some other researchers, income elasticity of human development is directly calculated from the following definitional expression:

$$E_i = GH_i / GY_i \quad (2)$$

where E_i is the income elasticity of human development (HDI or NHDI) for country i , GH_i denotes the annual rate of increase of HDI or NHDI in the country, and GY_i stands for the annual rate of increase of real GDP per capita.

Table 2 reports estimates of primary interest. It shows for each country annual rates of increase of HDI, NHDI, and real GDP per capita over the period, and income elasticities of HDI and NHDI. Seven points suggested by the Table seem interesting. First, per-capita GDP growth rates show a substantial dispersion. The growth rate for Brunei Darussalam is negative. The high growth in Myanmar is notable, and the rates of growth for Cambodia and Vietnam are very good. While the number for Philippines is low, growth rates for Indonesia and Thailand appear reasonable despite the countries having experienced a major financial crisis in the 1990s. Second, rates of increase of both HDI and NHDI show considerable dispersion. The low increase in HDI in Brunei Darussalam probably reflects the negative income growth, but the rate of increase of NHDI is good despite the high income and HDI levels. For Singapore also, rates of increase of HDI and NHDI are good despite the high income and human development. Third, relative to the core of the study, overlooking the negative elasticities for Brunei Darussalam, income elasticities of HDI show a huge variation from a low of 0.20 for Malaysia to a high of 0.52 for Indonesia. The elasticities for NHDI show a similar variation from a low of 0.16 for Myanmar to a high of 0.53 for Indonesia. Fourth, despite having experienced a major financial crisis, Indonesia has the highest elasticities, which is consistent with Ranis and Stewart (2012) who identified the country as a high achiever in human development. Somewhat similarly, Lao PDR ranks second in the elasticities and may be deemed to reflect at least weakly the position articulated by Ranis and Stewart (2012) that the country is a case of success in human development. Fifth, elasticities for Thailand are reasonable, but reflect only weakly the relatively high income elasticity of headcount poverty noted by Son (2007, p. 8). Perhaps the lingering effect of the financial crisis is captured more in the period covered in the present study than in that (1988-2000) included in Son's (2007) work. Sixth, while the low elasticities for Singapore might be expected due to its high income and human development, the elasticities for Cambodia, Malaysia, Myanmar, and Vietnam are low. Last, a quick and crude comparison suggests that income elasticities of human development in ASEAN countries are generally weaker than those in South Asia since Ram (2013b) reported the elasticities for Nepal and Pakistan to range from 0.75 to 0.99

and that for Bangladesh to be 0.48⁵. Perhaps the low elasticities in ASEAN countries reflect partly the effect of the financial crisis of the 1990s.

TABLE 2. Rates of growth of income and human development, and income elasticities of HDI and non-income HDI (NHDI) in selected ASEAN countries

	Annual rates of increase, 1990-2010 (%)			income elasticity of	
	GDP per capita	HDI	NHDI	HDI	NHDI
	(1)	(2)	(3)	(2)/(1)	(3)/(1)
Brunei D.	-0.40	0.22	0.65	*	*
Cambodia	6.31	1.61	1.20	0.26	0.19
Indonesia	2.58	1.33	1.37	0.52	0.53
Lao PDR	4.44	1.53	1.69	0.34	0.38
Malaysia	3.09	0.63	0.91	0.20	0.29
Myanmar	8.72	2.28	1.42	0.26	0.16
Philippines	1.83	0.59	0.55	0.32	0.30
Singapore	3.43	0.78	0.87	0.23	0.25
Thailand	2.77	0.80	0.97	0.29	0.35
Vietnam	5.81	1.23	1.29	0.21	0.22

Notes. 1. Data on GDP per capita (constant LCU) are from World Bank (2012) and information for HDI and NHDI is from UNDP (2013b) web site. As explained in the text, rates of increase (growth) are obtained by estimating an exponential growth equation, and elasticities are the ratio of rate of growth of HDI or NHDI to rate of income growth. Also, rates of growth of HDI and NHDI are for the period 1990-2012, which makes rates of growth of GDP per capita (1990-2010) slightly predetermined. For Cambodia, the rate of growth of GDP per capita is for 1993-2010 since data on GDP per capita for 1990, 1991 and 1992 are not given in the source (World Bank, 2012). For Brunei Darussalam, GDP per capita for 2010 was not available in the source. Please also see the text and footnote 4 for missing data on HDI and NHDI.

2. The elasticities for Brunei Darussalam are not reported since these are negative.

By way of one major outcome of the present research, it may thus be said that even in this relatively well-integrated group, income growth translates into human development at very different rates. The elasticities imply that the (percent) increase in human development generated by one percent income growth in Indonesia might be twice as large as that generated in several other countries. It is reasonable to believe that the orientation of government policies might be one factor behind these differences. In a related context, UNDP (2000, p. 149) had observed that cross-country differences in HDI changes between 1975 and 1998 "result from a combination of factors, but the policies countries pursued are a major determinant". In that context, however, it is somewhat puzzling to note the low elasticities for Myanmar and Vietnam where one might expect a strong public policy focus on human development in the form of education and health. Perhaps the high income growth in these countries would take more time to translate into human development.

⁵ These observations are based on Ram (2013b).

3. A few additional reflections

First, following Ram (2013a, 2013b), income elasticities of human development are calculated directly as the ratio of percent increase in HDI or NHDI to percent increase in real GNI per capita. An alternative would be to estimate the elasticities by regressing logarithm of HDI (or NHDI) on logarithm of real per-capita income (and possibly other variables). Also, there may be some efficiency gain by doing the estimation through the seemingly-unrelated-regression (SUR) procedure. However, regression estimation does not seem feasible due to the small number of usable paired observations, which ranges from five for Singapore to eight for most other countries. Moreover, our preliminary exercise indicates that SUR estimates show broadly the same pattern as the elasticities in Table 2, but have a somewhat smaller dispersion than our directly-calculated numbers which seem preferable⁶.

Second, it was noted in the previous section that Indonesia has a considerably higher elasticity than other countries, which seems consistent with the analysis done by Ranis and Stewart (2012) through a different methodology. It should be interesting to explore in greater detail reasons for Indonesia's higher elasticities. That should be a useful project for future research. Somewhat similarly, reasons for the elasticities reported by Ram (2013b) for South Asia being considerably higher than those in Table 2 for ASEAN countries should be a useful topic for future research.

Third, it might be noted that human development is treated in the present study as an outcome variable while income growth is taken as an "input". There is perhaps some impact of human development on growth, but that is considered secondary and is deemed to be mitigated by income being slightly predetermined. At any rate, the reported large differences in the covariation between income growth and human development in this well-integrated group of countries should be of considerable interest and worthy of further exploration.

4. Concluding observations

This work is based on the thought that even though numerous scholars have reported estimates of the income (growth) elasticities of poverty, the response of human development to income growth has received very little attention. Using data on GDP per capita, HDI, and NHDI for ASEAN countries covering the period 1990-2010, this study generates income elasticities of human development in a manner similar to that done by Ram (2013a) and some other scholars for the growth-poverty nexus. The most striking outcome is the huge diversity, even in this well-integrated group of countries, in the rate at which income growth translates into human development. The elasticities imply that the (percent) increase in human development generated by one percent income growth in Indonesia may be twice as large as that generated in several other countries in the

⁶ For example, non-negative SUR elasticity estimates for NHDI are 0.23 (Cambodia), 0.42 (Indonesia), 0.39 (Lao PDR), 0.29 (Malaysia), 0.17 (Myanmar), 0.29 (Philippines), 0.26 (Singapore), 0.28 (Thailand), and 0.23 (Vietnam). These are almost identical with the corresponding OLS estimates. It may also be noted that, apart from its possible intrinsic appeal, our "direct" procedure enables us to use all available numbers on each variable for every country since there is no need to pair data on income and HDI (or NHDI).

group. The diversity might partly reflect the relative focus of government policies on income growth and human development, although the low numbers for Myanmar and Vietnam might seem a little surprising in that context. There seems considerable scope for further research on the topic.

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