Development and Inequality: A New Specification of the Kuznets Hypothesis

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Abstract

There has been a great deal of research done in an attempt to prove or disprove the Kuznets hypothesis –a traditional relationship between inequality and development. All of the literature to date deals with the relationship between income inequality and per capita income; however, the use of per capita income as a measure of economic development has been criticized as being inadequate for this purpose. An alternative measure of development, the Human Development Index (HDI), considers other indicators of a country's level of development. In this paper, I will explore the relationship between income inequality and the level of development utilizing the HDI as a measure of development. I will also show that the change from the traditional GDP model to a new HDI based model changes the shape of the Kuznets curve significantly when compared to the most current research.

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1 Introduction

1.1 *History of the Kuznets Hypothesis*

Since 1955, when Kuznets "Economic Growth and Income Inequality" was published, the Kuznets hypothesis has taken on a life of its own. In his paper Kuznets did not make an argument for what subsequently would be called the "Kuznets hypothesis." Instead while lamenting the absence of appropriate data, he argues that income inequality is higher in less developed countries. In addition for the "older developed countries" he noted that income inequality first rises "in the early stages of industrialization" then falls as "leveling forces become strong enough first to stabilize and then reduce income inequalities." But Kuznets did not suggest that this pattern seen in the "older developed countries" will be repeated in the future and warned that "there is a danger in simple analogies" between past patterns and the present and future.

Work since 1955 on the Kuznets hypothesis largely ignored Kuznets' warnings and proceeded with the idea that the inverted U is a "stylized fact" of economics. The traditional inverted-U has two regions.

The first region of the Kuznets curve occurs at low levels of development when the level of development and inequality move in the same direction. Economists, for the most part, explain this phenomenon in two ways. At low levels of development either increased inequality facilitates increased development or that the development itself causes rising inequality. Proponents of the first of these conclusions explain that the poor in the countries lying in the low development region of the curve lack the means to save and invest, thus if investment is to take place it needs to be done by the wealthy segment of the population. Higher inequality means a greater share of resources go to the wealthy who can provide additional investment and capital for economic growth. Those in support of the other conclusion explain that in the context of a country with a less developed country, the rich enrich themselves further, as the country develops while the poor remain at essentially the same economic level. This can be explained further by the fact that the upper classes would have greater access to education and other resources allowing them to take advantage of new economic sectors, which frequently exhibit higher profit rates than traditional economic sectors.

The second region occurs at a higher level of development than the first region. In this second region of the Kuznets curve, inequality and development move in opposite directions. This means that as a country's level of development increases in this region, the country's level of inequality declines. A major theory explains this phenomenon in the following way: a country at this level of development has a capital base that has been sufficiently established so that growth now provides an equalizing force and inequality decreases.

Many of the older works on this subject found support for the Kuznets hypothesis. Felix Paukert in his 1973 paper did the same type of work as Kuznets himself and found results largely consistent with the Kuznets hypothesis. Montek Ahluwalia in 1976 published a paper, which was considered the definitive work on the Kuznets hypothesis. Ahluwalia turned to cross-sectional econometrics to explore this subject and found fairly strong evidence in support of the hypothesis.

More recent works have questioned the validity of the Kuznets hypothesis. Saith (1983) questioned Ahluwalia's results. Most of the questions raised in Saith's paper deal with Ahluwalia's method of accounting for differences between capitalist and communist countries and are largely unconvincing. Saith, however, raises one other interesting point. He questions the use of cross-sectional data to explain a phenomenon, which supposedly takes place in a single country over a period of time. Additionally, Rati Ram finds uncertainty in the Kuznets hypothesis in two papers published in 1984 and 1997. In his 1984 paper, Ram adds new regressors to the econometrics done by Ahluwalia. With these new regressors added, none of the income variables have statistical significance. This could be a result of either the new regressors or the fact that the sample size is smaller than that used in Ahluwalia's paper. However Ram's results demonstrate a significant change from previous results and begin to call into question the idea behind the Kuznets hypothesis. In 1997, Ram demonstrates that some countries lying in the area of the Kuznets curve where they should be experiencing decreasing inequality, according to the theory, actually have increasing inequality.

Tribble (1999) argues that the inverted U-curve is "at best an incomplete picture of the economic development process." He used time-series data for the United States to reject the inverted U curve in favor of what he calls "the S-curve hypothesis." The S-curve has the traditional inverted U at lower levels of development, but in contrast to the Kuznets, it shows increasing inequality for countries at higher levels of development. Tribble suggests that this new curve captures two transitions in an economy; the first transition, occurring at lower levels of development, is from an agriculturally based economy to one based in manufacturing and a second transition, occurring at higher levels of development, where services begin to replace manufacturing in the economy. Additionally, List and Gallet (1999) used panel data from the years 1961-92 to estimate the Kuznets curve. They use three different estimates, pooled OLS, fixed effects, and random effects to find support for Tribble's assertion.

Keeping in mind the traditional interpretation of the Kuznets hypothesis as a correlation between inequality and development, the goal of this paper is to analyze a relationship that is perhaps more valid in measuring Kuznets original idea than the relationship that has been studied traditionally.

1.2 Why a new specification?

Per capita GDP is used as a measure of the level of development in each of the papers cited here and none of the authors question its use. If the interpretation of past studies had been exploring the relationship between a country's level of wealth and its inequality, then these studies would have done a fine job covering the subject. However invariably economists interpret these relationships in terms of growth and development.

Ahluwalia, in his 1976 study attempted to explore "the relationship between the distribution of income and the process of development" and to do that he "[took] the per capita GNP of each country (in US$ at 1965-1971 prices) as a summary measure of its level of development." He also interpreted his results along development lines stating that "[the results] can also be viewed as providing some clues to the mechanisms through which the development process affects the degree of inequality." More recently, List and Gallet (1999) also interpret their S-curve results in the same way, stating, "for lower-developed to middle-developed countries, the Kuznets curve is indeed an inverted-U. For higher-developed countries, however, the relationship between income inequality and per capita income becomes positive." It is obvious that here they also are treating per capita income as representing level of development.

Why is the use of GDP as a measure of development a problem? Many economists have justified the use of GDP as a measure of development noting the correlation between per capita GDP and other factors associated with the level of development. As Table 1 shows there are significant correlations between per capita GDP and other measurements of the level of development.

Table 1. Correlations

	Life Expectancy	*Adult Literacy*	*Enrolment Ratio*
Per Capita GDP	0.703112	0.518402	0.632189

Sen (1997), however questions the use of income as a measure of well-being and finds substantial differences between income of a country and other factors that govern the quality of life for its citizens. He presents an "illustrations of contrasts" giving the example of "six countries (China, Sri Lanka, Namibia, Brazil, South Africa, and Gabon) and one sizable state (Kerala) within a country (India)." While China, Sri Lanka, and Kerala all have substantially lower per capita GNP than the other countries listed they all exhibit dramatically higher life expectancy rates. This leads to the conclusion that income is only a small part of the picture in looking at the overall well-being and level of development of a country. Other things to consider are the opportunity for a full and healthy life and the ability to achieve ones goals.

A substantial improvement in the measurement of the level of development is the Human Development Index published by the United Nations. The HDI is "a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living". Looking at Table 2 one can see that when considering factors associated with level of development, which are not themselves components of the HDI, that the HDI presents higher correlation levels than per capita GDP. The fact that all these correlations are negative is to be expected as countries having a higher HDI or per capita GDP would be expected to have a population with a greater degree of access to clean water, health services, and sanitation. This correlation pattern lends credence to the idea that HDI is a better measure of development that per capita GDP.

Table 2 Correlations

% of Population Without Access to	*Per Capita GDP*	*HDI*
Clean Water	-0.606	-0.712
Health Services	-0.451	-0.593
Sanitation	-0.595	-0.695

Because the method of calculating the HDI has changed substantially over the years, it was necessary to calculate the HDI in a way that is consistent for all years. Thus the HDI measurements used in this paper were recalculated using the method utilized in the 2001 Human Development Report.

There are three dimensional indices in the HDI calculation: the life expectancy index, the education index, and the GDP index. Each of these indices is calculated in the same basic way:

$$\text{Dimensional Index} = \frac{\text{Actual Value - Minimum Value}}{\text{Maximum Value - Minimum Value}}$$

The maximum and minimum values are assigned as shown in Table 3.

- The life expectancy index is based on life expectancy at birth.
- The education index is calculated using two sub-indices: the adult literacy index, and the enrolment index. Each of these sub indices is calculated as if it were a dimensional index and each is given 2/3 and 1/3 weights respectively in the calculation of the education index.
- The GDP index is calculated from per capita GDP in US dollars adjusted for purchasing power parity.

Each of these indices has an equal value in the calculation of the HDI.

Table 3

Dimensional Index	*Maximum Value*	*Minimum Value*
Life Expectancy	85	25
Adult Literacy	100	0
Enrolment Ratio	100	0
Per Capita GDP	40,000	100

The expectation is that each of the factors included in the HDI governs, in some aspect, the quality of life for the citizens of a country. This measure can substantially differentiate between two countries with the same per capita GDP by including these other indicators. The 2001 Human Development Report gives the example of Viet Nam and Pakistan, which have very similar levels of per capita GDP ($1,860 and $1,834 PPP respectively). However, Viet Nam has higher life expectancy, literacy rates, and school enrolment. Due to these factors Viet Nam and Pakistan have very different HDIs (0.682 and 0.498 respectively.)

2 Data

In estimating the Kuznets relationship I utilize Theil's T statistic[1] as a measure of income inequality and the Human Development Index[2] as a measure of development.

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[1] Theil's T statistic was computed using the UNIDO 2000 release of the Industrial Statistics by the University of Texas Inequality Project web site: http://utip.gov.utexas.edu
[2] HDI was calculated from the United Nations Human Development Report using data from 1992 to 1998. The calculation method utilized can be found in the 2001 HDR

2.1 The Theil Index

The most commonly used measure of inequality is the Gini coefficient, which can be easily represented graphically and is preferred by some because it is not a mean centered measurement. However, problems also exist with the use of the Gini because it is not measured using the same type of data in all countries. In contrast the Theil index published by the University of Texas Inequality Project uses uniform wage data in its calculation. An additional advantage of UTIP's use of wage data is that we avoid problems with endogeneity as the HDI uses GDP data. The Theil index is a mean centered measurement based on information theory that exhibits all the normally desired properties of an inequality measurement. Information theory states that the amount of information that an event gives you is based on the probability of that event occurring. The event with the smallest probability of occurring is the one which gives you the most information. The Theil index in its most general form combines two forms of inequality: within-group and between-group. The mathematical specification for this general form of the Theil index is:

$$T = \sum_{j=1}^{M} p_j R_j \log R_j + \sum_{j=1}^{M} p_j R_j T_j \tag{1-0}$$

where

$$p_j = \frac{e_j}{\sum_{j=1}^{M} e_j} \tag{1-1}$$

$$R_j = \frac{\mu_j}{\mu} \tag{1-2}$$

$$\mu = \frac{\sum_{j=1}^{M} e_j \mu_j}{\sum_{j=1}^{M} e_j} \tag{1-3}$$

$$T_j = \frac{1}{n_j} \sum_{i \in g_j} r_i \log r_i \tag{1-4}$$

where μ_j and e_j are the mean income and population size for group j respectively, μ is the mean income for all groups combined. As Darity and Deshpande (2000) explain that this makes R_j "the ratio of the mean income for the jth group to the mean income for the entire population while p_j is the jth group's population share." In this general form, the first term in equation (1-0) is the "between group inequality" and the second term is the "within group inequality". Unfortunately most statistics are summary statistics for groups, making it impossible to calculate the within group inequality. In these cases, the Theil index can be crudely simplified to:

$$T' = \sum_{j=1}^{M} p_j R_j \log R_j \tag{2-0}$$

with R_j and p_j defined in the same way as above. Regardless of the way in which the Theil index is calculated, the values can range from zero to infinity with zero being the most equal distribution of income.

2.2 The Human Development Index

By dividing the HDI data used in this paper into groupings of countries with low, medium, and high development we can see some trends worth noting. The countries were divided based on the convention used by the Human Development Report (2001). According to this convention countries with a HDI less than 0.500 are considered to exhibit low human development, countries with a HDI between 0.500 and 0.799 exhibit medium human development, and countries who's HDI meets or exceeds 0.800 are at a high level of human development. For the purpose of this comparison countries were divided based on their placement in 1992, the first year of data used in this paper, regardless of their subsequent changes in HDI.

Comparing changes in the human development index for each of the three categories, one can see from Table 4 (in appendix) that while the HDI for high, (Figure 1) and medium (Figure 2) human development countries increased fairly constantly, low development countries (Figure 3) had much more erratic changes in their HDI level. For low development countries HDI rose slightly between 1992 and 1993, declined slightly in 1994, rose fairly dramatically in 1995 and then leveled off. These movements have combined to increase the separation between all three groups of countries.

Like the human development index itself, most of the components of the HDI exhibited an increase in the separation between country groups. The most dramatic of these was per capita GDP, which rose substantially for high and medium development countries but actually fell for low development countries over the period examined. This caused the gap between high and low countries to expand from the 1992 level of $15,357.2 to the 1998 level of $18,486, a substantial increase in this gap. Also while per capita GDP also rose for medium development countries, high development countries far outpaced them increasing the gap between these two groups from $12,432.8 to $14,772.3. The exception to this general rule of gap expansion is the adult literacy rate. For this component the gaps between groups actually narrowed for all the groups considered. The trends for all the groups can be seen in figures 4-15 (Appendix).

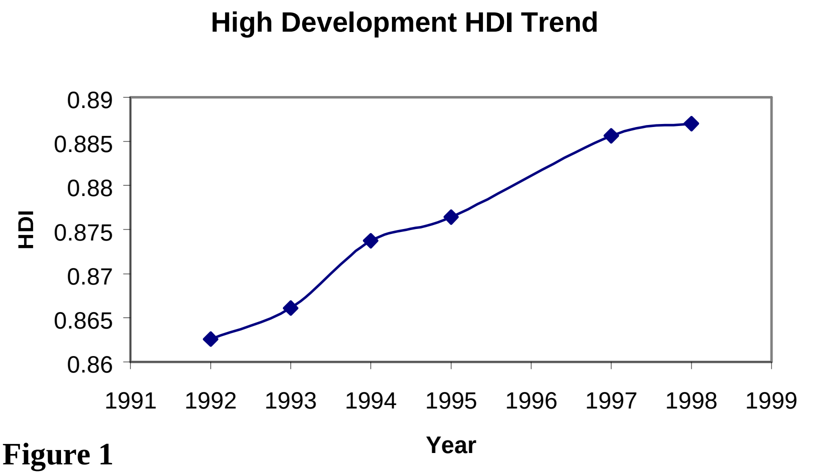

Figure 1

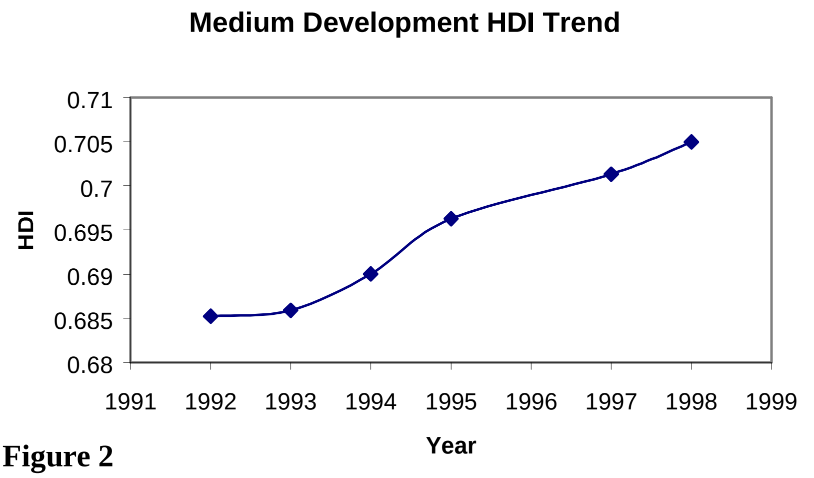

Figure 2

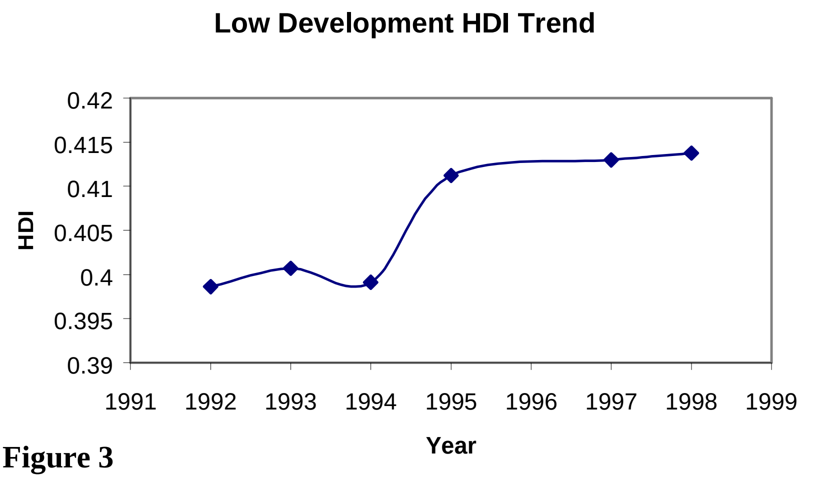

Figure 3

My data set includes 444 observations from 111 countries for the years 1992-98. All regressions use ordinary least squares to estimate the reduced form relationship between the independent variables and the log of Theil's T statistic.

Table 5. Descriptive Statistics

Variable	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
Theil's T statistic	0.0782	0.0999	0.0025	1.0257
HDI	0.7319	0.1474	0.280	0.935

3. Results

Regression 1 is an attempt to recreate the results achieved by List and Gallet (1999) who worked with the traditional GDP based model of the Kuznets hypothesis. It should be noted, however, the data set used in this paper is for a much shorter time period and utilizes Theil's T statistic instead of the Gini coefficient used by List and Gallet. Despite the differences in variables and specification, this regression does achieve results similar to List and Gallet for the overall shape of the curve, which they argue, is S-shaped. However, the turning points are substantially higher than those found by List and Gallet. Figure 16 shows the data points (small pink dots) and the predicted values of GDP per capita using the coefficients from regression 1 (blue diamonds). As the level of income increases, inequality first increases rapidly. Inequality falls after a per capita GDP of $1,407and past $58,556 it begins to slowly increase again. Tribble describes this second increase as possibly resulting from a shift away from manufacturing towards a service based economy in the countries that are in this region of the curve.

Regressions 4 and 5 are also duplicate work done by List and Gallet (1999) and despite the differences noted above again achieve similar results in the shape of the curves. All the coefficients are of the sign expected and are similar to each other in value. However regression 4, the fixed effects regression, whose predicted Theil values are shown in Figure 18, has no variable that is statistically significant at the 5% level, which is not what was found by List and Gallet in the same type of regression. This problem may be due to the short length of the data set used in this paper relative to the one used by List and Gallet. On the other hand Regression 5, shown in Figure 19, has all variables statistically significant at the 1% level. Both the F and Wald chi^2 tests have significance at 1% level. This suggests that the pooled OLS estimates are inefficient in the best-case scenario.

Regressions 2, 3, 6, and 7 were preformed with the human development index in place of GDP. For regression 2 all coefficients are significant at the 95% level and only the coefficient on $\log (HDI)^3$ fails to be significant at the 99% level. Figure 16 shows a representation of this relationship. It is surprising that, while this regression still yields an S-curve, it is exactly the opposite of the curve found in the regressions with GDP. Because all the coefficients are negative it is a little confusing how they form an S curve as shown in Figure 17, however, it should be noted that the HDI is a number between 0 and 1 making log(HDI) and $\log(HDI)^3$ negative numbers. Meaning these terms are net positive when combined with their coefficients.

Observing Figures 16 and 17, it can be seen that the other factors involved in the HDI obviously have a large effect on the ordering of the sample. This can be observed in the clustering of the data points. For GDP the data points are clustered at the lower end of the scale, whereas for HDI, the points are clustered at the upper end of the scale. This change is due to the fact that the HDI is not based solely on income. For example Poland (GDP=$7619, HDI=0.814) would be classified towards the lower end of the scale under

Table 6.[3, 4]

Independent Variable	*Regression 1 Pooled OLS*	*Regression 2 Pooled OLS*	*Regression 3 Pooled OLS*	*Regression 4 Fixed Effects*	*Regression 5 Random Effects*	*Regression 6 Fixed Effects*	*Regression 7 Random Effects*
Constant	-59.34*	-2.00*	-53.48*	—	-59.88*	—	-11.68*
	(-2.9)	(-27.2)	(-2.9)		(-3.27)		(-9.70)
Log(GDP)	14.44**	—	—	15.06***	18.49*	—	—
	(2.2)			(1.88)	(2.73)		
$Log(GDP)^2$	-3.81**	—	—	-1.75***	-2.21*	—	—
	(-2.1)			(-1.79)	(-2.70)		
$Log(GDP)^3$	0.32***	—	—	0.067***	0.086*	—	—
	(1.9)			(1.70)	(2.61)		
Log (HDI)	—	-8.59*	-9.02*	—	—	-1.82	-4.23*
		(-6.6)	(-6.9)			(-0.94)	(-4.62)
$Log(HDI)^2$	—	-24.03*	-25.63*	—	—	-1.71	-2.47*
		(-3.8)	(-4.1)			(-1.14)	(-3.07)
$Log(HDI)^3$	—	-20.52**	-22.35*	—	—	—	—
		(-2.5)	(-2.7)				
Year	0.020**	—	0.026*	0.069*	0.075*	0.074*	0.082*
	(2.1)		(2.8)	(5.23)	(6.01)	(5.25)	(6.71)
$F(\alpha_i=0)$	—	—	—	9.98*	—	12.00*	—
(df)				(4,327)		(3,328)	
Wald chi^2	—	—	—	—	57.53*	—	66.34*
(df)					(4)		(3)
R^2	0.21	0.29	0.30	0.04	0.21	0.08	0.27
Adj. R^2	0.21	0.28	0.29	—	—	—	—

[3] Dependent variable is the log of Theil's T statistic
[4] t-statistics in parentheses
* Significant at 0.01 level; ** Significant at 0.05 level; ***Significant at 0.10 level

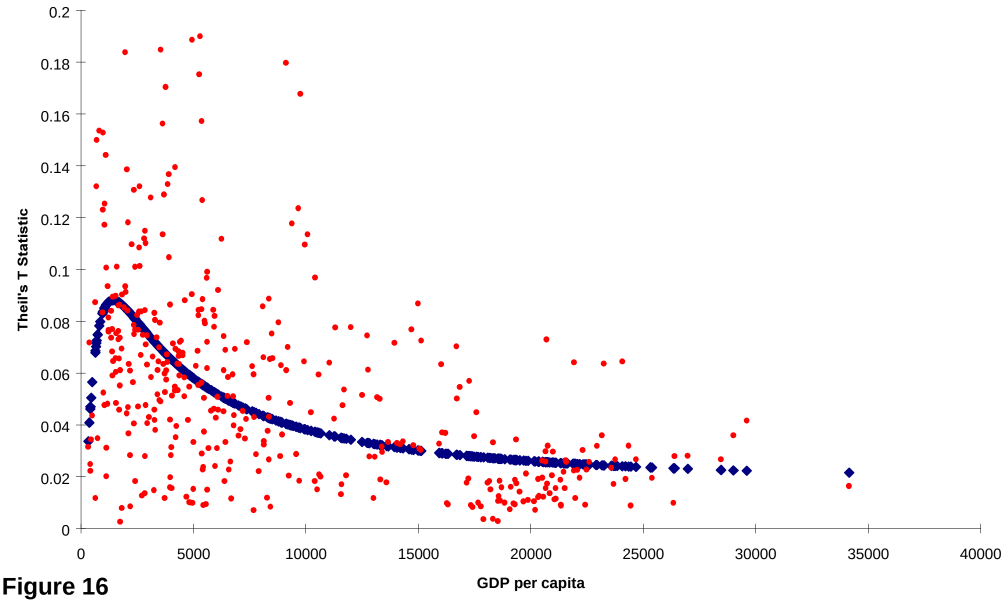

Figure 16

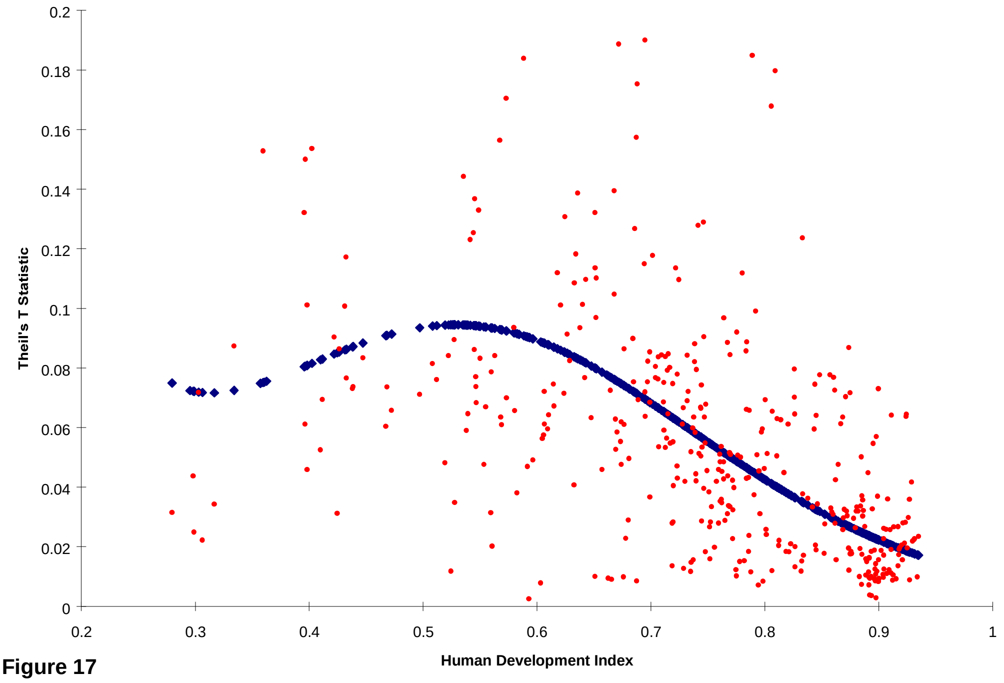

Figure 17

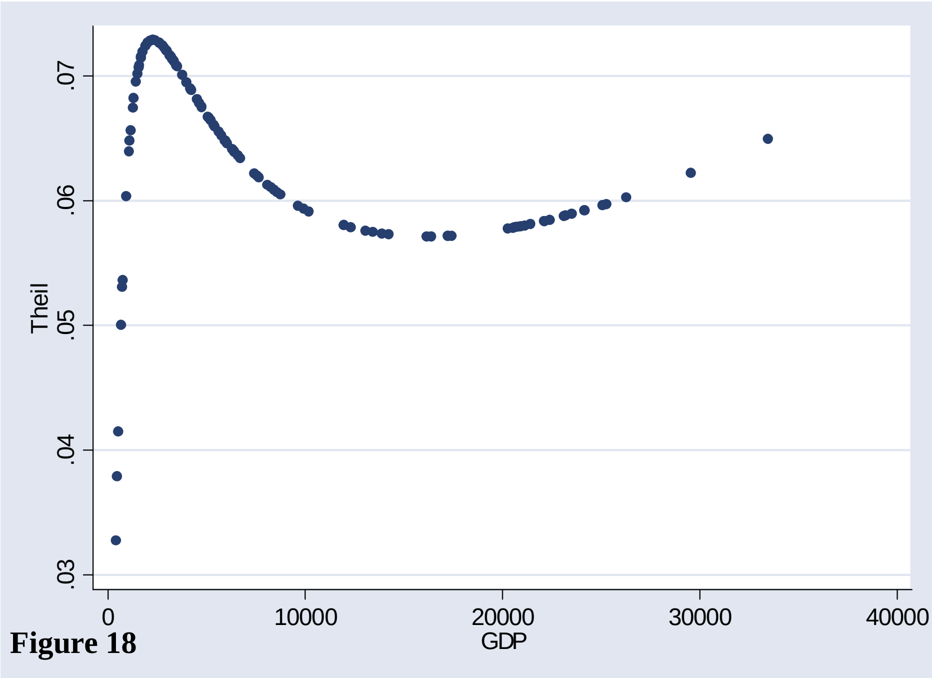

Figure 18

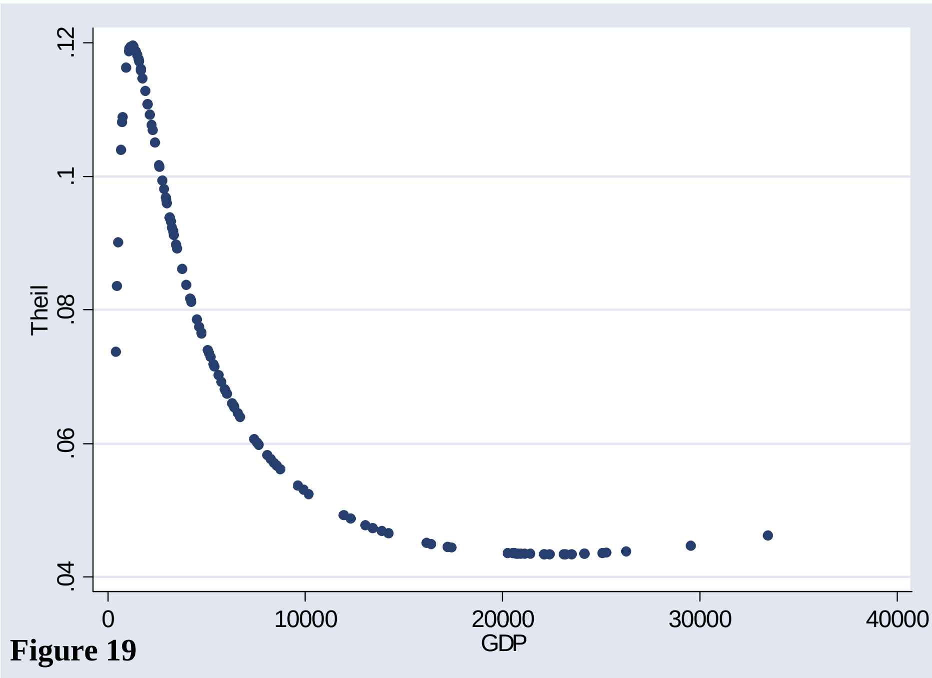

Figure 19

the GDP system but because of high life expectancy and education levels, it is at the upper end of the HDI scale. Meanwhile there are several countries (US, Canada, Norway, etc) that would be classified at the upper end of either scale.

The addition of the year control in regression 3 raises the magnitude of all the coefficients in the regression but only affects the constant term significantly. The positive coefficient on the year seems to imply that inequality is increasing over time. This may account for the general observation that inequality seems to be increasing in highly developed countries. The predicted Theil values for regression 3 are shown in figure 20. Figure 21 is a diagram of the predicted curves for the different years examined. Even though the lowest observation of HDI occurs at 0.280, figure 21 extends the predicted curves down to a HDI of 0.200 to show expected Theil values at these lower levels of human development.

Regression 6 is a fixed effects model of the HDI specified Kuznets curve. This model was also estimated in cubic specification but the cubic term did not show any significance. The only terms that show significance in this regression are the constant and year coefficients but reducing the form to linear does not cause any coefficients to gain significance. Figure 22 shows the predicted Theil statistics from this regression.

Regression 7 (Figure 23) is the same model as regression 6 but in a random effects specification. All coefficients in this regression are significant at the 1% level. It should be noted here, as in regressions 4 and 5, that the F and Wald tests indicate the inefficiency of pooled OLS. It is also should be noticed that changing to this more efficient estimation technique changes the shape of the predicted curve to the one traditionally advocated by Kuznets, as can be seen in figure 21.

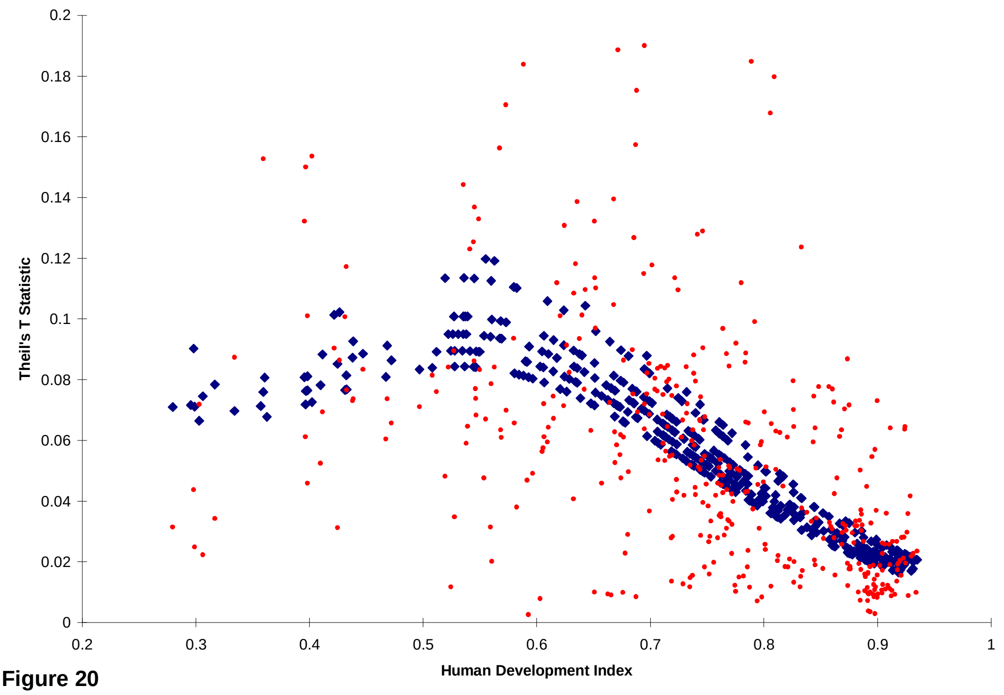

Figure 20

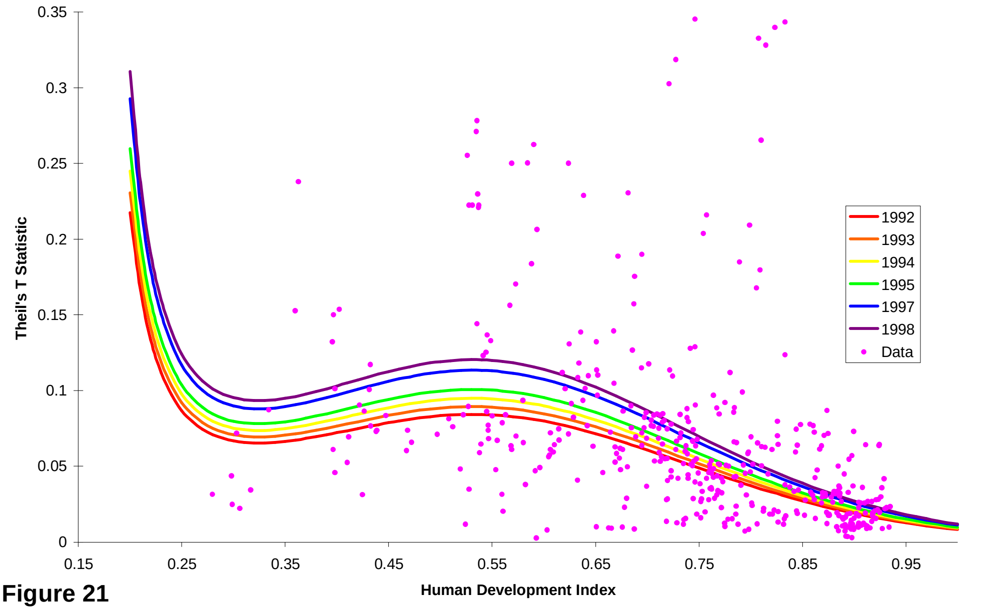

Figure 21

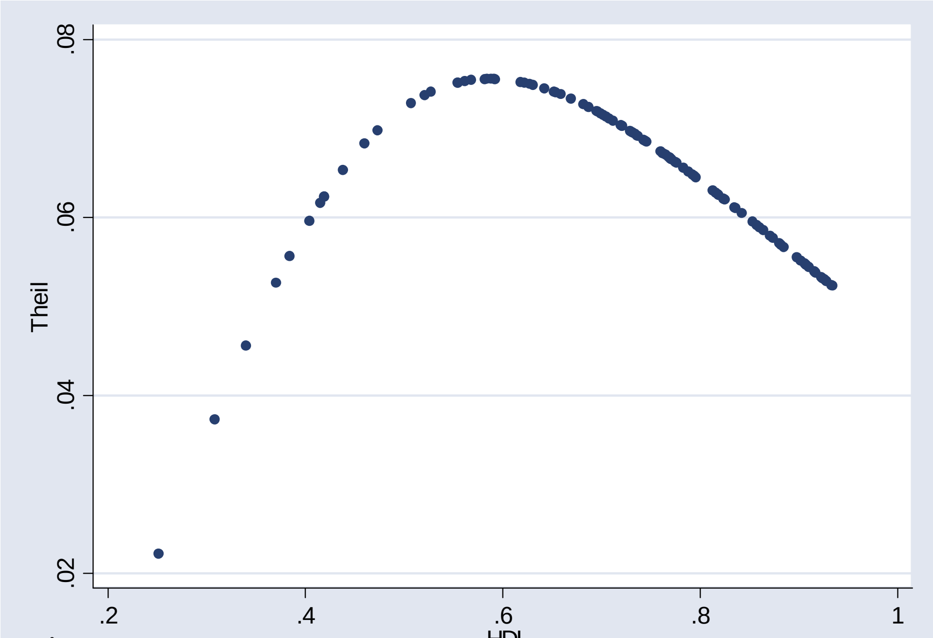

Figure 22

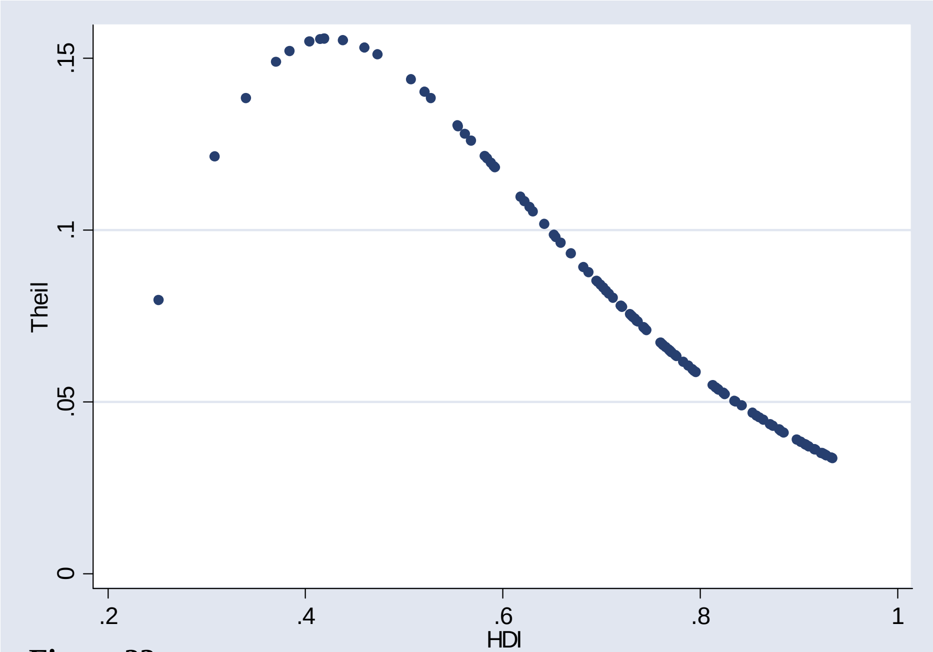

Figure 23

4. Further Research Possibilities

It may not be appropriate to give each country its own fixed effect in this model. A way to provide further research may be to group countries along political, geographical, religious, or development lines. Once this is done the same types of regressions can be run to see if the predictions are consistent with the work done here.

Another possible way to provide additional research in this area would be to attempt to lengthen the data set available. It could also be helpful to look at a long time series of data for a developed country such as the US. The difficulty with this lengthening of the data set is that the HDI hasn’t been published for very long, and has changed methodologies and even the type of data used several times. It may be possible to get the appropriate data from other sources to calculate the HDI for more years than are currently available.

Additionally a Hausman test needs to be performed to test whether fixed effects or random effects is the more appropriate model here.

5. Conclusions

If pooled OLS were an efficient estimator for this model, changing the independent variable to the human development index would change the shape of the Kuznets curve significantly in relation to any curve seen to date. However, assuming that random effects is shown to be the most appropriate of method of estimating this model, the traditional pattern of the Kuznets hypothesis hold when income is replaced with the human development index as the independent variable. This draws sharp contrast to the pattern found by List and Gallet. It appears that an increase in development is accompanied by an increase in inequality at low levels of development followed by a decrease at higher levels.

It should also be noted that there is no causality established here. Because I am analyzing reduced form relationships, I can make no assessment of whether inequality changes cause development or the other way around. All that can be noted is that they seem to be connected in some way and the pattern of that connection.

Even though a great deal of work remains to be done, the initial results are an indicator that there is much to learn from this course of study. It is my hope that this analysis may lead to new perspectives in the topics of development and inequality.

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University of Texas Inequality Project ‘Theil Statistics Computed from the UNDO 2000 Industrial Statistics Database’ http://utip.gov.utexas.edu

Appendix

Table 4[5]*. Yearly Descriptive Statistics*

	Year	*Low Human Development*	*Medium Human Development*	*High Human Development*
HDI	1992	0.399 (0.0631)	0.685 (0.0830)	0.863 (0.0351)
	1993	0.401 (0.0601)	0.686 (0.0816)	0.866 (0.0347)
	1994	0.399 (0.0703)	0.690 (0.0833)	0.874 (0.0359)
	1995	0.411 (0.0674)	0.696 (0.0807)	0.876 (0.0353)
	1997	0.413 (0.0670)	0.701 (0.0803)	0.886 (0.0373)
	1998	0.414 (0.0699)	0.705 (0.0850)	0.887 (0.0399)
Life Expectancy	1992	49.6 (4.31)	67.1 (5.33)	75.7 (2.21)
	1993	49.8 (4.35)	67.3 (5.30)	75.8 (2.20)
	1994	48.4 (6.92)	67.0 (5.84)	76.2 (2.23)
	1995	49.4 (5.50)	67.2 (5.83)	76.3 (2.18)
	1997	49.3 (6.54)	67.4 (6.54)	76.6 (2.01)
	1998	49.6 (6.10)	67.6 (6.77)	76.8 (1.97)
Adult Literacy	1992	43.0 (14.6)	81.9 (17.1)	95.2 (5.97)
	1993	43.8 (14.8)	81.8 (16.1)	95.3 (5.83)
	1994	44.9 (15.1)	82.3 (15.8)	95.6 (5.61)
	1995	45.3 (14.8)	83.6 (14.3)	95.8 (5.29)

[5] Standard deviations in parentheses

	Year	*Low Human Development*	*Medium Human Development*	*High Human Development*
	1997	46.4 (14.5)	84.4 (13.5)	95.8 (5.47)
	1998	47.3 (14.6)	84.7 (13.0)	95.8 (5.40)
Gross Enrolment Ratio	1992	33.7 (11.9)	64.8 (10.6)	79.1 (8.49)
	1993	34.3 (11.4)	65.5 (10.6)	80.1 (8.68)
	1994	36.2 (12.8)	66.0 (10.7)	81.2 (9.04)
	1995	34.9 (14.6)	66.4 (10.8)	80.8 (9.54)
	1997	37.7 (14.9)	67.5 (11.0)	84.8 (10.6)
	1998	38.3 (14.3)	68.1 (11.2)	86.4 (12.0)
Per Capita GDP	1992	1,127.7 (546.1)	4,062.1 (2,293.3)	16,494.9 (4,622.2)
	1993	1,078.9 (444.4)	4,099.2 (2,911.2)	16,913.4 (4,608.3)
	1994	1,115.8 (477.2)	4,418.6 (2,965.7)	18,086.4 (5,584.8)
	1995	1,202.4 (484.0)	4,538.0 (3,110.4)	18,724.5 (5,604.0)
	1997	1,163.8 (409.0)	4,111.9 (2,241.7)	19,755.0 (5,537.6)
	1998	1,111.5 (434.9)	4,825.3 (3351.1)	19,597.6 (5512.4)

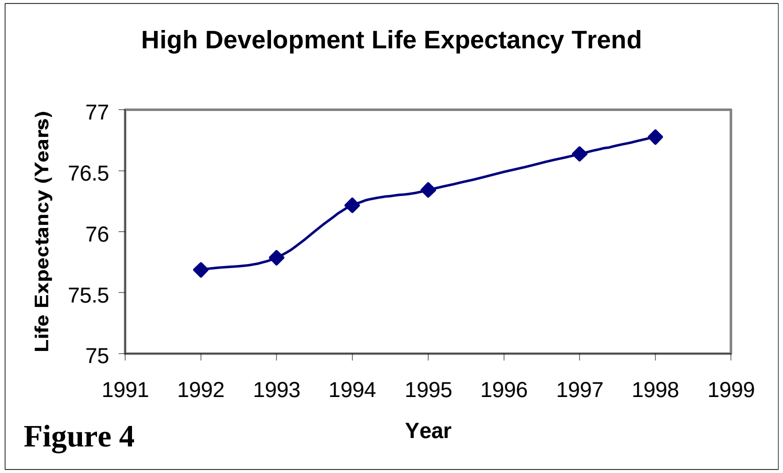
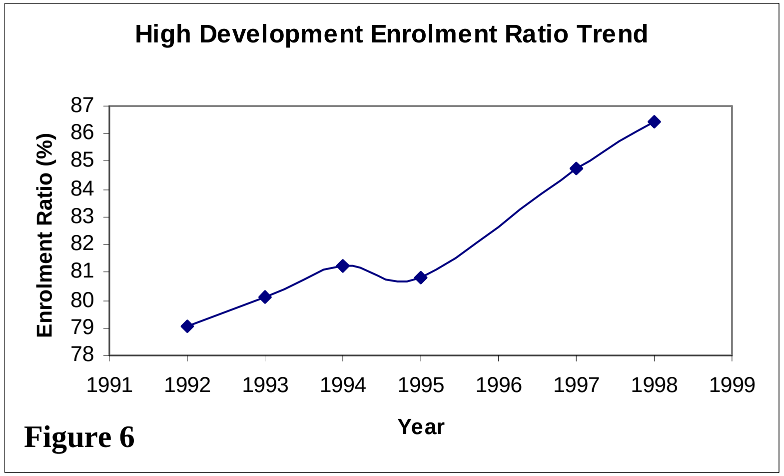


Figure 4



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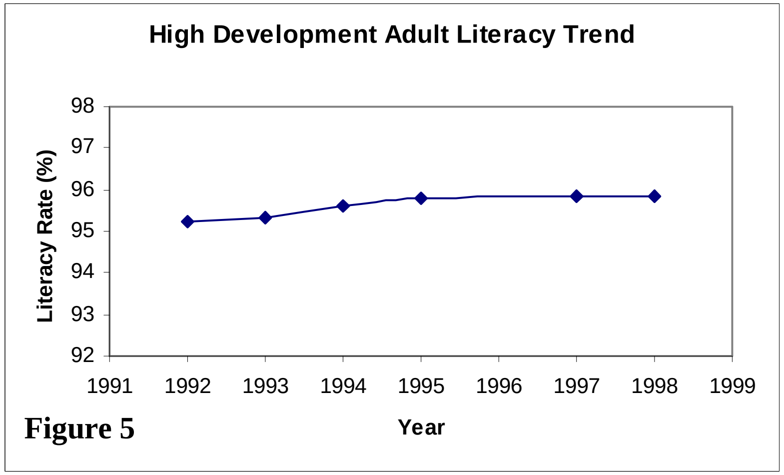

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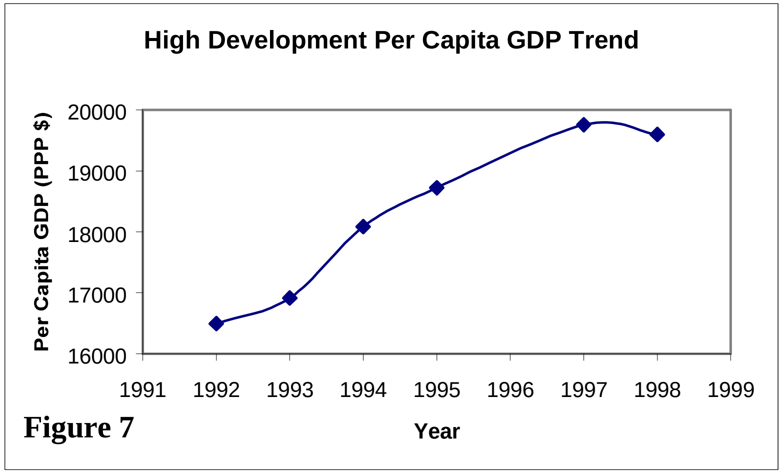

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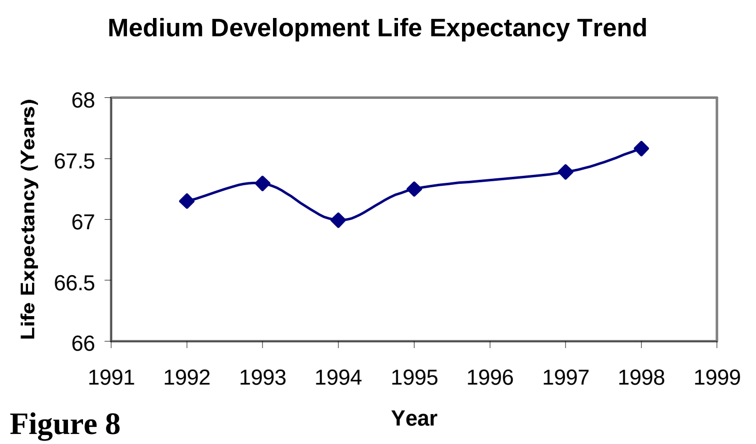

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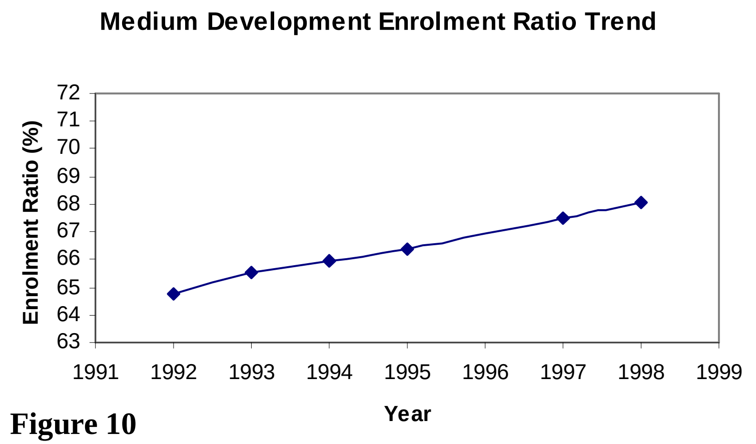

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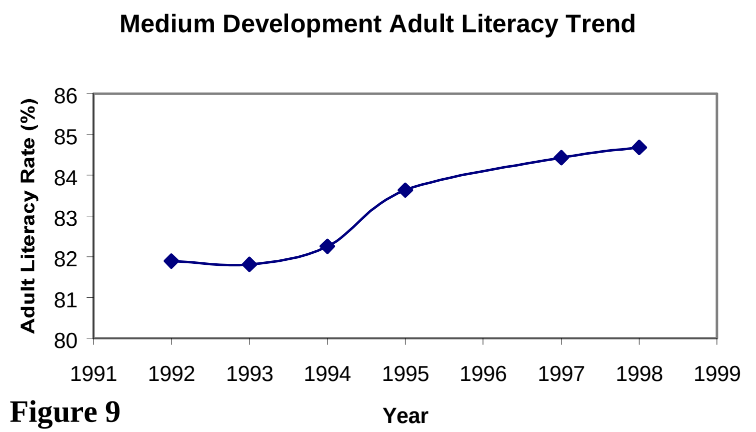

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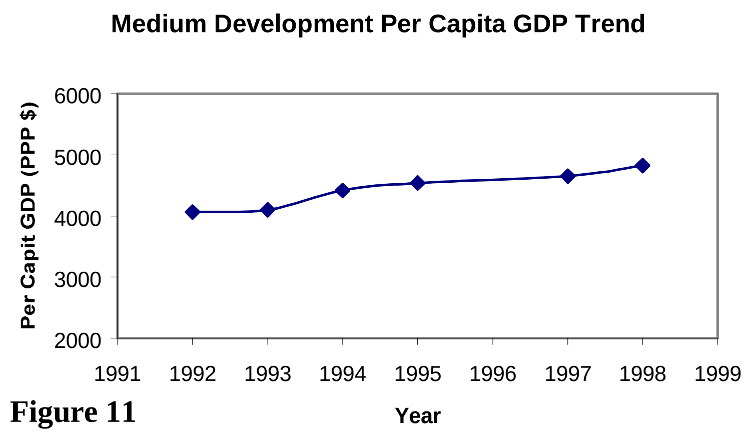

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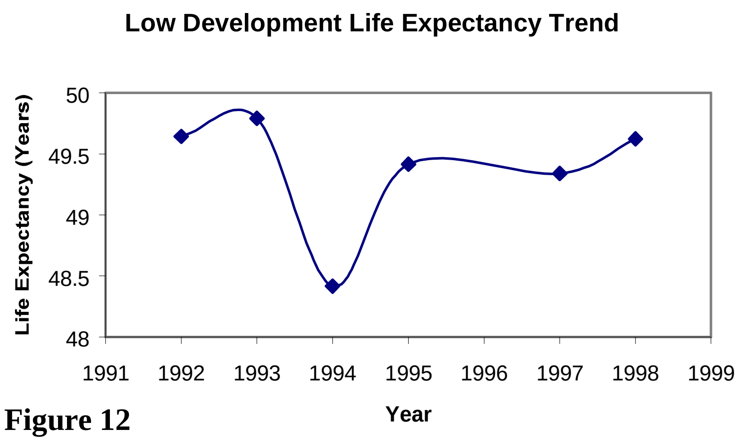

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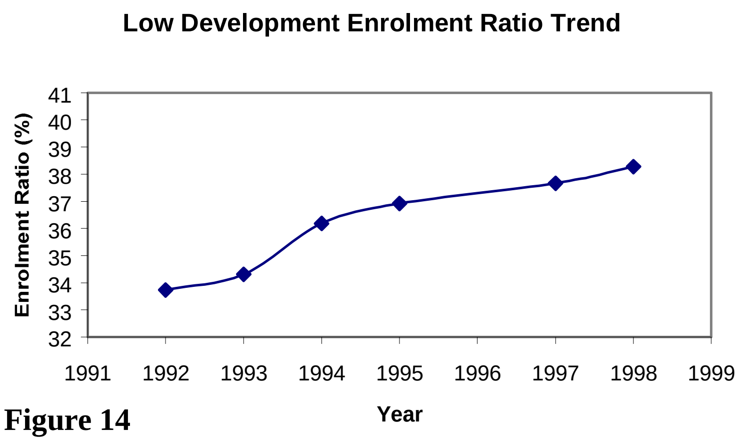
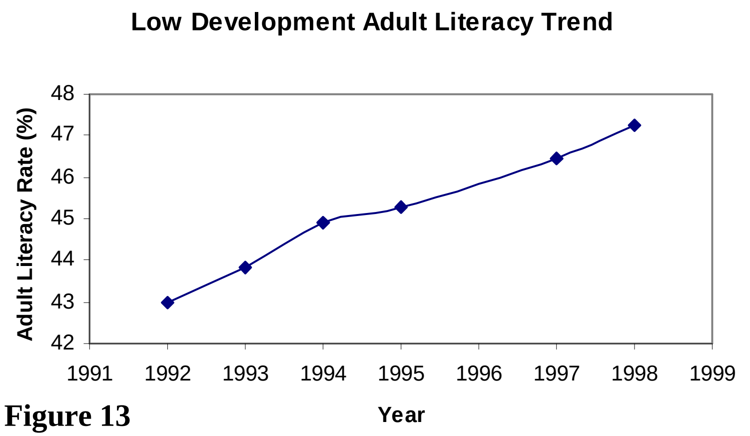


Figure 14



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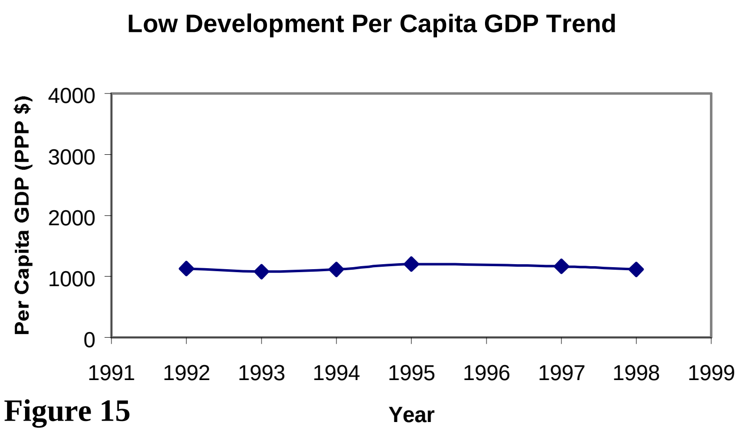

Figure 15

Table 7. Yearly Descriptive Statistics

Variable	*2.2.1*	*Mean*	*Minimum*	*Maximum*	*# of Obs.*
Theil's T statistic	1992	0.0739 (0.0825)	0.0025	0.4195	94
	1993	0.0870 (0.131)	0.0036	1.0257	95
	1994	0.0853 (0.114)	0.0029	0.8798	94
	1995	0.0823 (0.0869)	0.0092	0.4918	76
	1997	0.0684 (0.0669)	0.0089	0.3432	58
	1998	0.0473 (0.0249)	0.0099	0.1097	27
HDI	1992	0.7033 (0.156)	0.2796	0.9184	107
	1993	0.7053 (0.155)	0.2955	0.9201	108
	1994	0.7109 (0.156)	0.2489	0.9298	110
	1995	0.7168 (0.153)	0.2590	0.9312	111
	1997	0.7216 (0.159)	0.2539	0.9315	111
	1998	0.7252 (0.160)	0.2520	0.9350	111