

# Structural Disarticulation and Third World Human Development

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## ABSTRACT

Structural disarticulation that entails uneven sectoral development has increasingly become one of the biggest stumbling blocks in the Third World development process. Specifically, it has contributed greatly to the lack of correspondence between economic and social development. This article provides a quantitative cross-national assessment of the impact of structural disarticulation on human development. Results indicate that structural disarticulation exhibits a strong negative effect on human development net of (1) the development level; (2) state size and state strength; and (3) major forms of economic dependency such as foreign trade, foreign direct investment, and external indebtedness.

**A**FTER THREE DECADES of striving for economic growth, many countries in the Third World still face the stark reality of wrenching poverty and deteriorating living standards for their growing populations. Poverty continues to haunt the lives of more than one billion people around the developing world, many of them still living without electricity and running water. In light of these facts, development scholars have challenged the notion that economic growth can trickle down to the masses, eradicating poverty and improving general welfare (Adelman and Morris, 1973; Hicks and Streeten, 1979; Streeten, 1984; Bunker, 1989). The slippage between economic growth and improvement of social welfare has spurred considerable interest in redefining development goals, focusing on the well-being of Third World populations. For instance, cross-national research has examined the links between global restructuring and physical quality of life, infant mortality, educational attainment, women's status and fertility, and children's health (see London and William, 1988, 1990; Wimberley, 1990; Stokes and Anderson, 1990; Ward, 1984; Bradshaw et al., 1993).

Recently, the United Nation Development Program (UNDP 1990) has redefined development in terms of "human development", which embraces both economic and social development. The new focus on human development

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is significant as it recognizes the lack of correspondence between economic growth and social progress and tackles the problem that per capita income, the traditional indicator of development, often conceals widespread human deprivation. Higher levels of per capita income do not necessarily translate into higher levels of human development. Brazil, with a GNP per capita over \$2000, and Sri Lanka, with a GNP per capita less than \$400, have drastically different levels of economic development, yet Sri Lanka has achieved a high level of human development, comparable to that of Brazil.<sup>1</sup> Such comparison reveals a clear underlying pattern of Third World development: economic growth does not automatically lead to social progress as indicated by improvement of living standards, health care, and public access to education.

To account for human development, one pivotal contributing factor is that of structural disarticulation, an economic and social feature manifested by uneven sectoral development and lack of correspondence between domestic production and consumption patterns. The presence of high levels of structural disarticulation, typically observed in Third World countries, has a profound negative impact on human development. Under such conditions, economic dynamism is confined to the modern industrial sector, leaving behind a stagnant agriculture sector and generating the "hypertrophy" of the service sector (Amin, 1976; Evans and Timberlake, 1980; Stokes and Anderson, 1990). Such an unbalanced growth pattern signifies a troubled economic and social structure which debilitates Third World countries' ability to achieve sustainable development. Uneven sectoral development results in the economy's inability to absorb the excessive labor force in rural areas, leaving the vast majority of the population with minimum income to sustain their daily living. Moreover, the inability to absorb the majority of the labor force into productive activities leads to weak purchasing power of the masses. This lack of correspondence between production and consumption stifles the driving forces of economic growth, crippling overall economic and social progress (De Janvry, 1983).

This article assesses the impact of structural disarticulation on human development in the Third World. Since structural disarticulation has not been studied extensively from a quantitative perspective (with the exception of Stokes and Anderson, 1990), I start with some conceptual clarifications on the meaning of structural disarticulation, culminating in an operational definition. The issue of measurement is discussed in detail. A quantitative analysis is then carried out to examine the impact of structural disarticulation on human development, controlling for development levels and other social and economic factors such as trade dependency, foreign investment dependence, external indebtedness, state size and state strength. This set of factors are chosen since previous cross-national studies have shown their significant effects on economic growth (Timberlake & Kentor, 1983; Bornschieer & Chase-Dunn, 1985), physical quality of life (Dixon, 1984; Moon & Dixon, 1985; London & William 1988, 1990; Bradshaw and Huang, 1991), infant mortality and life expectancy (Wimberley, 1990), and child mortality, crude death rates, and educational attainment (Stokes & Anderson, 1990). Finally, this article discusses the impli-

cations of the current research and makes suggestions for future inquiry on structural disarticulation.

### **Structural Disarticulation: Conceptual Clarification**

Structural disarticulation is potentially a powerful concept to account for human development in the Third World. Theoretically, Amin (1976) laid the ground work in incorporating disarticulation into the analysis of underdevelopment in poor countries. Empirically, Evans and Timberlake (1980) studied the impact of foreign investment on the overexpansion of the service sector which is a special form of disarticulation. A fuller analysis of the impact of disarticulation on social welfare was provided by Stokes and Anderson (1990). Before discussing the relationship between disarticulation and human development, some conceptual clarifications are needed.

Structural disarticulation refers to a distorted economic and social structure characterized by (1) unevenness in sectoral development; (2) missing linkages among industrial sectors; and (3) lack of correspondence between patterns of production and consumption.

First, disarticulated economies and societies are characterized by *unevenness* of sectoral development in terms of productivity *per worker*. Main economic sectors such as agriculture, manufacturing, service, and construction maintain very different levels of development in contemporary Third World countries. Typically, the agricultural sector which holds the highest proportion of the total labor force, in most cases, lags behind manufacturing industry in its growth and development. Stagnation in agriculture has increasingly become a thorny problem in many less developed countries since the majority of the world's population is poor and the world's poor are largely concentrated in the agriculture sector. Some attribute the slow growth of agricultural productivity to bad economic strategies. Nobel Laureate T. W. Schultz (1987:19) claims that agriculture has been the "victim of more than its share of bad economics." According to Schultz (1987), industrialization has been promoted to the detriment of agriculture; agriculture has been squeezed, disguised unemployment has been tolerated, the farmer's responsiveness to incentives has been ignored, and the declining economic importance of land has not been perceived.

In the past three decades, the excessive and disproportionate growth of the service sector has also exacerbated the problem of unevenness in sectoral development. With a stagnant agriculture and moderately growing manufacturing industry, the rapid growth of the tertiary sector experienced by many LDCs seems out of proportion. Amin (1976) describes such an overexpansion of the service sector as the "hypertrophy of the tertiary sector", fueled largely by increases in the informal economy. This phenomenon, he argues, is a natural result of the bifurcation of Third World economies, with a modern industrial sector and a traditional agriculture sector. The modern sector tends to attract most of the domestic and foreign capital, and they are often located in megacities into which government and policy-makers are especially keen to pour

resources and establish as political, economic, and cultural centers. In their cross-national analysis, Evans and Timberlake (1980) indicate that growth of the tertiary sector is one of the central mechanisms through which foreign capital penetration escalates income inequality. One can further argue that uneven sectoral development constitutes a major part of structural disarticulation, which may be responsible for a variety of social and economic ills in the poor countries.

The second feature of structural disarticulation is the missing linkages among economic sectors. In viable economies, as noted by Hirschman (1958), new industries generate products that can serve as inputs to other industries (i.e., forward linkage); meanwhile their needs for inputs create demand for the products of other industries (i.e., backward linkage). The problem of missing linkages among industrial sectors create tremendous difficulties for the LDCs (Hirschman, 1958). The modern industrial sectors dominated by multinational corporations bring in inputs and technologies from home countries, thus closing the possibility of generating local industries which could otherwise provide the inputs. In most cases, the dynamic modern sectors in the LDCs have a large demand for cheap labor, albeit insufficient to absorb the larger reservoir of the unemployed rural residents. Modern industries also have a demand for raw materials. Yet as Bunker (1985, 1989) observed, extracting raw materials and building infrastructure in the Amazon forests have failed to generate sustainable local business and services. This case is not aberrant; rather it is typical of the less developed world.

The third aspect of structural disarticulation is the lack of correspondence between patterns of production and consumption. As noted by Amin (1976), disarticulated economies in the LDCs are characterized by "extroversion", meaning economic production focuses mainly on exportables and durable goods demanded by foreign markets. When selling in the domestic markets, the prices of these exportables and durable goods are so high that they often outstrip the purchasing power of the vast majority of the population. Such a lack of correspondence between production and consumption patterns in the LDCs does not stimulate consumer spending, inevitably blocking the overall growth of the economy (De Janvry and Sadolet, 1983). This further reduces the wages of the workers, lowering living standards of the most vulnerable populations in the LDCs such as women, children, and rural residents (Adelman and Morris, 1973).

It is important to note that the three features of structural disarticulation are concomitant, that is, they are inter-related to one another. Disarticulated economies with a high degree of uneven sectoral development are often confronted by missing industrial linkages and lack of correspondence between production and consumption patterns. Meanwhile, economic structures that lack inter-sectoral linkages are likely to have uneven development as well. Indeed, structural disarticulation entails these three pronounced features, each representing a specific ramification of a structural condition in disarticulated economies. They are by no means independent from each other. However,

among these three, I argue that uneven sectoral development is the most fundamental aspect and is closely associated with the other two.

### **Structural Disarticulation and Human Development**

The relationships between structural disarticulation and human development can be established on several grounds. First and foremost, structural disarticulation should exert tremendous pressure on the traditional sectors where the majority of the Third World population resides. Slow growth or zero growth rates in traditional sectors such as agriculture drive down overall economic development, leaving millions of rural people impoverished. The tendency for disarticulated economies to restrict growth to only a few capital-intensive sectors creates only small increases in industrial employment, crippling the system's ability to solve the problem of massive unemployment. Without jobs and income, the unemployed in both rural and urban areas are deprived of basic living facilities such as food, shelter, and access to health and educational services. Even for those employed in the modern sectors which offer higher wages compared with working in the farmlands, the economic return remains relatively low given the market value of what they produce (De Janvry and Sadolet, 1983; Stokes and Anderson, 1990). Therefore, structural disarticulation slows down and obstructs the improvement of general welfare due to low overall economic productivity.

Furthermore, structural disarticulation tends to divert government resources from spending in social services and public health. In order to invest more in industrial sectors, governments allocate few resources to education, health care, and women's development, all of which have a direct impact on human development. Recently, many Third World governments have made tremendous cuts in social spending in order to comply with the IMF structural adjustment policies and ensure the IMF loans. Studies have shown that such government budget cuts have drastically lowered the living standards in many developing countries and provoked social unrest (Walton and Ragin, 1989, 1990; Bradshaw and Huang, 1991; Bradshaw et al., 1993; Adelfulu, 1991).

Thirdly, growth under structural disarticulation is likely to perpetuate income inequality, one of the most severe problems facing the developing countries. Since the dynamic, modern sectors produce mostly durable goods with high price tags, the majority of people with low wages cannot afford to purchase these commodities. As a result, the supply and demand relationship is distorted, blocking the feedback between production and consumption. Thus, the dynamics of the modern sector fails to spur further economic growth (De Janvry and Sadolet, 1983). Low growth, in turn, creates low wages and fewer jobs, leaving the mass population impoverished and benefiting only a small elite class who profits from the production and sales in the modern sectors. Under such conditions, structural disarticulation aggravates the problem of income inequality in the poor countries.

Therefore, it is hypothesized in this study that *structural disarticulation has a powerful negative impact on Third World human development*. Moreover, its impact on human development is *independent* of many other known forces influencing the development process in general. To test this hypothesis, this study will show that the negative impact of structural disarticulation on human development is net of (1) the development level, and (2) other social and economic factors. These results, if obtained, shall uncover a new mechanism—structural disarticulation, crucial to a coherent study of Third World development process. It shall also suggest that the research community needs to devote more effort to examining structural disarticulation itself, especially its sources. Although the present study limits its focus to the empirical relationship between structural disarticulation and human development, the sources of structural disarticulation are assessed in separate research (Huang, 1994).

### Measuring Structural Disarticulation

Only one attempt has been made to measure structural disarticulation—a new concept in cross-national research on Third World development. Based on Amin's analysis, Stokes and Anderson (1990:66) define disarticulation as the "juxtaposition of economic sectors with radically different levels of development and productivity." They measure it by taking the sum of the absolute difference between the percentage of distribution in the labor force and the percentage of distribution of national income over seven economic sectors. Careful scrutiny reveals several flaws of their measure. First, their measure does not reflect the meaning of uneven sectoral development embedded in the definition of disarticulation. Uneven sectoral development should be perceived through comparing one economic sector with another in terms of *productivity per worker*. Subtracting the percentage of the labor force in one economic sector from the GDP in one sector as a percentage of the total national output, as they do, does not reflect the idea of productivity per worker. Second, since two components in their index—the percentage of labor force in a given sector and its share of the total GDP, are two different indicators, subtracting one from another amounts to nothing theoretically meaningful. The result of this kind of subtraction is confusing, casting doubt on whether this index really catches the meaning of disarticulation. Consequently, their measure is substantively difficult to interpret.

Based on the operational definition delineated in the previous section, I measure structural disarticulation in terms of the uneven development of various economic sectors. To measure the unevenness of various economic sectors, one is naturally led to the totality of *deviations* of productivity per worker of each economic sector from the average productivity per worker in the overall economy.

More specifically, let  $G_i$  and  $L_i$  be the percentage of GDP and labor force respectively in sector  $i$ , and assume that there are  $N$  sectors. Using the linear

feature of log-ratios, the average productivity across all sectors is then given by the formula:

$$\frac{1}{N} \sum_{i=1}^N \ln \left( \frac{G_i}{L_i} \right),$$

where the ratio  $G_i/L_i$  is the productivity per worker. Let  $D_i$  be the deviation of the productivity per worker of sector  $i$  from the average level across all sectors. It is given by the difference

$$D_i = \ln \left( \frac{G_i}{L_i} \right) - \frac{1}{N} \sum_{j=1}^N \ln \left( \frac{G_j}{L_j} \right).$$

The structural disarticulation index is then given by

$$D = \sum_{i=1}^N |D_i| = \sum_{i=1}^N \left| \ln \left( \frac{G_i}{L_i} \right) - \frac{1}{N} \sum_{j=1}^N \ln \left( \frac{G_j}{L_j} \right) \right|.$$

An important feature of this measure is its insensitivity to size and overall average level of development in the given economy. Thus, it is an index reflecting the structure of the economy, rather than the level of development.

Data for this measure were collected for all less developed countries.<sup>2</sup> Due to missing values on various variables, an index of structural disarticulation was constructed based on data in 1978 since the largest number of cases were retained for this year. Appendix A lists structural disarticulation scores for the 69 countries used in this analysis.

## Data and Other Measures

### *Dependent Variable: Human Development Index*

The lack of research on the potential relationship between structural disarticulation and human development is partly because of the paucity of adequate measurements. This is true for human development. Although many efforts had been made to construct several good measures of social development such as Morris' Physical Quality of Life Index (PQLI), and Estes' Index of Net Social Progress, quantitative researchers were still short of an index which embraced a broader spectrum of both economic and social development. The publication of the *United Nation Human Development Report 1990* has filled this void by constructing a composite index of human development (i.e., HDI). The human development index of 1987 is used as the dependent variable in this research. The measure of human development focuses on three essential elements of human life: longevity (approximated by life expectancy), knowledge (approximated by literacy), and living standard (approximated by the "log" of real GDP per capita based on purchasing power parities). Human development indices are calculated for 130 countries. According to the UNDP (1990) classification, there are 44 countries with a low HDI (from Niger 0.11 to Morocco 0.49), 40

countries with medium human development (Egypt 0.50 to Albania 0.79), and 46 countries with high human development (Malaysia 0.80 to Japan 0.996). Rankings of countries based on HDI demonstrate that economic development indicated by per capita income does not always capture the levels of human progress. The lack of consistency between economic and human development is especially obvious in the developing countries. Because of this, the human development index is chosen as the measure of overall levels of development in a developing country.

### *Independent Variables*

In addition to structural disarticulation, there are several other independent variables in this analysis: trade dependency, foreign investment penetration, external indebtedness, state size and state strength. Previous cross-national studies have shown that these variables exhibit significant impact on economic growth and physical quality of life (e.g., Timberlake and Kentor, 1983; Bornschier and Chase-Dunn, 1985; Bradshaw and Tshandu, 1990; Bradshaw and Huang, 1991; Firebaugh, 1992). Given their significant impact found in previous research, it is important to test whether they have the same impact on human development. Such a test will reveal the validity of the arguments spawned by the modernization theory, the dependency/world-system theory, and dependent development perspective. More importantly, controlling these variables provides a strong and vigorous test of the major hypothesis in this study. It suggests that given the effects of those important economic and social factors, structural disarticulation can still account for much of the variations in Third World human development.

### *Trade Dependency*

Following previous research (e.g., Delacroix and Ragin, 1981; Bradshaw, 1985), trade dependency is measured as primary product export and commodity concentration. Primary product export is created as the percentage of exports classified in SITC (Standard International Trade Classification) categories 0 to 4 circa. Commodity concentration is measured as the percentage contribution of the top three export commodities to total merchandise exports. Both variables are measured in 1975 to allow a ten-year time span from the dependent variables, the human development index 1987.

### *Investment Dependency*

The present analysis favors the measure of investment dependency as a country's total stock of foreign investment divided by its GDP. This measure is widely used because of its simplicity (e.g., Bornschier and Chase-Dunn, 1985; London and Williams, 1988; Wimberley, 1990; Bradshaw and Huang, 1991; Bradshaw et al., 1993).<sup>3</sup> The measure of foreign investment is measured in 1978 and is logarithmically transformed to correct for a skewed distribution.



### *Debt Dependency*

Previous studies have used total debt service as a percentage of GDP, GNP, and exports to measure debt dependency (e.g., Walton and Ragin, 1990; Jenkins and Kposowa, 1990; Bradshaw and Huang, 1991). The present analysis uses several measures of debt dependency, aiming at differentiating the effects of various types of debts. They are (1) multilateral debt as a percentage of GDP; (2) bilateral debt as a percentage of GDP; (3) private debt as a percentage of GDP; and (4) multilateral and bilateral debt as a percentage of GDP. All of these variables are measured for the year 1975. I argue that debt from different sources may have different impacts on human development. Measures of total amount of debt may conceal such differentiating effects.

### *State Size and State Strength*

The diverse development patterns in the developing world have spurred the debate on the role of the state. Dependency theorists contend that the role of Third World states is to increase access to domestic resources for metropole capital by mobilizing public funds for infrastructure investment, and to reform the social and economic structure so that increased labor is available to produce exportable goods (Frank, 1979; Amin, 1980). Meanwhile, the liberal economic theorists hold that the state role should be restricted to building infrastructure and protecting private properties for the local industrialists. However, the dependent development perspective spear-headed by Evans (1979, 1989) suggests that a triple alliance between the state, foreign capital, and local industrialists can bring about economic progress in the developing countries. The burgeoning developmental state argument also argues that development requires a strong state in development orchestration (Bardhan, 1989). Research has shown that states in the East Asian NICs have successfully pursued systematic economic management, selective import liberalization, and exchange rates and tax reform (Amsden, 1985; Haggard, 1986; Gold, 1986; Evans, 1987; Deyo, 1989; Gereffi, 1989).

This research argues that the developmental state has the capacity to design policies conducive to the improvement of human conditions, and the resources to reform the distorted economic structure into an integrated, more balanced, and more productive one. Since it is currently not feasible to measure state policies across nations, I choose to use state size and state strength as proxies for the developmental state. Following Delacroix and Ragin (1981), I measure state size as total government revenue as a percentage of GDP 1975, and state strength as direct taxation/total current government revenue 1975.

### *Control Variables*

Other factors which may also influence human development should be controlled in the models. These important controls are economic growth 1975-1985 and fertility rate 1975. Data for these variables are drawn from the World Bank (1983).

Both variables are included in the human development models mainly as measures of previous development status. Economic growth is used since consensus suggests that it is closely related to human development, albeit not automatically. Fertility rate is controlled to capture the population effect on human development. The population and development issue is one of the most challenging problems in today's global economy, as reflected in the main theme of the 1994 United Nations Population and Development Conference in Cairo, Egypt. Due to the relative high correlation among the three control variables, the present analysis separates them and controls each at a time to avoid the problem of multicollinearity.

This research uses regression analysis to examine determinants of human development. A rigid panel design is not used here; instead, several control variables are used as measures of previous development conditions, which serve the same purpose as in the panel design. In the regression analysis, the presence of outliers and influential cases is constantly checked through examining standardized residuals, hat matrix, and DFIT values (Belsley et al., 1980; Bollen and Jackman, 1990). Furthermore, variance inflation factors and beta correlations are evaluated to detect potential problems of multicollinearity. Although regression diagnostics have detected a few outliers, removing them did not change the substantive findings of this study. This result is consistent with Bollen and Jackman's (1990) argument that outliers are not necessarily influential cases.

## **Analysis and Results**

Table 1 presents regression models of human development controlling for economic growth. In the first equation, economic growth as expected shows a positive effect on human development. The second equation confirms the main hypothesis of this research. Structural disarticulation demonstrates a strong negative effect on human development. What is more striking is that the R-square has doubled in the second equation from .155 to .303. Looking at the standardized regression coefficients in Table 1, structural disarticulation has almost equal (slightly bigger) regression coefficients with that of economic growth, which indicates the impact of structural disarticulation is as important as that of economic growth on Third World human development. The rest of the equations in Table 1 test whether structural disarticulation can sustain its high level of significance after adding other independent variables.

To take into account one major "internal" determinant of human development, equation 3 in Table 1 examines the impact of state size, retaining economic growth and structural disarticulation. Results indicate that state size, measured by government revenue/GDP, has a significant positive effect on human development. This finding strongly supports the notion that the developmental state is a crucial factor that explains either the success or failures of Third World development (Bates, 1981; Stepan, 1985). In addition to the expected positive effect of economic growth, structural disarticulation con-

Table 1  
 Linear Regression of Human Development on Economic Growth, Structural Disarticulation, Economic Dependency, and State Size: Unstandardized Coefficients (Top Numbers) and Standardized Coefficients<sup>a</sup>

Independent Variables	Dependent Variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Economic Growth 1975-85	79.944*** (.404)	75.716*** (.388)	72.221*** (.380)	55.134*** (.290)	50.508*** (.266)	54.962*** (.290)	46.999** (.251)	46.447*** (.248)
Structural Disarticulation 1978	-	-38.407*** (-.396)	-32.114*** (-.332)	-27.003*** (-.279)	-30.882*** (-.318)	-33.362*** (-.342)	-31.806*** (-.313)	-30.505*** (-.300)
State Size 1975	-	-	6.017** (.208)	6.903** (.238)	3.860 (.121)	5.953** (.206)	4.611 (.142)	4.777 (.147)
Commodity Concentration 1975	-	-	-	-2.761*** (-.315)	-	-2.705*** (-.304)	-2.897*** (-.308)	-2.923*** (-.311)
Primary Product Export 1975	-	-	-	-	-2.174** (-.261)	-	-	-
Foreign Investment 1975	-	-	-	-	-	-25.293 (-1.120)	-7.697 (-.035)	-
Multilateral and Bilateral Debt/GDP 1975	-	-	-	-	-	-	-29.640* (-.200)	-30.273* (-.205)
Constant	578.597***	731.259***	596.336***	715.635***	780.939***	670.002***	796.229***	815.701***
Adjusted R-square	.155	.303	.313	.400	.350	.451	.451	.460
N	69	69	67	67	64	65	61	61

<sup>a</sup> As noted in the variable description, foreign investment is logarithmically transformed throughout the analysis. Standardized coefficients are in parentheses.

\*  $p < .10$  (two-tailed test) \*\*  $p < .05$  (two-tailed test) \*\*\*  $p < .025$  (two-tailed test)

tinues to have a strong negative impact on human development. Its standardized coefficients and t-value indicate a high level of statistical significance, reflecting the strength of its impact.

Equations 4 through 8 evaluate various types of dependency—trade, investment, and debt—on human development, controlling for economic growth, structural disarticulation, and state size. Trade dependency, indicated by commodity concentration and primary products exports, first reveals their negative effects in equations 4 and 5, respectively. In both equations, economic growth and structural disarticulation show significant effects on human development, while state size retains its significance in equation 4 but loses it when primary product export is entered into equation 5. Dropping primary product exports, the last three equations in Table 1 test the impact of foreign investment and debt dependency. In equation 6 and 7, foreign investment dependency fails to show a significant impact on human development. The equations' other variables maintain their basic levels of significance. However, debt dependency, indicated by multilateral and bilateral debt/GDP, demonstrates a strong negative effect on human development in equations 7 and 8. The significant impact of debt suggests that the global debt crisis has posed a severe constraint on human development in the Third World. The scenario depicted in the last three equations of Table 1 illustrates that the changing structure of the world capitalist system has made external debt the primary form of dependency, crippling economies and societies in the poor countries. The phenomenon of the global debt crisis has immense theoretical value, as Bradshaw et al. (1993:631) clearly point out, "...since the mid-1970s, the most important mechanism of international economic dependency may emanate from Third World indebtedness, not from foreign investment and other 'traditional' forms of dependency."

The final analyses presented in Table 2 considers an alternative control variable—the fertility rate. The recent United Nations Population and Development Conference has heightened the world's attention on the runaway population growth rate in the Third World countries. Delegates from different parts of the world have forcefully argued that rampant population explosion seriously hampers economic development and the improvement of social well-being in today's Third World countries. The first equation in Table 2 substantiates that conviction, showing a strong negative effect of fertility rate on human development. With this finding, it can be argued that population control should relieve some of the pressure of food production, allowing more resources to be designated to uplifting the living standards of the Third World population.

Given the strong population impact on human development, will the effect of structural disarticulation be overshadowed by fertility rate? This possibility is examined in the rest of the equations in Table 2. Despite the strong showing of fertility rate, structural disarticulation demonstrates consistently a significant negative effect on human development in all models of Table 2. Table 2 also tests the impact of state strength, measured by direct taxation/total government revenue, and trade dependency, measured by primary product exports.

Table 2  
*Linear Regression of Human Development on Fertility Rate, Structural Disarticulation, Economic Dependency, and State Strength: Unstandardized Coefficients (Top Numbers) and Standardized Coefficients<sup>a</sup>*

Independent Variables	Dependent Variables						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	<i>Human Development Index 1987</i>						
Fertility Rate 1975	-114.252*** (-.725)	-100.280*** (-.636)	-92.102*** (-.584)	-91.304*** (-.579)	-89.483*** (-.579)	-92.078*** (-.567)	-91.519*** (-.563)
Structural Disarticulation 1978	-	-27.849*** (-.287)	-26.676*** (-.275)	-29.717*** (-.307)	-24.985*** (-.258)	-21.568*** (-.227)	-22.108*** (-.233)
State Strength 1975	-	-	2.742** (.184)	2.854** (.192)	.355 (.021)	.220 (.013)	.241 (.015)
Foreign Investment 1975	-	-	-	-20.024 (-.094)	-	-	-
Primary Products Export 1975	-	-	-	-	-1.707** (-.203)	-1.511* (-.178)	-1.458* (-.172)
Commodity Concentration 1975	-	-	-	-	-	-	-
Private Debt/GDP 1975	-	-	-	-	16.849 (.092)	-	-
Bilateral Debt/GDP 1975	-	-	-	-	-	-28.168* (-.169)	-
Multilateral and Bilateral Debt/GDP 1975	-	-	-	-	-	-	-23.483* (-.157)
Constant	1251.339***	1279.078***	1139.926***	1075.128***	1285.077***	1324.410***	1322.667***
Adjusted R-square	.517	.586	.611	.612	.643	.638	.633
N	60	60	60	60	58	56	56

<sup>a</sup> As noted in the variable description, foreign investment is logarithmically transformed throughout the analysis. Standardized coefficients are in parentheses.

\* p < .10 (two-tailed test) \*\* p < .05 (two-tailed test) \*\*\* p < .025 (two-tailed test)

Equation 3 shows that state strength has a significant positive impact on human development while fertility rate and structural disarticulation are controlled. Again, foreign investment dependency fails to achieve statistical significance while controlling for fertility rate, structural disarticulation, and state strength. The same is true for private debt/GDP.

Finally, the last two equations in Table 2 investigate the effects of bilateral debt alone and official debt while controlling for fertility rate, structural disarticulation, state strength, and primary product exports. Bilateral debt/GDP exhibits a significant negative effect on human development no matter what control variables are used. Multilateral and bilateral debt/GDP also has a significant negative effect on human development. While state strength is not significant in the last three equations, fertility rate, structural disarticulation, and primary product exports retain their significance.

To summarize, structural disarticulation has become a powerful factor that accounts for Third World human development. As population size increases, poverty persists, the unequal distribution of wealth prevails, and the world's competition for resources—especially food—intensifies, a relatively balanced approach toward development has become all the more important. Meanwhile, classical trade dependency proves to be harmful to Third World human development, although the roles of foreign investment and private debt appear to be more intricate. Further investigation of their impact on human development moves beyond the scope of the current research. Despite this, official debt, coming from multilateral and bilateral sources, may constitute a big stumbling block on the road to achieving sustainable human development in the Third World. While the global debt crisis has virtually halted the new flow of financial resources, the international creditors continue to pressure the indebted countries for payments. Under such pressure, Third World governments will have little resources to invest in education, health care, and other social programs.

## **Discussion**

This article has made new substantive and theoretical contributions to the study of Third World development. First and foremost, in contrast to most of the cross-national research, I have focused on human development that covers a broad spectrum of social and economic progress. This focus is critical in contemporary Third World societies, where increasingly economic growth has failed to trickle down to the mass population, creating an extremely unequal income distribution. For instance, some of the Latin American countries, which have experienced the world's fastest economic growth, hold the world's greatest income inequality. The global debt crisis also highlights this point. In light of mounting pressures for debt payment, the debt-ridden countries are prone to cut spending in education, general health care, child immunization, and other vital social programs, all of which directly affect the livelihood of ordinary people in the Third World. Overall, my analysis suggests that the United Nation's World Summit on Human Development to be held this year has a

tough battle ahead. Investing in people is likely to be caught between the need for balancing sectoral development and the pressures of debt-servicing from international financial institutions.

This article has identified structural disarticulation as a major problem hampering Third World economic and social progress. To systematically study the problem of structural disarticulation, I have first clarified the theoretical meaning of this concept drawing on the insights of both development economics and dependency theories. Such efforts result in a measurement of structural disarticulation, which is substantively meaningful and mathematically robust. Furthermore, the effect of structural disarticulation has been subject to systematic and rigorous empirical testing. Through multiple tests, I have shown that structural disarticulation exerts a strong negative effect on human development net of (1) the level of development and (2) other well-known economic and social factors such as trade dependency, foreign investment penetration, external indebtedness, state size, and state strength. This new finding should enrich theories and empirical study of Third World human development.

Results of this study imply that to come to grips with the complexity of the rapidly changing Third World development process, scholars need to constantly search for new forces that explain such complexity. One crucial area for these forces may be *structural* in essence. Along this line, the emphasis on structural disarticulation has proven to be beneficial. I have found that as a structural problem, disarticulation is often deep-seated in Third World economies and societies. Such a problem thus deserves more attention from the research community, and requires further investigation. Moreover, as a structural issue, it is often related to many other more obvious and familiar problems, such as overurbanization, unemployment, rural poverty of women and children, and the more dramatic international refugee movement from the South to the North. By discovering more structural problems, we will be able to get closer to the roots of many contemporary development issues.

To advance our understanding of structural disarticulation, naturally, we want to understand its causes. It is expected that various schools of thought postulate drastically different propositions on this problem. From a dependency perspective, Amin argues that dependency creates structural disarticulation, for instance, by forcing down industrial wages in the peripheral states and by instigating production patterns suitable only for development in industrial countries. Conversely, modernization theorists will look at internal factors such as the population pressure, low levels of technology, and inefficient social and economic organizations for their account of the story. An analysis on the origin of structural disarticulation will surely invite another round of fierce debate among interested scholars. Future research should investigate this important problem since it will contribute greatly to the refinement of existing theories.

**Appendix A:** Index of Structural Disarticulation, 1978, N = 69

Country	Disarticulation	Country	Disarticulation
Algeria	19.2	Mali	99.9
Argentina	10.7	Mauritius	15.8
Bangladesh	32.3	Mexico	23.7
Benin	67.5	Morocco	11.9
Bolivia	19.9	Mozambique	51.9
Botswana	23.5	Nepal	74.8
Brazil	13.9	Nicaragua	23.3
Burma	11.5	Niger	32.9
Burundi	9.1	Nigeria	26.8
Cameroon	12.3	Pakistan	60.4
Chili	10.3	Panama	14.0
Colombia	30.7	Papua New Guinea	10.7
Costa Rica	4.2	Paraguay	10.9
Côte d'Ivoire	6.9	Peru	18.0
Ecuador	27.1	Philippines	22.3
Egypt	10.6	Portugal	10.8
El Salvador	3.9	Rep. of Korea	9.2
Gabon	31.8	Senegal	26.3
Ghana	40.6	Sierra Leone	35.7
Guatemala	25.9	Singapore	8.5
Guinea	35.8	Sri Lanka	21.0
Haiti	43.3	Sudan	29.7
Honduras	22.4	Syria	15.7
Hong Kong	7.1	Tanzania	29.5
India	35.9	Thailand	43.0
Indonesia	26.4	Togo	37.7
Israel	1.3	Trinidad & Tobago	21.9
Jamaica	26.9	Tunisia	10.6
Kenya	5.4	Turkey	49.6
Lesotho	47.8	Uganda	73.9
Liberia	20.2	Uruguay	16.3
Libya	41.1	Venezuela	15.5
Madagascar	14.6	Zambia	8.8
Malawi	3.2	Zimbabwe	18.0
Malaysia	47.3		

**Appendix B:** Data Source

Variable	Source
Human Development Index, 1987	UNDP (1990)
Structural Disarticulation Index 1978	ILO (1987)
GDP per capita, 1975	World Bank (1983)
GDP per capita, 1985	World Bank (1989)
Fertility Rate, 1975	World Bank (1989)
Government Revenue/GDP, 1975	Taylor and Jodice (1983)
Direct Taxation/total government revenue, 1975	IMF (1986)
Primary Product Export, 1975	IMF (1986)
Commodity Concentration, 1975	UNCTAD (1986)
Foreign Direct Investment, 1978	World Bank (1984)
Multilateral Debt, 1975	United Nations (1983)
Bilateral Debt, 1975	World Bank (1986)
Private Debt, 1975	World Bank (1986)
	World Bank (1986)



## NOTES

- 1 The Human Development Index (HDI) scores for Sri Lanka and Brazil are .784 and .789, respectively, which represent high levels of human development. HDI scores range between .11 and .99 for 130 countries listed by the UNDP (1990).
- 2 The information on productivity by sector was obtained from World Bank reports (World Tables 1983). Gross domestic product is reported for nine sectors: (1) agriculture, (2) mining (including petroleum and natural gas production), (3) manufacturing, (4) construction, (5) utilities (electricity, gas, and water), (6) transportation and communication, (7) trade and finance, (8) public administration and defense, and (9) "other". To match categories of labor force distribution, categories 6, 7, and 8 were collapsed into a single "service" category. Data for the 1978 labor force distribution were drawn from the Yearbook of International Labor Studies (1987) supplemented by other volumes.
- 3 Early analyses (not shown here) indicated that there is no significant difference between this measure and the PEN measure created by Bornschier and Chase-Dunn (1985). Moreover, the PEN measure was only available for the year 1967. This does not meet the needs of this research, since I try to measure all the independent variables around the mid-1970s.

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