THE KUZNETS CURVE AND THE IMPACT OF VARIOUS INCOME SOURCES ON THE LINK BETWEEN INEQUALITY AND DEVELOPMENT*

by

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Abstract

To understand the process described by the Kuznets curve a decomposition of the Gini Index by income sources is used that emphasizes the role of three components measuring the impact of the shares of the sources, the degree to which they are unequally distributed and their correlation with total income. The rising section of the Kuznets curve is mainly the consequence of the increasing share of wages while the declining section is related to the declining share of entrepreneurial income and the negative correlation between transfers and total income. The data sources were provided by the International Labour Office.

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1. Introduction

More than forty years ago, in his Presidential Address to the American Economic Association, Kuznets (1955) suggested that income inequality was generally rising in the early stages of economic development. In the latter phases of the development process, inequality declines, he argued, and this hypothesis of an inverted-U relationship between inequality and development has since been known as the Kuznets Curve.

There have been numerous empirical investigations testing Kuznets' conjecture and in recent years an abundant literature has appeared which tries to give theoretical foundations to Kuznets' proposition.

This study represents another attempt to check the validity of Kuznets' thesis. The originality of the present paper is essentially methodological. A decomposition technique is suggested that allows to determine the exact effect of each income source on overall income inequality, in the different stages of the development process. As will later be shown, such an impact is related not only to the weight of the income source in total income but also to the degree to which it is unequally distributed as well as to the extent to which it is correlated with total income. Each of these specific effects will be identified and its magnitude during the development process estimated. An empirical illustration is then presented that is based on data recently published by the International Labour Office and giving for various countries the distribution by income classes of the different income sources.

The paper is organized as followed. We first review the theoretical literature and the empirical studies related to the Kuznets Curve. Then we recall how inequality, when measured by the Gini Index, may be decomposed by income source and we suggest a way to break down the difference between the income inequality observed in a given country and the average degree of inequality observed in the sample of countries into three components: the contributions of differences between the shares of the various income sources in this country and in the sample, between the extent to which the various income sources are unequally distributed in this country and in the overall sample and finally between the degree to which total income and the various income sources are correlated in this country and in the total sample of countries. Thereafter we apply the technique summarized earlier to the ILO data which have been used, check whether a Kuznets Curve may be derived from these data and analyze the link which exists for each income source between the three contributions derived previously and the level of per capita GDP. We are thus able to shed some new light on the so-called Kuznets process, that is on the relationship between inequality and development.

2. A Quick Survey of the Theoretical Literature on the Kuznets Curve

Following Kuznets' (1955) pathbreaking study numerous authors in the 1960s and 1970s attempted either to formalize Kuznets' hypothesis or to check its empirical validity. In the early 1980s interest in the link between income inequality and development declined. In recent years, however, there has been a clear resurgence of research in this field, essentially for three reasons: the appearance of the so-called "new growth" theories, the application of the theory of public choice to new areas and the availability of more sophisticated data sets. This section will present a quick and non-exhaustive review of the various theoretical explanations for the existence of the Kuznets Curve while references to empirical studies on this subject will be given in section 3.

We will successively examine three types of approaches. The first one draws on Kuznets' work and emphasizes the implications for inequality and development of the existence of a dual economy. The second type of studies belongs to the "new growth" school and stresses mainly imperfections in the capital market, the role of investment in human capital and the so-called demographic transition. There is, finally, a third category of models which emphasizes either the role of social choices as consequences of the political system or the effect of institutional constraints which are essentially the product of history.

Kuznets' Approach and Dual Economy Models

The earliest model of this type was proposed by Kuznets (1955) who showed that "even if within-sector inequality is constant and the ratio of mean sectoral incomes is also constant, the shift of population between sectors at first produces a widening in inequality and then a narrowing" (Adelman and Robinson, 1989). While Kuznets (1955) used a numerical example, Robinson (1976) provided a more rigorous proof of Kuznets' hypothesis and his demonstration was based on the existence of intersectoral differences in mean income and did not require a higher average income or a greater level of inequality in the growing sector.

Fields (1980) considerably extended this approach by making a distinction between a sector enlargement effect, a sector enrichment effect and an interaction terms. More details on this type of model are given in Adelman and Robinson (1989) in their survey of income distribution and development.

Bourguignon (1990) proposes an interesting extension of the dual model of development in so far as the latter is stated in general equilibrium terms and hence takes into account changes in

internal terms of trade (e.g., as the proportion of the population employed in the traditional sector decreases, the relative price of traditional goods is likely to rise). Moreover, in Bourguignon's analysis the emphasis is put on the Lorenz Curve and not on a specific inequality index as two indices may yield different conclusions as to the link between inequality and development.

The paper by Bourguignon and Morrisson (1990) is also an interesting contribution to the literature on the Kuznets Curve although it is not a dual economy model. In it the empirical investigation is based on a consistent theoretical framework stressing the importance of factor endowments, their ownership structure and foreign trade distortions: "Developing countries which are comparatively well endowed with mineral resources and land (climate) tend to be less egalitarian than others, although the effect of the agricultural comparative advantage may be offset by the distribution of land" (Bourguignon and Morrisson, 1990, p. 1127-28). Trade protection is another crucial variable and it leads to a worsening of the income distribution. The most important conclusion, however, is that it is the presence of exportable resources rather than GDP per capita which is an essential determinant of the income distribution, the reason being, evidently, that natural resources of this type have usually been concentrated among a few owners. In more recent periods, however, these resources have often been publicly appropriated, hence the changing level of income inequality over time.

New Growth Models and the Kuznets Hypothesis

In recent years numerous papers have attempted to analyze the implications of the so-called new growth theories for the link between inequality and development.

Some papers analyze the consequences of imperfections in the capital market. Banerjee and Newman (1990), for example, combine the theory of incomplete markets and insurance and the neoclassical theory of growth with altruism and it appears that their model may be consistent with the Kuznets hypothesis. In Aghion and Bolton's (1992) study the emphasis is rather on the declining rate of interest as the economy accumulates capital (and grows) so that at some stage it may be possible for the poor to obtain loans, a process which ultimately may lead to a decrease in inequality.

Other models stress the role of investment in human capital. Galor and Tsiddon (1996), for example, show that an unequal distribution of human capital (and hence income) may originally be a necessary condition for investment in human capital to occur while later on there is a trickle

down of the accumulated knowledge to the lower segments of society so that ultimately inequality decreases.

Another strand of new growth models stresses the role of demographic factors. Dahan and Tsiddon (1996), for example, argue that the original decrease in mortality rates in the demographic transition implies a decrease in the cost of child rearing per living child. This in itself leads to an increase in the number of children both among the poor and rich people but the number of rich increases at a slower rate so that the wage of the poor declines and that of the rich increases. At some stage the wage gap between rich and poor becomes large enough to encourage investment in human capital among some of the poor and income distribution becomes less unequal and this change occurs at the same time as fertility declines.

Social Choices and the Kuznets Curve

In this type of model the emphasis is on the interaction between the economic structure and the political mechanism.

Most of the early models of this type assumed that political participation was exogenously given. Some models assumed that growth was a consequence of investment in physical capital or of the accumulation of knowledge useful for technical progress while others put the emphasis on education, on public education more precisely. In all these models the causality runs from redistribution to growth rather than from GDP per capita to income inequality.

For Alesina and Rodrik (1994) government revenue from taxation is spent on productive services so that the pretax marginal product of capital rises as the tax rate increases. However, a lower fraction of it can be appropriated by private agents so that these opposite effects may explain the inverted-U relation between taxes and growth.

In Persson and Tabellini's (1994) study taxes are only used for redistributive purposes. A higher tax rate depresses the after-tax return to private investment and hence growth so that income inequality is negatively correlated with subsequent growth.

In St-Paul and Verdier (1993) taxes are used for public education, the main determinant of growth, so that there is a positive correlation between growth and public expenditures on education and at the same time the income distribution becomes more equal.

In Perotti (1992) growth is a consequence of private investment in education and a distinction has to be made between poor and rich economies. In the former since the relative

cost of higher education decreases with per capita income, only the upper income class can potentially invest in human capital. But, to bring about such an investment, the median voter has to implement a smaller redistribution than he would normally find optimal and this is likely to occur only if the middle class is not too distant from the high income group. In rich economies, on the contrary, high growth will exist only if the low income class also invests in education so that enough redistribution takes place in its favor, but this happens only if the median voter, and as a consequence, the middle class, is not too much richer than the low income class. It is clear that such a process may generate a Kuznets' inverted-U curve.

More recently some models have attempted to endogenize political participation. In Bourguignon and Verdier (1996) political participation depends solely on the educational level and human capital accumulation is the determinant of growth. A distinction is then made between two types of societies. In poor and inegalitarian societies oligarchies tend to persist because the fixed cost of education is high relative to the mean income of the population and also because giving away political control through redistribution is very costly. But, in oligarchies which are more affluent and (or) less unequal, the transition to democracy is easier and economic growth will be made possible by the development of education.

Gradstein and Justman (1997) also present a model where, in the early stages of development, a small fraction of the upper income classes controls the political process so that a regressive redistributive policy occurs. Then economic growth leads to an expansion of political participation and ultimately a progressive redistributive policy will take place and inequality will be reduced.

Finally, in Milanovic (1994) the emphasis is more on institutional constraints related to historical developments such as the extent of regional inequality in per-capita income or the importance of the state sector. The latter, for example, will tend to reduce inequality because there exists, usually, less dispersion in wages in the public than in the private sector.

3. Empirical Studies of the Relationship between Inequality and Development

Most of the empirical literature on the Kuznets Curve has been based on cross-country estimations of the relationship between inequality and per capita national income (e.g., Adelman and Morris, 1973; Paukert, 1973; Ahluwalia , 1974, 1976a, 1976b; Ahluwalia et al, 1979; Anand and Kanbur, 1973a, 1973b; Tabatabai, 1974). Several measures of income inequality have been used in these empirical investigations (the percentage income share of the poorest 40%, Theil's two entropy indices, the squared coefficient of variation, the Gini Index or its logit transform, the Atkinson Index or one of its decomposable transforms, the variance of the logarithm of income). The present section will mainly emphasize studies based on the Gini Index as it is the measure we have used in our investigation.

These empirical studies have also used various kinds of functional forms to test for the Kuznets hypothesis, the inequality measure being regressed on per capita income and its inverse or on per capita income and the inverse of the logarithm of income, etc. In a recent study Anand and Kanbur (1993a) have shown that each inequality index generally had a corresponding functional form of the inequality-development relationship. These functional forms were derived on the basis of the two-sectors model which originally inspired Kuznets (1955). Anand and Kanbur (1993a) also stressed that the functional form they derived for the Gini Index was valid only in the case of non-overlapping sectoral income distributions. In such a case they suggested to regress the Gini Index on per capita GDP and on its inverse. More precisely:

$$G = a + b\mu + c(1/\mu) \tag{1}$$

where G is the Gini Index and μ the per capita GDP. It is easily observed that when there is a turning point, the per capita GDP, μ^* at the turning point is such that

$$\mu^* = \sqrt{c/b} \tag{2}$$

The empirical investigation of Anand and Kanbur (1973a) gave for μ^* a value of \$421 (1970 US dollars) when they used a sample of 60 countries including both developing and developed counties. In 1985 this turning point would correspond to a per capita GDP of \$1168, on the basis of the US consumer price index.

Tabatabai (1994) used as dependent variable the logit transform of the Gini Index and his results give, at the turning point, a per capita GDP at 1985 international prices of \$1,565 when the Gini Index measures the inequality between households and of \$2,422 when it measures the inequality between persons. The first case is based on 98 observations, the second on 52.

Fields and Jakubson (1994) use a combination of cross-section and panel data which includes thirty-five countries with one to nine observations per country. They first present a "pooled model" where all the data are treated as a single cross-section while in a second stage they present a "fixed effects model", the idea being that different countries may lie on Kuznets curves which have the same shape but different intercepts.

They find out that in the pooled model inequality rises in the early stages of economic development while the fixed effects model always shows a negative relationship between income inequality and the level of development. These results remain robust enough not to be affected by changes in the definitions of the level of development or of the recipient unit (households versus individuals), by the addition of other countries or by several modifications of the econometric specifications. Fields and Jakubson (1994) believe that their findings may be related to the fact that in Latin American countries inequality is usually high while their per capita GDP lies in the middle of the range of countries usually included in such studies. This might explain why the inverted *U* curve does not show up in their fixed-effects model.

Bruno, Ravallion and Squire (1996) present a careful review of the empirical evidence on the link between inequality and growth. They argue that it is an error to rely on cross-country data sets to draw conclusions concerning the existence of the Kuznets Curve. First, such data ignore country-level determinants of inequality. For example, past inequality is likely to be correlated with current inequality and this in itself is a source of biased estimates. Bias could also arise from differences in the type of data. Some studies, for example, combine income and consumption data. However, because of consumption smoothing, income inequality is usually higher than consumption inequality. Since for Latin American countries one usually had income data while for Asian countries, in the sixties, one had consumption data, one should not be surprised to derive an inverted U-curve linking inequality and per capita income. Bruno, Ravallion and Squire (1996) indeed stress that, when using cross-section data covering the 1980s, that is, once Asian countries had, on average, a much higher per capita income, there was no more evidence of an inverted U-curve.

Concerning the evidence from time series, Bruno, Ravallion and Squire (1996) argue that no clear trend emerged from a careful analysis of Indian data which included 33 household surveys covering the period 1951 to 1991. There was, eventually, a downward trend until the mid-1960s. When running the Anand and Kanbur (1993) test equation appropriate to the Gini Index, they derived even an ordinary U-curve, although one which declines most of the time.

Finally, when combining time series and cross-section data, Bruno, Ravallion and Squire (1996) found that 92 percent of the variance in Gini indices by country and date is a consequence of cross-section variations while only 7 percent is accounted for by variation over time.

More recently Ram (1997) used data on income distribution compiled from the compilation prepared by Deininger and Squire (1996). His database corresponds in fact to the "high quality" subset of 19 developed countries that was identified by Deininger and Squire and includes observations which are comparable over time and across countries. Using a fairly standard Kuznets-type quadratic, Ram handled the cross-country heterogeneity problem by estimating fixed-effects panel-data models that included country-specific dummy variables. His major conclusion is that the pattern observed in the developed world is quite similar to that noted for the U.S. Income inequality shows an uninverted U-pattern in so far as it declined during the 1950s and 1960s but started to increase in the 1970s.

List and Gallet (1999) used a broader database, a panel dataset of 71 countries which included a mix of lower-developed and higher-developed countries, over the 1961-92 period. They found that for lower-developed to middle-developed countries, the Kuznets curve is indeed an inverted U-curve. For higher developed countries, however, the relationship between income inequality and per capita income becomes positive again. These authors suggested that this renewed positive relationship might rest on the shift away from a manufacturing base towards a service base in these countries. Since Bishop, Formby and Thistle (1991) had argued that the service sector is characterized by bimodal pay scales, a consequence of the premium placed on education, a shift towards a service base is likely to generate a greater dispersion in incomes.

Though limited to the US, Tribble's (1999) study covered the 1947-1990 period and confirmed the findings of List and Gallet (1999) in so far as he also concluded that the GNP-inequality relationship is better explained by a S-curve hypothesis than by Kuznets' inverted U-curve or by the U-curve proposed by others. Tribble's S-curve identifies therefore two critical turning points in the per capita GNP-inequality relationship. Prior to the first turning point the story is that of an agriculture-to-manufacturing transition with the level of intrasectoral inequality in manufacturing exceeding that in agriculture. In addition the per capita income growth is also higher in the manufacturing sector. Once the surplus of agricultural labor is absorbed into the manufacturing sector, the first turning point is achieved with wages growing in both sectors and inequality declining. Similarly the second critical turning point is reached when the level of intrasectoral inequality in the newly emergent service sector begins to exceed the

level of intrasectoral inequality in the manufacturing sector which can now be considered as the traditional sector. Beyond this second critical turning the per capita income growth in the service sector exceeds that in the manufacturing sector.

Whereas all these studies looked at the link between the Gini Index of total income and per capita GDP or income, it might be worthwhile to see whether collecting information on sources of income reveals some interesting pattern. The next sections will show how such information may be used.

4. The Decomposition of Income Inequality by Income Source in a Given Country: The Methodology

Let X_{ji} denote the value of income i to individual j and let $X_{.i}$ and $X_{j.}$ be respectively defined as

$$X_{.i} = \sum_{j=1 \text{ to } n} X_{ji} \tag{3}$$

and

$$X_{j.} = \sum_{i=1 \text{ to } I} X_{ji} \tag{4}$$

where I represents the total number of income sources and n the number of individuals.

Let also S_{ji}, $S_{.i}$ and $S_{j.}$ be defined as

$$S_{ji} = X_{ji} / X \tag{5}$$

$$S_{.i} = X_{.i} / X \tag{6}$$

$$S_{j.} = X_{j.} / X \tag{7}$$

where X represents the total income of the population (all sources combined). $S_{.i}$ represents therefore the weight of income source i in total income X while $S_{j.}$ denotes the share of individual j in total income.

Following Silber's (1989) analysis of the decomposition of income inequality, it is possible to define the Gini Index I_G of overall income inequality as:

$$I_G = [e'] \, G \, [S] \tag{8}$$

where $[e']$ is a 1 by n row vector of population shares, each equal to $(1/n)$, $[S]$ is the n by 1 column vector of the income shares $S_{j.}$ and G is a n by n square matrix whose typical element g_{hk} is equal to 0 if $h = k$, to -1 if $h < k$ and to $+1$ if $h > k$. Notice that in (7) the income shares $S_{j.}$ are ranked by decreasing value of the total income (all sources combined) of the various individuals.

Combining (7) and (8) we then derive that

$$I_G = e' \, G \{ [S_{j1}] + [S_{j2}] + \ldots + [S_{ji}] + \ldots + [S_{jI}] \} \qquad (9)$$

Note that in (9) the terms $[S_{ji}]$ on the R.H.S. of the *G*-matrix represent, in fact, column vectors whose typical element is equal to S_{ji}. In other words, (9) may be written as

$$I_G = e' \, G \{ \sum_{i=1 \text{ to } I} [S_{ji}] \} \qquad (10)$$

where $[S_{ji}]$ is a n by *1* column vector containing the *n* shares S_{ji} of the income source *i*.

Let now V_{ji} represent the share $(X_{ji} / X_{.i})$ of individual *j* in income source *i*. Expression (10) may then be written as:

$$I_G = e' \, G \{ \sum_{i=1 \text{ to } I} S_{.i} \, [V_{ji}] \} \qquad (11)$$

$$I_G = \sum_{i=1 \text{ to } I} S_{.i} \{ [e'] \, G \, [V_{ji}] \} \qquad (12)$$

where $[V_{ji}]$ represents the *n* by *1* vector of the shares V_{ji}. Remember, however, that in the vector $[V_{ji}]$ the shares V_{ji} are ranked not by decreasing value of the shares $(X_{ji} / X_{.i})$ but by decreasing values of the shares $S_{j.} = (X_{j.} / X)$. The shares V_{ji} may therefore not be monotonically decreasing so that the product $[e'] \, G \, [V_{ji}]$ is known as the Pseudo-Gini of income source *i*. Let $[y_{ji}]$ represent the vector of the shares $(X_{ji} / X_{.i})$ when the latter are ranked by decreasing values. The product $[e'] \, G \, [y_{ji}]$ represents then the Gini Index of inequality of income source *i* among the various individuals. Following Silber (1993) and using (12), we may then define the index I_G of overall income inequality as:

$$I_G = \sum_{i=1 \text{ to } I} S_{.i} \{ [e'] \, G \, [y_{ji}] \} + \sum_{i=1 \text{ to } I} S_{.i} \{ [e'] \, G \, [V_{ji} - y_{ji}] \} \qquad (13)$$

The first term on the R.H.S. of (13) is the weighted sum of the values of the Gini index for the various income sources, the weights $S_{.i}$ being equal to the share of income source i in the total income in the population. The second term on the R.H.S. of (13) is a permutation component which is equal to the weighted sum of the difference between the values of the Pseudo-Gini and the actual Gini index for the various income sources. This permutation component is therefore a consequence of the fact that the ranking of the different individuals may vary from one income source to the other.

5. The Breakdown of the Difference in Income Inequality in a Given Country and in the Overall Sample of Countries

Using the notations of Section 4, let us call PG_i and AG_i the Pseudo-Gini and actual Gini Index for source i where, using (12) and (13),

$$PG_i = [e'] \; G \; [V_{ji}] \tag{14}$$

$$AG_i = [e'] \; G \; [y_{ji}] \tag{15}$$

respectively.

Let A and M be additional subscripts referring, respectively, to country A and to the overall sample of countries[1], and for simplicity let S_i (instead of $S_{.i}$) represent the share of income source i in total income.

Using (13) we then derive (see, Flückiger and Silber, 1995):

$$I_{G,A} = \sum_i S_{i,A} \, [\, AG_{i,A} + (PG_{i,A} - AG_{i,A}) \,] \tag{16}$$

$$I_{G,M} = \sum_i S_{i,M} \, [\, AG_{i,M} + (PG_{i,M} - AG_{i,M}) \,] \tag{17}$$

Combining (16) and (17) we may write[2], after some algebraic manipulation, that

$$I_{G,A} - I_{G,M} = \sum_i \, [\, ((S_{i,A} + S_{i,M})/2) \, (PG_{i,A} - PG_{i,M}) \,] + \sum_i \, [\, ((PG_{i,A} + PG_{i,M})/2) \, (S_{i,A} - S_{i,M}) \,] \tag{18}$$

Calling, respectively $\Delta_{i,A}$ and $\Delta_{i,M}$ the differences $(PG_{i,A} - AG_{i,A})$ and $(PG_{i,M} - AG_{i,M})$, we derive that

$$(PG_{i,A} - PG_{i,M}) = (AG_{i,A} - AG_{i,M}) + (\Delta_{i,A} - \Delta_{i,M}) \tag{19}$$

Combining (18) and (19), we conclude, after some additional algebraic manipulations, that

$$I_{G,A} - I_{G,M} = u + v + w \tag{20}$$

where

$$u = \sum_i \, [\, ((PG_{i,A} + PG_{i,M})/2) \, (S_{i,A} - S_{i,M}) \,] \tag{21}$$

$$v = \sum_i \, [\, ((S_{i,A} + S_{i,M})/2) \, (AG_{i,A} - AG_{i,M}) \,] \tag{22}$$

$$w = \sum_i \, [\, ((S_{i,A} + S_{i,M})/2) \, (\Delta_{i,A} - \Delta_{i,M}) \,] \tag{23}$$

It may be observed that u, v and w in equations (21) to (23) give, respectively, the contribution to the total difference between the inequality in country A and in the overall sample, of the differences which exist between country A and the overall sample of countries in the shares of the various income sources, in the inequality within each income source and in the correlation between the Pseudo-Gini and the actual Gini Index of the various income sources.

6. The Contribution of Different Income Sources to Total Inequality

The sample of observations for which we had data on the various income sources included 23 countries whose GDP per capita (see Table 1) varied from $661 (Rwanda) to $12,604 (Federal Republic of Germany), the evaluation being made at 1985 international prices (see Summers and Heston, 1991).[3] There was only one country (Rwanda) with a GDP per capita smaller than $1,000 and there were five countries (Germany, Japan, Denmark, The United Kingdom and the Netherlands) with a GDP per capita greater than $10,000. The data on income inequality and the contribution of various income sources were all collected during the period 1983-1990.

Table 1 gives also the value of the overall (all income sources combined) Gini Index for the various countries. Germany (Gini = 0.128) and Denmark (Gini = 0.166) have the lowest level of income inequality while the highest levels are observed in Brazil (Gini = 0.530) and Vanuatu (Gini = 0.564).

In Table 1 we also present the value of the Gini index for the various income sources, in the different countries. Concerning wages the index is highest in Swaziland (0.566) and Brazil (0.536) and lowest in Turkey (0.188) and Germany (0.201). For entrepreneurial income the Gini index is highest in Vanuatu (0.894) and the Netherlands (0.660) and lowest in Greece (0.106) and the Philippines (0.224). For property incomes the extreme values for the Gini index are observed in Panama (0.924) and Mexico (0.721) one one hand, in Spain (0.183) and Denmark (0.218) on the other.

Concerning the inequality of transfers the highest values of the Gini index are observed in Yugoslavia (0.573) and the Philippines (0.510) and the lowest in Japan (0.078) and Spain (0.133).

Finally, for the other sources of income the extreme values of the Gini index concern Vanuatu (0.880) and Brazil (0.786) for the upper bound and Germany (0.118) and Israel (0.121) for the lower bound.

It appears, therefore, that, whatever the source of income considered, the range of the Gini index is quite wide, high values being observed generally in relatively poor countries and low values in rather rich countries.

In Table 2 we give the share in total income of the different income sources for the various countries. The share of wages varies between 10 to 20% (10.5 in Rwanda and 22% in Pakistan) and 85 to 95% (86% in South Korea and 94% in Japan). The lowest shares of entrepreneurial income are observed in Japan and Yugoslavia (1%) and the highest in Turkey (50%) and Pakistan (54%). For property income the lowest share is found in Japan (0.3%) and the highest

in Greece (34%). For transfers the lower bound is around 1% (0.9% in Vanuatu and 1.7% in Pakistan) and the upper bound 36% (Yugoslavia). Finally, for other income sources the lowest values are observed in the Philippines (0.03%) and Cyprus (0.08%) and the highest in Mexico (21%) .

Thus, on the whole, it appears that in rich countries the share of wages is high and that of entrepreneurial income low, the reverse being rather true for poor countries. For the three other sources of income the picture is not as clear.

Table 3 combines the results of the two previous tables in so far as it gives the contribution of each income source to total income inequality. Recall (see section 4) that this contribution may be expressed as the weighted sum of the Pseudo-Ginis (see the values of the Pseudo-Ginis of the different income sources in the various countries in Table A-1) or as the sum of two expressions: the weighted sum of the Gini Indices of the income sources and the weighted sum of expressions which measure somehow the degree of correlation between the ranking of the countries for a given income source and their ranking for total income. As indicated in section 4 this correlation term, for each income source, is, in fact, equal to the difference between the Pseudo-Gini and the actual Gini.

Table 4 presents the results of Table 3 in percentage terms, that is, it gives the relative contribution of each income source to total inequality. For wages it turns out that the highest relative contribution is observed for Denmark (111%) and Cyprus (99%) and the lowest for Turkey (11.6%) and Rwanda (13.9%). For entrepreneurial income the highest (relative) contribution is observed in Turkey (65.3%) and Vanuatu (55.7%) and the lowest in Japan (1.2%) and Yugoslavia (1.3%).

The extreme values for property incomes are, respectively, 45.4% (Greece) and 0.6% (Japan) and for other sources 19.2% (Mexico) and the Philippines and Israel (0%). For transfers the strongest contributions are observed in Germany (42.1%) with a negative sign (indicating that transfers decrease total income inequality) and Yugoslavia (51.3%) with a positive sign (indicating that there transfers increase total inequality).

On the whole, the picture is not very clear: most of the time there does not seem to be a clear link between the contribution of a given income source to total income inequality and the level of per capita GDP. One of the reasons is, clearly, the fact that, as indicated earlier, the contribution of a given source is the consequence of several factors: the impact of the share of the sources, the effect of the level of inequality in the distribution of this income source and finally the role of the correlation term defined previously.

In addition, country-specific institutional characteristics (e.g., the relative importance of wages versus entrepreneurial income in a country like Turkey) or problems of definition (the inclusion in one category of private and public transfers) may also blur the link between the contribution of an income source to total inequality and the level of per capita GDP.

7. The HIES Data on Income Sources and the Link Between Overall Inequality and Development

In order to be able to implement the decomposition given by (20) we ran a regression derived from the computation of the first differences corresponding to equation (1). Calling G_h , μ_h and $(1/\mu)_h$ the Gini Index, the per capita GDP and the inverse of the per capita GDP for country h and G_M , μ_M and $(1/\mu)_M$ the arithmetic means of G_h , μ_h and $(1/\mu_h)$ in the whole sample of countries, we derive

$$(G_h - G_M) = b\,(\mu_h - \mu_M) + c\,[(1/\mu_h) - (1/\mu)_M] \qquad (24)$$

Expression (24) is a regression which may be estimated on the basis of 23 observations (the 23 countries for which data are available) where the dependent variable is $(G_h - G_M)$ and the exogenous variables $(\mu_h - \mu_M)$ and $[(1/\mu_h) - (1/\mu)_M]$. The estimates b^* and c^* obtained are by definition equal to those that would be derived from a simple regressions of G_h on μ_h and $(1/\mu_h)$. The results of the latter regression are presented in Table 5. It appears that the value $\sqrt{c/b}$ of the per capita GDP at the turning point is \$2,244. The asymptotic standard error of the turning point[4] was found to be equal to \$770 so that a 95% confidence interval for the per capita GDP at the turning point will range between \$642 to \$3,845. In Figure 1 we plotted the actual and the predicted Gini indices for each county.

Finally, when the dependent variable was the logit transform of the Gini Index rather than the Gini Index itself (see Table 5), the turning point was found to correspond to a per capita GDP of \$2,202, a result quite similar to that observed when the Gini Index is the dependent variable.

Having observed how inequality varies with the level of per capita GDP we will attempt in the next section to understand the impact of the various income sources on this relationship and, eventually, be able to shed some additional light on the process underlying the existence of the Kuznets Curve.

8. The Breakdown of Changes in the Gini Index and the Impact of Various Income Sources on the Relationship between Inequality and Development

In this section we apply the methodology developed in section 5 to analyze the impact of the different income sources on the Kuznets Curve as well as the respective role played by the shares of these sources in total income, the inequality of the distribution of these income sources and, finally, the correlation residual derived earlier in section 5. The basic idea is to combine expressions (20) to (24). In (20), as was just indicated, the differences between the values taken by the Gini Index in a given country and on average is broken down in the sum of three components (impact of the shares and of the Gini Index of the sources as well as of this correlation term), each component being itself the sum of different elements corresponding to the various income sources. In (24) the difference between the Gini Index of a given country and the average value of the Gini index is regressed on the difference between the per capita GDP of the country and the average per capita GDP and on the difference between the inverse value of the per capita GDP of the country and the average of the inverse values of these per capita GDP. Using (24) we have therefore regressed each of the three components on the R.H.S. of expressions (21) to (23) on these two exogenous variables as well as regressed the constituents (corresponding to the various income sources) of each of these three components on the same two exogenous variables[5].

Table 6 summarizes the results of these different regressions by giving in each case the value of the coefficient *b* (of the difference between the per capita GDP of a country and the average per capita GDP) and *c* (of the difference between the inverse of the per capita GDP and the arithmetic mean of the inverse values of the per capita GDP), the *t* -values of these coefficients, and finally, the value of the per capita GDP which would correspond to a turning point, when there was such a point, and the asymptotic standard error of this turning point. Given that in the regression describing the overall Kuznets Curve, the coefficient *b* dominated, in so far as the greater part of the curve was downward sloping (so that the Kuznets Curve is an inverted-*J* rather than an inverted-*U*-curve), we first concentrate on the coefficients *b* (in Table 6). It appears that the inequality in the distribution of the income sources explains 45% of the coefficient *b* corresponding to the Kuznets curve (-1.248×10^{-5} out of -2.728×10^{-5}) whereas the relative contributions of the shares of the incomes sources and of the correlation component are respectively equal to 19% and 35%. For the coefficient *c* the story is relatively similar: the inequality in the distribution of the income sources explain 58% of its value while the shares of the sources and the "correlation" component contribute respectively 15% and 27% to the value

of *c*. Note however that, although the coefficient *c* is significant, the contribution of the three components that have just been mentioned have a low *t*-value so that not too much importance should be given to the differences observed in the value taken by these proportions. Since the coefficient *c* is responsible for the rising section of the Kuznets Curve, we may conclude, at this stage, that, although it is clear that inequality first rises with development, the exact role played by the income shares, the degree of inequality of the various income sources and the correlation between these sources and total income cannot be specified precisely. The second phase of the Kuznets process where inequality decreases with development seems however to be easier to understand: inequality decreases mainly because of what happens to the inequality in the distribution of the various sources, though the shares and the correlation residuals play also a role.[6]

Let us now get some additional insights by looking into more details at the respective impact of the various income sources during each of the two phases.

During the first phase (corresponding to the rising part of the Kuznets Curve), we observe in Table 6 when looking at the determinants of the coefficient *c*, that wages is the only income source whose effect is significant effect. This impact is essentially a consequence of what happens to the share of wages and since the coefficient of the share of wages is negative, the explanation for the rising section of the Kuznets Curve could be as follows: during this phase inequality increases because the share of wages in total income increases and that of other sources (in particular entrepreneurial income) decreases. Since the wages are more prevalent in the urban sector and since (see Table 3) wages are usually more unequally distributed than other income sources, we here have part of the explanation originally proposed by Kuznets: "First, all other conditions being equal, the increasing weight of urban population means an increasing share for the more unequal of the two component distributions ..." (Kuznets, 1955, p. 708).

Table 6 indicates also that the only other impact whose effect is significant and important is that of the Gini index of property income. The inequality of its distribution seems to increase during this first phase and this effect increases the overall inequality.

The declining section of the Kuznets Curve, as indicated earlier, is mainly explained by the coefficient b in expression (24) and Table 6. Since, as mentioned previously, the negative sign of *b* is essentially a consequence of what happens to the Gini Index of the various income sources, Table 6 indicates that here the main role is played by property income and other sources (the coefficients of wages, entrepreneurial income and transfers are not significant). In other words, during this second phase, as per capita GDP increases, property income and other income

sources become less unequally distributed. For the other two elements determining inequality one may note the important role played entrepreneurial income as far as the role of the shares of the sources is concerned and by transfers whose contribution to the Gini-correlation is essential (and significant). These findings may hence be summarized by saying that, during the second phase of the Kuznets curve story, overall inequality decreases because property income and other sources become less unequally distributed but also because the share of entrepreneurial income decreases. Finally transfers however play also a role because they are negatively correlated with total income, hence the additional negative impact on overall inequality.

The overall effect of each source of income shows up in the lower part ("Total") of Table 6. There it is clear that transfers play the most important role as far as the declining section of the Kuznets curve is concerned (see the impact of transfers on the coefficient *b*). For the rising section of the Kuznets curve, the main role is played by wages (see the impact of wages on the coefficient *b*) which are the principal cause for the increasing inequality in the first stages of the development process.

9. Concluding Comments

This paper represents a new attempt to check the validity of Kuznets' (1955) conjecture according to which income inequality first rises but then declines as the per capita GDP increases. The approach taken here was based on the decomposition of the Gini Index by income sources. More precisely a new methodology was proposed in which the difference between the Gini Indices of each country and the average value of the Gini indices was broken down into three components measuring, respectively, the impact of the shares and of the degree of inequality of the distribution of the various income sources as well as the role of the extent of the correlation between these sources and overall income. These three constituents were then regressed on the differences between the per capita GDP and the average per capita GDP as well as on the difference between the inverse of the per capita GDP and the average value of the inverse of the per capita GDP.

This approach allowed us to shed some new light on the inverted-J curve linking per capita GDP and inequality, what is usually called the Kuznets Curve. The rising section of this curve was found to be mainly the consequence of the increasing share of wages (as originally argued by Kuznets), although the increasing inequality of the distribution of property income played also a role. The declining section of the Kuznets Curve observed during the second phase was the consequence of three factors: the rising inequality of property income and other sources, the

decreasing share of entrepreneurial income and the important role played by transfers, an income source negatively correlated with total income. These conclusions were based on data recently collected by the International Labour Office. The sample of countries was however quite small so that it might be worthwhile in future work, as more data become available, to apply the same methodology to a time series or even to a panel of countries, in order to test the robustness of our findings.

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Notes

1. M stands here for the mean value of the variable analyzed.

2.We use here the well-known identity $(ab - cd) = 0.5\ (a+c)(b-d) + 0.5\ (b+d)(a-c)$

3. We also had data on the income sources of five additional countries: Bulgaria, Macao, Mainland China, Tanzania and the United States. However the estimations of Summers and Heston (1991) we used for the 1988 GDP per capita did not give any information on Bulgaria and Macao. We also decided to exclude Tanzania because the data on income inequality referred to 1976, China because the data did not refer to the whole country and the United States because it was an outlier (its per capita GDP was 50% higher than that of the second richest country).

4. See the note in Table 6 for more details on the computation of the asymptotic standard error of the turning point.

5. This is really the original methodological contribution of this paper. Whereas Silber (1989) introduced the use of the G-matrix in the definition of the Gini index while Silber (1993) extended this use to the case where the population weights vary with the income source, Flückiger and Silber (1993) derived the decomposition of the difference in income inequality between two countries, as it is appears in section 5. The novelty of the present paper is that it shows how such a breakdown allows one to estimate the precise impact on the link between inequality and development not only of each income source but also of each of the three components distinguished: the share of each income source, the degree to which it is unequally distributed and the "correlation" between this source and overall income.

6. Given that the Kuznets curve is a reduced-form empirical model, one should really refrain from making causality conjectures. We thank an anonymous referee for stressing this.

Table 1. Per Capita GDP and the Gini Index of Total Income and of the Various Sources

				Gini of Income Source:			
Country	*Year*	*GDP per capita*	*Gini for Total Income*	*Wages*	*Entrep. Income*	*Proper. Income*	*Transf.*	*Other Sources*
ARG	86	4030	0.3754	0.3550	0.4405	0.6215	0.2659	0.3020
BRA	87	4441	0.5299	0.5360	0.4547	0.6094	0.3829	0.7863
CHL	88	4099	0.5144	0.4728	0.5914	0.5239	0.4856	0.6967
COS	88	3800	0.3707	0.3716	0.3523	0.5904	0.2941	0.5608
CYP	90	7858	0.2519	0.3384	0.2252	0.6112	0.2617	0.6697
GER	83	12604	0.1277	0.2011	0.4863	0.2486	0.2589	0.1180
SPA	89	7406	0.2258	0.3959	0.2549	0.1833	0.1331	0.2610
UNK	89	11982	0.4093	0.5193	0.6149	0.3552	0.1697	0.2781
GRE	88	5857	0.2530	0.3348	0.1056	0.3374	0.1348	0.7425
ISR	86	9412	0.3032	0.4126	0.5715	0.2419	0.2816	0.1206
JAP	90	12209	0.2058	0.2110	0.2560	0.4145	0.0777	0.1827
KOR	90	5156	0.3022	0.2828	0.4077	0.4737	0.3723	0.4220
MEX	83	4996	0.4250	0.4529	0.4025	0.7207	0.2754	0.3847
PHI	88	1947	0.3907	0.4601	0.2235	0.5157	0.5102	0.6268
PAK	86	1567	0.3559	0.3708	0.3126	0.4416	0.4824	0.4340
RWA	83	661	0.3127	0.4403	0.2892	0.2518	0.3169	0.5171
SWI	85	2113	0.4779	0.5664	0.4183	0.4100	0.2284	0.4960
TUR	87	3598	0.3994	0.1878	0.5193	0.4790	0.2596	0.1887
VAN	85	1973	0.5636	0.3626	0.8944	0.6512	0.2338	0.8797
YUG	90	4628	0.3985	0.3158	0.6457	0.3596	0.5727	0.1359
DEN	87	12089	0.1660	0.3030	0.5040	0.2177	0.4148	0.1982
NET	88	11468	0.2538	0.3425	0.6600	0.3824	0.4877	0.3939
PAN	84	3569	0.4110	0.4086	0.3557	0.9236	0.2968	0.4546

Table 2. Weights of Income Sources in Total Income

Country	*Year*	*Wages*	*Entrep. Income*	*Property Income*	*Transfers*	*Other Sources*
ARG	86	0.5359	0.3210	0.0156	0.1234	0.0042
BRA	87	0.6188	0.1517	0.0236	0.1158	0.0900
CHL	88	0.4477	0.2273	0.1834	0.1253	0.0163
COS	88	0.6113	0.2272	0.0303	0.0998	0.0314
CYP	90	0.7336	0.0598	0.0286	0.1772	0.0008
GER	83	0.5869	0.0831	0.0954	0.2201	0.0145
SPA	89	0.4984	0.1347	0.1275	0.2296	0.0097
UNK	89	0.6232	0.1067	0.1005	0.1655	0.0040
GRE	88	0.3357	0.1026	0.3401	0.2193	0.0023
ISR	86	0.5622	0.1231	0.1460	0.1224	0.0464
JAP	90	0.9400	0.0100	0.0030	0.0388	0.0082
KOR	90	0.8571	0.0260	0.0277	0.0303	0.0589
MEX	83	0.4902	0.2103	0.0305	0.0561	0.2129
PHI	88	0.4923	0.3198	0.0431	0.1445	0.0003
PAK	86	0.2194	0.5415	0.1285	0.0171	0.0935
RWA	83	0.1052	0.4739	0.1923	0.1392	0.0894
SWI	85	0.5365	0.2227	0.0765	0.1128	0.0515
TUR	87	0.2517	0.5020	0.1346	0.1009	0.0108
VAN	85	0.5679	0.3508	0.0689	0.0090	0.0035
YUG	90	0.4869	0.0084	0.0678	0.3572	0.0797
DEN	87	0.6357	0.0707	0.0366	0.1741	0.0829
NET	88	0.6994	0.0931	0.0378	0.1594	0.0103
PAN	84	0.6109	0.1280	0.0525	0.1276	0.0810

Table 3. Contribution of Each Income Source to Total Inequality

Country	*Year*	*Wages*	*Entrep. Income*	*Property Income*	*Transfers*	*Other Sources*	*Total (Gini)*
ARG	86	0.1903	0.1414	0.0097	0.0328	0.0013	0.3754
BRA	87	0.3317	0.0690	0.0144	0.0440	0.0707	0.5299
CHL	88	0.2117	0.1344	0.0961	0.0608	0.0114	0.5144
COS	88	0.2272	0.0800	0.0177	0.0282	0.0176	0.3707
CYP	90	0.2483	0.0127	0.0174	-0.0269	0.0004	0.2519
GER	83	0.1161	0.0402	0.0236	-0.0538	0.0015	0.1277
SPA	89	0.1973	0.0318	0.0228	-0.0272	0.0011	0.2258
UNK	89	0.3237	0.0655	0.0357	-0.0162	0.0006	0.4093
GRE	88	0.1124	0.0108	0.1147	0.0134	0.0017	0.2530
ISR	86	0.2319	0.0703	0.0353	-0.0343	-0.0001	0.3032
JAP	90	0.1983	0.0025	0.0012	0.0023	0.0014	0.2058
KOR	90	0.2424	0.0106	0.0131	0.0113	0.0249	0.3022
MEX	83	0.2220	0.0846	0.0220	0.0147	0.0817	0.4250
PHI	88	0.2265	0.0715	0.0218	0.0710	-0.0001	0.3907
PAK	86	0.0814	0.1693	0.0567	0.0079	0.0406	0.3559
RWA	83	0.0435	0.1323	0.0477	0.0438	0.0454	0.3127
SWI	85	0.3038	0.0929	0.0313	0.0243	0.0255	0.4779
TUR	87	0.0465	0.2607	0.0645	0.0260	0.0017	0.3994
VAN	85	0.2054	0.3137	0.0442	-0.0014	0.0017	0.5636
YUG	90	0.1538	0.0054	0.0242	0.2046	0.0106	0.3985
DEN	87	0.1848	0.0342	0.0029	-0.0654	0.0094	0.1660
NET	88	0.2314	0.0600	0.0140	-0.0550	0.0035	0.2538
PAN	84	0.2495	0.0444	0.0482	0.0324	0.0366	0.4110
MEAN		0.1991	0.0843	0.0339	0.0147	0.0169	0.3489

Table 4. Contribution of Each Income Source to Total Inequality (in percent)

Country	*Year*	*Wages*	*Entrep. Income*	*Property Income*	*Transfers*	*Other Sources*	*Total*
ARG	86	50.7	37.7	2.6	8.7	0.3	100
BRA	87	62.6	13.0	2.7	8.3	13.3	100
CHL	88	41.1	26.1	18.7	11.8	2.2	100
COS	88	61.3	21.6	4.8	7.6	4.7	100
CYP	90	98.6	5.1	6.9	-10.7	0.2	100
GER	83	90.9	31.5	18.5	-42.1	1.2	100
SPA	89	87.4	14.1	10.1	-12.1	0.5	100
UNK	89	79.1	16.0	8.7	-4.0	0.1	100
GRE	88	44.4	4.3	45.4	5.3	0.7	100
ISR	86	76.5	23.2	11.6	-11.3	0.0	100
JAP	90	96.4	1.2	0.6	1.1	0.7	100
KOR	90	80.2	3.5	4.3	3.7	8.2	100
MEX	83	52.2	19.9	5.2	3.4	19.2	100
PHI	88	58.0	18.3	5.6	18.2	0.0	100
PAK	86	22.9	47.6	15.9	2.2	11.4	100
RWA	83	13.9	42.3	15.2	14.0	14.5	100
SWI	85	63.6	19.4	6.5	5.1	5.3	100
TUR	87	11.6	65.3	16.1	6.5	0.4	100
VAN	85	36.4	55.7	7.8	-0.3	0.3	100
YUG	90	38.6	1.3	6.1	51.3	2.7	100
DEN	87	111.3	20.6	1.8	-39.4	5.7	100
NET	88	91.2	23.6	5.5	-21.7	1.4	100
PAN	84	60.7	10.8	11.7	7.9	8.9	100

Table 5. Regression Results for Kuznets Curve

Explanatory variable	*Dependent Variable*	
	Gini Index of Total Income	*Log of Gini Index over its complement to one*
Constant	0.5522	0.3173
	(9.59)	(1.20)
GDP per capita	-2.7276×10^{-5}	-1.3341×10^{-4}
	(-4.48)	(-4.67)
Inverse of GDP per capita	-137.39	-646.77
	(-1.80)	(-1.81)
N	23	23
R^2 adjusted	0.4720	0.5086
F - statistic	10.83	12.38

Notes: Figures in parentheses are the associated *t* values of the coefficients.

Table 6. Regression Results for Components of the Difference of Gini Index from Overall Mean Values

	Coefficient b	*t value of b*	*Coefficient c*	*t value of c*	*GDP at turning point*	*Asymptotic stand. error of turn. point*
Shares						
Wages	3.2989×10^{-6}	0.95	-123.2570	-2.84	0	0
Entrep.	-7.9787×10^{-6}	-2.27	70.2054	1.60	0	0
Proper.	6.6096×10^{-7}	0.27	30.5896	1.01	0	0
Transf.	-4.2738×10^{-7}	-0.29	-7.2298	-0.39	4113	5144
Other	-7.1539×10^{-7}	-0.54	9.2609	0.55	0	0
Total	-5.1616×10^{-6}	-2.56	-20.4308	-0.81	1990	1438
Gini						
Wages	-6.1906×10^{-6}	-1.56	-7.0630	-0.14	1068	1886
Entrep.	-6.3494×10^{-7}	-0.23	-35.8028	-1.01	7509	7011
Proper.	-3.1768×10^{-6}	-3.24	-32.9166	-2.68	3219	952
Transf.	-1.3060×10^{-6}	-0.84	-3.6327	-0.19	1668	2838
Other	-1.1677×10^{-6}	-1.91	-0.1407	-0.02	347	975
Total	-1.2476×10^{-5}	-2.21	-79.5558	-1.13	2525	1479
Correl.						
Wages	-5.5436×10^{-7}	-4.06	-8.5301	-4.99	3923	759
Entrep.	-2.3961×10^{-7}	-3.15	-2.1183	-2.22	2973	992
Proper.	-2.0237×10^{-7}	-1.56	-0.8364	-0.51	2033	2332
Transf.	-8.5580×10^{-6}	-4.36	-25.8415	-1.05	1738	922
Other	-8.4588×10^{-8}	-0.20	-0.0749	-0.01	941	504
Total	-9.6389×10^{-6}	-4.26	-37.4013	-1.32	1970	870
Total						
Wages	-3.4461×10^{-6}	-0.66	-138.8501	-2.12	6348	2769
Entrep.	-8.8532×10^{-6}	-1.74	32.2843	0.51	0	0
Proper.	-2.7183×10^{-6}	-1.35	-3.1633	-0.13	1079	1508
Transf.	-1.0291×10^{-5}	-3.09	-36.7040	-0.88	1889	1232
Other	-1.9676×10^{-6}	-1.22	9.0453	0.45	0	0
Total	-2.7277×10^{-5}	-4.49	-137.3879	-1.80	2244	770

Notes: The per capita GDP at which a turning point is observed is $\mu = \sqrt{c/b}$, which is a function of the regression coefficients. Let **f(b)** be a linear or nonlinear function of the least squares estimators. The estimator of the asymptotic covariance matrix of **f(b)** is given by: Est. Asy. Var[**f(b)**] = **c**$[s^2(X'X)^{-1}]$**c'**, where **c** is a row vector of the partial derivatives ∂**f(b)**/ ∂**b'**, X is the matrix of the explanatory variables and s^2 is the mean square error of the regression (Greene, 1997, p. 278.).

Table A-1. Pseudo Gini by Income Source

Country	*Year*	*Wages*	*Entrep. Income*	*Property Income*	*Transfers*	*Other Sources*
ARG	86	0.3550	0.4405	0.6215	0.2659	0.3020
BRA	87	0.5360	0.4547	0.6094	0.3801	0.7863
CHL	88	0.4728	0.5914	0.5239	0.4856	0.6960
COS	88	0.3716	0.3523	0.5844	0.2826	0.5608
CYP	90	0.3384	0.2132	0.6077	-0.1517	0.4563
GER	83	0.1978	0.4838	0.2478	-0.2444	0.1051
SPA	89	0.3959	0.2360	0.1786	-0.1185	0.1163
UNK	89	0.5193	0.6143	0.3552	-0.0979	0.1361
GRE	88	0.3348	0.1048	0.3374	0.0610	0.7292
ISR	86	0.4126	0.5715	0.2418	-0.2800	-0.0012
JAP	90	0.2110	0.2477	0.4100	0.0591	0.1744
KOR	90	0.2828	0.4071	0.4717	0.3723	0.4219
MEX	83	0.4529	0.4025	0.7194	0.2611	0.3839
PHI	88	0.4601	0.2235	0.5054	0.4914	-0.2256
PAK	86	0.3708	0.3126	0.4416	0.4644	0.4340
RWA	83	0.4136	0.2791	0.2478	0.3150	0.5079
SWI	85	0.5664	0.4172	0.4084	0.2156	0.4960
TUR	87	0.1848	0.5193	0.4790	0.2580	0.1575
VAN	85	0.3617	0.8944	0.6414	-0.1574	0.4856
YUG	90	0.3158	0.6367	0.3574	0.5727	0.1333
DEN	87	0.2907	0.4840	0.0804	-0.3759	0.1139
NET	88	0.3308	0.6443	0.3702	-0.3450	0.3360
PAN	84	0.4084	0.3467	0.9179	0.2537	0.4519

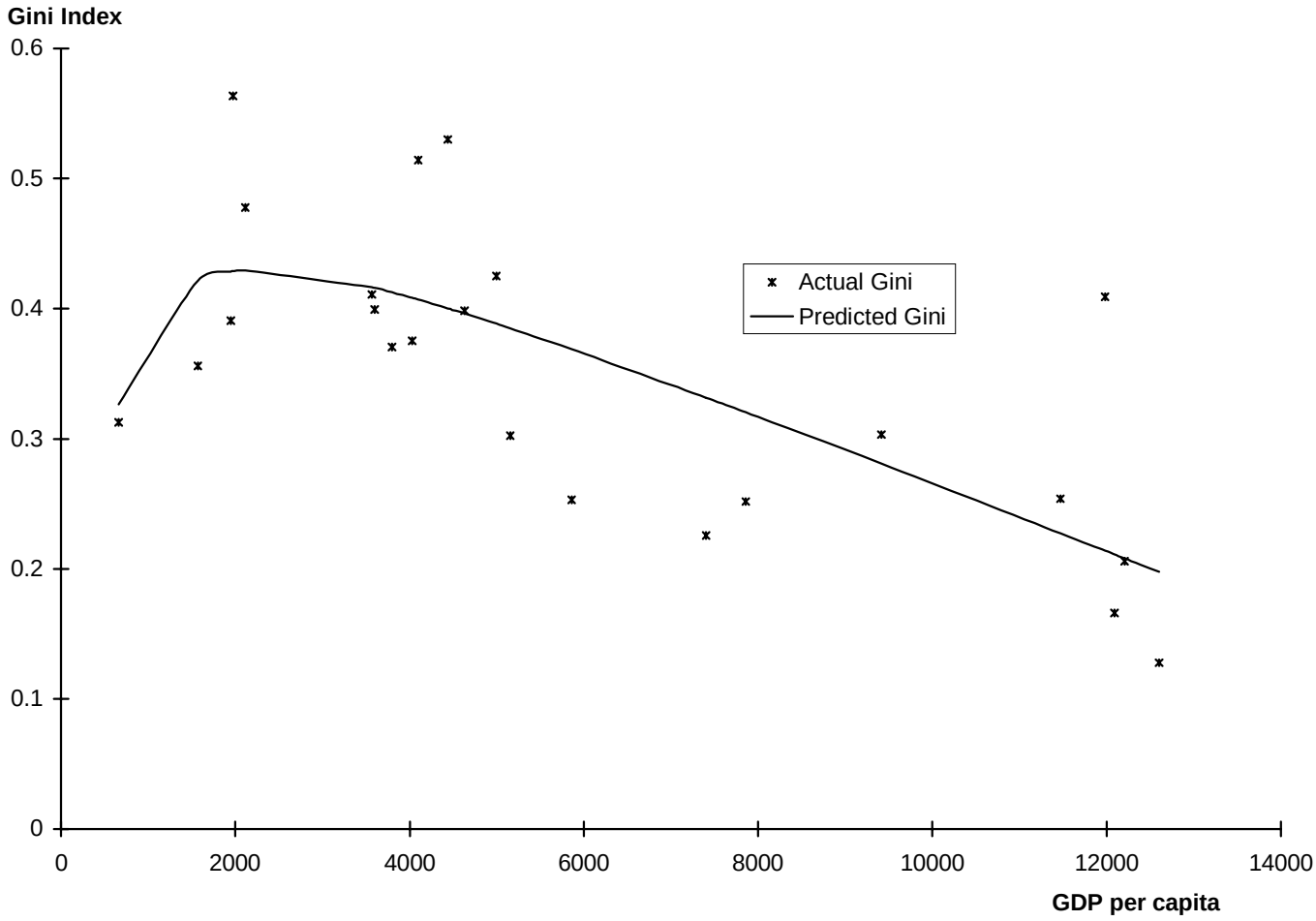

Figure1. The Predicted Kuznets Curve