ENVIRONMENTAL DEGRADATION, ENVIRONMENTAL SUSTAINABILITY, AND OVERURBANIZATION IN THE DEVELOPING WORLD: A QUANTITATIVE, CROSS-NATIONAL ANALYSIS

JOHN M. SHANDRA*  
Boston College

BRUCE LONDON  
Clark University

JOHN B. WILLIAMSON  
Boston College

ABSTRACT: This is the first quantitative, cross-national study that incorporates predictors designed to test hypotheses linking overurbanization to environmentally induced migration. The study is based on a sample of fifty-eight developing countries using lagged dependent variable panel regression. Our major findings are quite clear with respect to newer rural-push and urban-pull arguments: that developing countries suffering from various forms of environmental degradation are prone to overurbanization. Deforestation exerts a positive and significant effect on overurbanization, whereas environmental sustainability exerts a negative and significant effect on overurbanization. In addition, our results support hypotheses derived from the political modernization perspective: that civil society and democratic regimes help to reduce overurbanization, as well as hypotheses suggested by neo-Malthusian theory that high levels of population growth contribute to high levels of overurbanization. We also find support for dependency theory in that transnational economic linkages based on multinational corporations and international lending institutions foster increased overurbanization in the developing world.

The current study represents an effort to extend previous research on the demographic, economic, political, and social determinants of cross-national variation in overurbanization. Over the past two decades, a number of quantitative, cross-national studies have examined the factors that shape overurbanization in the...
developing world (Bradshaw 1985, 1987; Bradshaw and Schafer 2000; Firebaugh 1979; Kasarda and Crenshaw 1991; Kentor 1981; London 1987; Smith 1987; Timberlake 1987; Timberlake and Kentor 1983). Almost simultaneously, there has been an increase in attention by both researchers and policy makers to environmental degradation as a cause of overurbanization from rural to urban migration (Broad and Cavanagh 1993; Camp 1993; Field 1992; Homer-Dixon 1991, 1994; Jacobson 1989; Myers 1993, 1997; Suhrke 1994). However, no studies in the cross-national genre have attempted to incorporate predictors designed to test hypotheses linking overurbanization to environmentally induced migration.

We address this gap in the literature by elaborating a carefully constructed model of the characteristics of nations that influence overurbanization throughout the developing world. First, we review five of the most frequently used theoretical frameworks in the development literature. Second, we review a number of quantitative, cross-national studies of overurbanization to identify various demographic, economic, political, and social factors that have been found to affect this development process. We then construct our quantitative, cross-national models in which we test a number of hypotheses suggested by the environmental literature and by the relevant development literature.

OVERURBANIZATION IN THEORETICAL PERSPECTIVE

Over the past half century, theorists have attempted to describe the forces that drive development in the Third World. For ease of presentation, we group the most commonly mentioned explanations into five main schools of thought: the rural-push and urban-pull perspective, the economic modernization perspective, the political modernization perspective, the neo-Malthusian perspective, and the dependency perspective. Traditional rural-push and urban-pull theory stresses the role of population pressure and agricultural productivity in rural areas in urbanward migration. Economic modernization theory stresses the importance of internal economic characteristics in the development process of a Third World country. Political modernization theory considers the role regime ideology and civil society plays in influencing development processes. Neo-Malthusian theory suggests that population growth is responsible for overurbanization in the developing world. Finally, dependency theorists focus on the impact of external or international factors, including a variety of transnational economic linkages associated with exports, multinational corporations, and international lending institutions.

The Rural-Push and Urban-Pull Perspective

Historically, demographic explanations have dominated the sociological literature on rural-urban migration in countries of the developing world (Harper 1998; Hawley 1971; Weeks 1996). Most work in this tradition emphasizes the notion that increasing numbers of people are available for redistribution. As the demographic transition occurs, reductions in the crude birthrate of a developing country yield precipitous population growth in rural areas (Hawley 1971). Population growth often outstrips job opportunity, and overall agricultural productivity decreases
and results in a labor surplus in that sector. Detrimental effects follow for developing nations. Without jobs and income, a rural country’s population becomes increasingly impoverished and urbanward migration occurs as a response to both rural population pressure and the perception of more favorable economic opportunities in the city (Hawley 1971). Thus overurbanization occurs. Several studies have incorporated and found support for hypotheses suggested by this aspect of rural-push and urban-pull theory (Bradshaw 1987; Firebaugh 1979; Kasarda and Crenshaw 1991; London 1987).

A number of scholars have expanded traditional rural-push and urban-pull explanations of migration to include environmental factors (Broad and Cavanagh 1993; Camp 1993; Homer-Dixon 1991, 1994; Jacobson 1989; Myers 1994, 1997). Central to this expansion of the theory is the concept of environmental scarcity, which consists of three dimensions: supply-induced, demand-induced, and structural (Broad and Cavanagh 1993; Camp 1993; Homer-Dixon 1991, 1994). Supply-induced scarcity occurs when resources are reduced and degraded faster than they are renewed. Demand-induced scarcity is caused by increased consumption per capita. And structural scarcity is the consequence of inequitable distribution of resources in the hands of a few people while the remaining population suffers from resource shortages (Homer-Dixon 1994).

Increased environmental scarcity caused by one or more of these factors is assumed to have several consequences, which in turn may foster migration from rural to urban areas. Environmental scarcity may produce (1) income effects (i.e., decreasing the current earnings of workers in rural areas by reducing agricultural production), (2) risk effects (i.e., increasing the instability of rural workers’ future earnings by reducing agricultural production), and (3) health effects (i.e., decreasing the health of populations in rural areas) (Broad and Cavanagh 1993). With diminished incomes from declines in agricultural productivity, with the potential for diminished incomes resulting from declines in agricultural productivity, or with decreases in health outcomes, a rural country’s population becomes increasingly impoverished and urbanward migration occurs as a response to the perception of more favorable economic opportunities in the city (Camp 1993; Homer-Dixon 1994).

For an illustration on how environmental degradation fosters rural to urban migration, consider the following anecdotal evidence. Agreements reached in the late 1980s among the Hun Sen government of Cambodia, the Thai military, and private timber corporations have led to uncontrolled pillaging of Cambodia’s forests (Hong 2001). Mass deforestation has in turn led to disastrous flooding, siltation, and fish die-offs. Hong (2001:330) maintains, “The biggest threat is to Cambodia’s Tonle Sap (Great Lake), described as one of the richest freshwater fishing grounds in the world, which is silting up as a result of deforestation and could disappear within the next two decades.” Large-scale deforestation and the associated ecological devastation have increased the occurrence of drought and flooding as well as erosion, so that soil fills channels carrying fresh water. Although the exploitation of the forests in Cambodia often has been the result of violent political conflict, this environmental degradation could soon make sections of the country uninhabitable, thereby precipitating increased rural to urban migration, as the
livelihoods of communities that depend on the forests and the lake for food, shelter, and water resources are destroyed (Hong 2001).

Additional anecdotal evidence comes from the Philippines. In the rural provinces of this country, most people depend directly on forests for their livelihoods. Deforestation is making large numbers of Filipinos even poorer and forcing them to migrate to Manila, adding to its already sprawling population (Broad and Cavanagh 1993). Broad and Cavanagh describe this process in the following way:

To witness this “push” factor for ourselves, we leave Manila’s pollution and crowds behind and travel to the countryside. There we see that Manila’s pollution represents but a small part of the Philippine environmental crisis. There we begin to catch a glimpse of a fundamental difference between the environmental problems of Manila and those in the countryside. As we venture outside Manila, we discover that most environmental problems involve the depletion and degradation of natural resources at the start of the production chain. Forests and fishing grounds for most Filipinos are sources of livelihoods. Countries like the Philippines are generally primary producers, with large subsistence sectors totally dependent upon natural resources. To live, people eat and sell the fish they catch or crops they grow—and typically, these people exist at the margin. For them, natural resource degradation becomes an immediate and life- and livelihood-threatening crisis. (1993:25–24)

Rural to urban migration precipitated by environmental degradation is not unique to Asia. Field writes:

In Brazil, people fleeing the drought ridden Sertão area in the northeast are legion and legend. Not surprisingly, much of their movement is hidden from the headlines. It is an internal migration that has been going on for decades. One famous saying sums up this movement: “In Sertão, one stays and dies or leaves and suffers.” (1992:37)

In this Brazilian province, each prolonged period of drought forces a few hundred thousand more people off the land. Deforestation was and remains high as forests were first cleared for coffee, then cotton, and today manioc. Field (1992:38) continues, “As the soil becomes increasingly infertile, people move to the growing coastal cities. Small landholders move when their subsistence yields drop as their families grow. Other people are forced to move when large landowners worry about declining productivity and expel residents to make way for cattle.”

Deforestation facilitating urbanward migration is also prevalent in Haiti. On discovery by Europeans, Haiti was densely forested. During its colonization by the French, it became known for its mahoganies and other hardwoods. After achieving independence in 1804, Haitians broke up large plantations and established a thriving peasant economy. Over the next two centuries, farmers cut forests for fuel and to make space for a growing population. Between the farmers and timber merchants, Haiti’s forests disappeared (Field 1992). Today, Haitians struggle just to feed themselves, as mass soil erosion from deforestation has rendered the land unsuitable for agriculture. When that struggle or the threat to life is too great, rural residents push into urban slums or “flee their country because of political problems exacerbated by a ravaged environment” (Field 1992:38).
Although this anecdotal evidence is not representative of the entire developing world, it suggests an important hypothesis that we undertake to test.

The Economic Modernization Perspective

Arising from neoclassical economic contentions that scarce goods are efficiently distributed through markets, economic modernization theory emphasizes internal or intranational financial factors in its analysis of development processes (Rostow 1990). Economic modernization theory views development as bridging the gap between developed and underdeveloped nations through an imitative process. Economic growth is the driving force behind development in the Third World. Increased economic development fosters greater levels of industrialization, technological innovation, and infrastructure expansion (Rostow 1990). Migration is often negatively associated with improvements in interregional transportation systems that accompany economic growth. Specifically, air, rail, road, and other communication networks tend to discourage out-migration by increasing the area in which an individual may seek employment without changing his or her residency (Hawley 1971). Several cross-national studies have modeled and found support for the negative relationship between level of development and overurbanization (Bradshaw 1987; Bradshaw and Schaefer 2000; Firebaugh 1979; Kasarda and Crenshaw 1991; London 1987).

The Political Modernization Perspective

No examination of the modernization perspective is complete without considerations of noneconomic dimensions such as political factors (Bollen 1983; Bradshaw and Schaefer 2000; Schaefer 2000). Over the past two decades, an active civil society taking the form of international nongovernmental organizations (INGOs) has emerged and begun to express the development interests of local peoples worldwide in an attempt to balance the economic interests of multinational corporations and international lending institutions (Fischer 1999; Rich 1994). The rise of INGOs as influential partners in development issues has been well documented (Bradshaw and Schaefer 2000; Ndegwa 1996; Rich 1994; Schaefer 1999). The question we wish to address is, how do INGOs help to lessen overurbanization in developing countries?

High levels of environmental degradation may produce income effects, risk effects, and health effects in rural areas (Broad and Cavanagh 1993). As discussed above, these effects create increasing poverty and declining health outcomes among rural populations in a developing country. Therefore, urbanward migration occurs as a response to more favorable opportunities in the city (Camp 1993).

However, INGOs often provide services to reduce income, risk, and health effects in rural areas. They address such problems in rural areas by (1) funding environmental programs (e.g., sustainable agriculture techniques) that protect natural resource reserves (Bradshaw and Schaefer 2000; Ndegwa 1996; Schaefer 1999); (2) funding programs that provide medical and other basic social services to rural populations (Fischer 1999; Ndegwa 1996); (3) stimulating grassroots community
support to protect local ecosystems and resources (Ghils 1992; Ndegwa 1996; Schafer 1999); (4) facilitating state-society partnerships for the protection of natural resource reserves (Barkan, McNulty, and Ayeni 1991; Bradshaw and Schafer 2000; Schafer 1999); (5) facilitating state-society partnerships for the provision of health and other basic social service programs; and (6) propagating worldwide standards pertaining to the importance of environmental protection (Boli and Thomas 1997; Bradshaw and Schafer 2000; Schafer 1999). Given the provision of such services by international nongovernmental organizations, there should be reduced environmental degradation and elimination of the accompanying economic and health effects that often precipitate rural to urban migration.

Social theorists have commented on the multidimensionality of civil society (Fischer 1999; Karlmer 1997; Rich 1994). They suggest that civil society not only takes the form of NGOs but also of local grassroots movements. The latter are often composed of domestic populations that mobilize and challenge a regime’s ascendency through various types of political protests and demonstrations. In doing so, they pressure states of the developing world to provide more funding for programs that protect natural resource bases as well as increased access to health and other basic social services in rural areas. Consequently, these protests often result in a reduction of environmental degradation and eliminate the effects that may hasten rural to urban migration.

The Chipko movement in India illustrates this point. The Chipko movement started in 1973 with spontaneous interventions by women in Himalayan villages to protect local forests from logging contractors, who had been granted permits by state forestry agencies. Rich describes these events:

The women literally encircled trees with their bodies, embracing them in an ultimate gesture of protection and care—thus "Chipko," which comes from the Hindi verb meaning "to hug." The Chipko protests spread throughout the Himalayas and to forested hill regions in the South of India such as the Western Ghats. As a result, India’s Prime Minister Indira Gandhi in 1981 declared a fifteen-year ban on tree felling in the Garawahl Himalayas, the region where the Chipko protests originated. Yet the movement continued to spread; Gandhian activist Sunderlal Bahuguna led a 5,000-kilometer march from Kashmir to Bhutan to spread the Chipko message between 1981 and 1983. In Bahuguna’s words, "Economy is permanent ecology." As such, the tree-felling ban was extended to include all land from Kashmir to Bhutan, thereby protecting a vast expanse of land once subject to uncontrolled tree felling. (1994:285)

The protests eliminated the causes (i.e., income, risk, and health effects) that facilitate rural to urban migration by protecting a natural resource base on which rural residents in India depended for their existence.

The Chipko movement is among the best-known cases of local forest people organizing freely and democratically to protect resources held in common and prevent migration elsewhere to secure a living, yet there are many others. In the pine forests of Honduras more than six thousand families depend on resin tapping for survival. In the 1970s these villagers launched logging blockades and organized cooperatives to obtain forestry concessions for extractive resin harvesting
to conserve the pine trees on which their livelihood depends, thereby eliminating
the need to migrate to urban areas to ensure their existence (Rich 1994). Rich
states:

Today, the villagers physically patrol the forest and limit access to loggers and
agricultural encroachers; on two occasions they went and met with the head of
the national forestry agency to demand that outside logging and encroachment
be halted. Presently, the resin tapers control 1,000 square kilometers of pine
forest in which extractive ventures involving the destruction of the natural for-
est is prohibited by the government of Honduras. (1994:286)

Similarly, in 1980, in the heavily forested Sierra de Juarez of southern Mexico,
thirteen communities formed the Organization for the Defense of the Natural
Resources and Social Development of the Sierra Juarez (Rich 1994) to fight the
Mexican government’s decision to renew a logging concession to a private, multi-
national timber corporation. The group began its protests by publishing its own
newspaper. The first edition declared. “We will no longer permit our natural
resources to be wasted, since they are the patrimony of our children. The forest
resources should be in the hands of our communities” (cited in Rich 1994:286). In
1981 the group organized the first national meeting of forest communities in the
country and staged several rallies in Mexico City as well as provincial capitals.
After a hostile court battle, the communities won a major legal precedent in 1982
granting them the right to communally operate a majority of the forested land in
this region of Mexico, thereby protecting the resources on which their livelihood
depends and eliminating the factors underlying migration from rural to urban
areas (Rich 1994).

All of these case studies illustrate how political protests can be linked to
decreased overurbanization by reducing rural to urban migration through the
preservation of natural resources such as forests.

Given the expected negative relationship between civil society and overurban-
ization, the level of political democracy should influence the level of overurbaniza-
tion in noncore countries as well. In particular, some scholars suggest that demo-
cracies in the Third World are more likely to be responsive to public opinion, social
movements, and special interest groups concerned with development issues such
as overurbanization, whereas nondemocracies tend to respond to transnational
corporate interests not associated with such concerns (Crenshaw and Jenkins
1996; Evans 1979; Karlner 1997; London and Ross 1995; Rich 1994; Ross and Trachte
1990). Put differently, democracies should, therefore, be more responsive to the
social concerns of civil society. Conversely, political repressiveness can lead to
an increase in overurbanization, as repressive regimes are less likely to respond
to public opinion, social movements, and interest groups not concerned with
development issues (i.e., multinational corporations and international lending
institutions) (Leonard 1988; London and Ross 1995). In responding to the con-
cerns of civil society, democracies are likely to reduce overurbanization. To our
knowledge, no previous cross-national studies have modeled the relationship
between the level of democracy and an indicator of overurbanization in a devel-
oping country.
The Neo-Malthusian Perspective

According to neo-Malthusian theory, population growth is a major cause of overurbanization throughout the developing world (Bell 1999; Harper 2001). Neo-Malthusian theory suggests that high fertility and population growth lead to an ecological "overshoot" in terms of overcultivation, excessive fertilizer use, deforestation, desertification, and soil erosion—all of which can be linked to lower agricultural productivity, especially in rural areas (Rudel 1989). With the increase in poverty associated with declining agricultural productivity, urbanward migration occurs as a response not only to population pressures, but also to the perception of more favorable economic opportunities in the city (Hawley 1971). Thus overurbanization often increases in a developing country with increases in the population growth rate. Several studies have incorporated and found support for hypotheses suggested by neo-Malthusian theory (e.g., Crenshaw and Oakey 1998; Kasarda and Crenshaw 1991).

The Dependency Perspective

According to dependency theory, the capitalist world system perpetuates a global division of labor that distorts the domestic economy of many developing nations, reduces the rate of economic growth, increases income inequality, and adversely affects well-being for a substantial portion of a population (Frank 1967; Gereffi 1989; Wallerstein 1974). Dependency theorists argue that trade dependence has aggravated the gap between core and peripheral countries because the exchange of raw materials for processed goods is inherently unequal and prices for primary goods have experienced long-term decline relative to prices for processed goods (Frank 1967). As a result, the state's ability to raise revenues is weakened, which affects the funding of many education, health, and social programs, especially in urban areas, allowing for overurbanization to occur.

In the dependency literature, scholars have noted the changing nature of core-periphery relations in the past three or four decades, as the tendency for multinational corporations to invest in industrial production in the periphery has increased (Bornschier and Chase-Dunn 1985; Frank 1967). They suggest that direct foreign investment promotes underdevelopment in developing countries. Specifically, multinational corporations obstruct education, health, and other social programs by hampering government policies that are beneficial to much of the population but harmful to their own interests (Bornschier and Chase-Dunn 1985; Evans 1979; Ross and Trachte 1990). From a dependency perspective, one of the hypothesized consequences is increased overurbanization as multinational corporations move more of their production facilities to the periphery. Some quantitative, cross-national studies have found the hypothesized relationship between multinational corporate penetration and an indicator of overurbanization (Bradshaw 1985; Bradshaw and Schafer 2000; Kentor 1981; London 1987; Smith 1987; Timberlake 1987; Timberlake and Kentor 1983).

Since the 1970s many developing nations have become part of the international debt crisis. Foreign debt expansion and concomitant austerity measures dictated
by institutions that lend developing nations capital (i.e., the World Bank and the International Monetary Fund [IMF]) have added a new dimension to core-peripheral dependency relations (Bell 1999; Bradshaw and Huang 1991; Harper 2001). Debt and interest payments drain already scarce capital from investment in the national economy and, as a result, inhibit economic development. This reduces government spending on various social service programs, especially in urban areas, preventing any potential reduction in levels of overurbanization. To date, a few empirical studies suggest that debt dependency has an adverse effect on an indicator of overurbanization (Bradshaw and Schafer 2000).

METHODOLOGY

Research Design: Panel Regression

We use a panel regression model research design to determine the predictors of overurbanization. In panel regression analysis, the dependent variable at one point in time is regressed on itself at an earlier point in time (the lagged dependent variable) and the other independent variables of interest at that same earlier point in time. This method estimates the effects of the independent variables on change in the dependent variable between two time points.

This is widely regarded as a powerful tool for making causal inferences with nonexperimental data and has several advantages over other multivariate regression models. First, a panel design helps to rule out reciprocal effects and reduces the threat of spuriousness due to an apparent effect that can be accounted for by another variable causally prior to both the dependent and the independent variable of concern. Second, since there is usually a high correlation between the lagged dependent variable and the dependent variable, panel analyses assign maximum explanatory power to the lagged dependent variable. This produces a conservative test of the effect of the independent variables on change in the dependent variables. This makes it appropriate to discuss effects that are significant at the $p < .10$ level as well as the more conventional $p < .05$ level. Third, panel regression improves on unconditional change score models, which assume that the lagged endogenous variable has no effect on later values. This assumption is unrealistic with a phenomenon such as overurbanization that tends to remain stable over time, with small incremental change. Fourth, a lagged panel model is also superior to fixed effects models, or “the method of first difference,” insofar as it allows us to examine independent variables that are long-standing structural conditions as well as trends (Finkel 1995).

There are, however, some problems associated with the use of panel regression. For example, the possibility of serial correlation of errors is introduced. With serial correlation, the result would again be a more conservative test of the main hypotheses because the effect of the lagged dependent variable would be inflated relative to the estimated effects of the independent variables (London 1987; Timberlake and Kentor 1983). Also, Jackman (1980) notes the potential problem of heteroskedasticity in analyses of this sort. He suggests that this potential problem can be reduced by the logarithmic transformation of the dependent and lagged dependent variables (see below).
Our dependent variable is overurbanization for 1997, and the lagged dependent variable is overurbanization for 1980. Data for the independent variables were obtained from about 1975 to 1980. Finding quality data for comparative analysis can be difficult, and it requires some adjustments to ideal models. While it would be preferable to collect all the data for one year, the range represented should not significantly alter the substantive results (Ehrhardt-Martinez 1998). This design is also referred to as the cross-lagged effects model, as shown in the mathematical notation

\[ Y_t = B_0 Y_{t-1} + B_1 + B_2 X_{t-1} + E_t \]

The dependent variable \(Y_t\) is hypothesized to be determined by the lagged dependent variable \(Y_{t-1}\), the constant \(B_1\), the lagged value of the independent variable \(X_{t-1}\), and an error term \(E_t\).

**Countries Included**

The population for this study is defined as all noncore nations according to Bollen's (1983) reclassification of Snyder and Kick's (1979) classification of world system position. As is standard in studies of this sort, countries with any missing information are excluded from the analysis. In the initial set of equations that include all controls, complete data for our models yield a case base of forty-seven to fifty-eight developing countries. To maximize the use of available data, we allow our sample size to vary from one model to another depending on data availability. One should use caution when interpreting differences between models. Various scholars have offered sample size guidelines that concern the appropriate ratio of cases to predictors. For example, Tabachnick and Fidell (2001) suggest that standard multiple regression may be conducted with as few as five cases to every one predictor, whereas Polit (1996) argues that it is necessary to have ten cases for every predictor. When constructing our models, we maintain a ratio of between five and ten cases to every predictor.

**Regression Diagnostics**

In addition to the basic ordinary least squares analysis, we make extensive use of various regression diagnostics such as Cook’s D to test for the presence of influential cases. In cross-national analysis, there is a very real risk that regression results will be highly sensitive to a small number of influential cases (Polit 1996). When our regression diagnostics suggest the presence of highly influential cases, we rerun the analysis deleting those cases. If the basic pattern of results is not dramatically changed, confidence in the validity of the initial equations is enhanced.

If the pattern is substantially changed, we call this to the reader’s attention and present our results excluding these cases.

In any quantitative, cross-national study of this sort, there is also a potential problem of multicollinearity. Kennedy (2001) suggests a test for multicollinearity in which each independent variable is regressed on all other independent variables (but see Lewis-Beck 1980). It is common not to worry about collinearity...
unless the R-squares from these equations exceed the R-squares in the original analysis (Kennedy 2001; Lewis-Beck 1980; Rudel 1989). In addition, we examine the variance inflation factor scores produced for each variable in our models. If the values of the variance inflation factor scores do not exceed a value of ten, then multicollinearity should not be a problem (Tabachnick and Fidell 2001).

Measurement

**Dependent Variable**

**Overurbanization.** Following previous studies (Bradshaw and Schafer 2000; Timberlake and Kentor 1983; Walton and Ragin 1990), we use the unstandardized residuals produced by regressing the level of urbanization for 1997 on gross national product per capita for 1997, as a measure of overurbanization. Countries with large positive residuals are considered overurbanized relative to their level of development, while countries with large negative residuals are said to be underurbanized relative to their level of development. The lagged dependent variable is constructed in the same way as the dependent variable, yet it is measured in 1980. We log both the dependent and the lagged dependent variable to correct for their skewed distributions. By logging the dependent and lagged dependent variables, we reduce the potential problem of heteroskedasticity in our analysis (Kennedy 2001).

**Independent Variables**

**Level of Deforestation.** The level of deforestation is measured as the percentage change in hectares of forested area in a developing country between 1980 and 1990. The data are based on estimates from the Food and Agriculture Organization of the United Nations (World Bank 1998). Rural-push and urban-pull theory suggests a positive relationship between the level of deforestation and overurbanization in a developing country.

**Environmental Sustainability Index.** The World Bank recently developed a measure of genuine savings as an indicator of environmental sustainability (World Bank 2000). This composite index is equal to (1) net domestic savings plus (2) expenditures on education minus (3) energy depletion, (4) mineral depletion, (5) net forest depletion, and (6) carbon dioxide damage (see Hamilton 2000 for a complete discussion of the construction of this index). High scores on the index are indicative of a high level of environmental sustainability. The variable is measured in 1980 and is logged to correct for its skewed distribution. Rural-push and urban-pull theory hypothesizes a negative relationship between the level of environmental sustainability and the level of overurbanization in a developing country. This use of alternative model specifications or the building of dimensions of variation into an analysis is a useful tactic in cross-national research (London and Ross 1995). The sequential use of cognate but distinct indicators of one or more independent variables can shed considerable light on the complexity and dynamics of the issue under examination. If our various indicators of environmental scarcity
exhibit similar effects on overurbanization, then our confidence in the generality of the hypothesis that environmental conditions contribute to the movement of people from rural to urban areas is enhanced.

**Agricultural Density.** To operationalize the level of agricultural density, we employ a measure of total hectares of arable land per capita for 1980 (World Bank 2000). Rural-push–urban-pull theory suggests a positive relationship between rural adversity operationalized by rural density and overurbanization.

**Level of Political Democracy.** Bollen’s (1983) index of political democracy for 1980 is used to test the degree to which freely elected and open regimes respond to popular demands for solving development problems such as overurbanization. Varying between zero and one hundred, this measure is a composite index based on six indicators: (1) freedom of the press, (2) government sanctions, (3) tolerance of political opposition groups, (4) fairness of elections, (5) methods of selecting executives, and (6) methods of selecting legislators. Political modernization theorists would expect a negative relationship between this variable and the level of overurbanization.

**International Nongovernmental Organization Density.** There is some precedent in the quantitative, cross-national literature to test hypotheses of political modernization theory by looking at variables other than the level of democracy in a developing country (Bradshaw and Schafer 2000; London and Ross 1995; Schafer 1999). In particular, an active civil society has the potential to decrease overurbanization in the developing world. Following previous cross-national studies that examine the impact of civil society on overurbanization, we include a variable that measures the impact of INGOs on overurbanization. To assess the effect of an active civil society on this development problem, we include a variable that measures the INGO density in a country for 1977 (Bradshaw and Schafer 2000; Schafer 1999). We calculate this variable by taking the total number of INGOs in a country in 1977 and dividing it by the country’s population in 1975 (Taylor and Jodice 1983). The distribution of INGO density is highly skewed, so this variable is logarithmically transformed. Political modernization theory predicts a negative relationship between INGOs and level of overurbanization.

**Political Protest Density.** As an alternative to the international nongovernmental organization variable, we include a variable measuring the number of political protests per capita in a country between 1975 and 1979 to further test political modernization hypotheses that an active civil society should decrease overurbanization (London and Ross 1995; Muller 1988). The variable is calculated in the same way as the INGO density measure. The variable is logged to correct for its skewed distribution. A political protest is a nonviolent gathering of people organized for the announced purpose of protesting against a government or one or more of its leaders; against a government’s ideology, policy, intended policy, or lack of policy; or against a government’s previous action or inaction (Taylor and Jodice 1983). Since the nongovernmental organization and the protest indicators measure slightly different aspects of civil society, we examine their effects in separate sets of equations.

**Population Growth Rate.** The population growth rate is calculated as the average

**Level of Economic Development.** As is standard in such analyses, it is incumbent for the researcher to take into account a nation’s level of development to ensure that any effects discovered are independent of nation’s level of wealth. In this regard, we employ a measure of energy consumption per capita for 1975 (Taylor and Jodice 1983). This variable is logged to correct for its highly skewed distribution. All other things being held equal, economic modernization theory suggests there should be a negative relationship between this variable and overurbanization.

**Commodity Concentration Ratio.** Commodity concentration is the value of a nation’s most important export commodity measured as a percentage of its total exports (Taylor and Jodice 1983). This is a widely used indicator of export or classical dependency (Ehrhardt-Martinez 1998; London and Williams 1990). This variable is measured for 1975 and indicates the degree to which peripheral nations rely on a single commodity and are vulnerable to market fluctuations for their export earnings. We log this variable to correct for its skewed distribution. As described previously, a positive relationship is expected between commodity concentration and overurbanization.

**Level of Multinational Corporate Penetration.** This variable is the end-of-year stocks of developed countries’ foreign direct investments in a given host country (Muller 1988). This measure, frequently employed in previous quantitative, cross-national studies, is available for 1975 (Muller 1988; Schafer 1999). The variable is logged to correct for its skewed distribution. According to dependency arguments described previously, foreign investment is hypothesized to have a positive effect on overurbanization.

**IMF Conditionality Index.** This index is the sum of four variables: (1) the number of debt renegotiations between a country and an international financial body (i.e., private bank or multilateral lender), (2) the number of debt restructurings experienced by an indebted nation, (3) the number of times a country used an IMF Extended Fund Facility, and (4) the total IMF loans received by a country as a percentage of its allocated quota (Schafer 1999; Walton and Ragin 1990). The variable is measured for the period 1975-90. The preceding four components of the index are converted to z-scores and summed. We log this variable to correct for its skewed distribution. Dependency theorists claim that the policies of international lending institutions have severely intensified dependency relationships between the core and periphery, thereby increasing overurbanization.

**FINDINGS**

Table 1 presents the results for our panel regression analysis estimating the effects of both internal and external variables on overurbanization for 1997. Equations 1.1, 1.3, and 1.5 include the lagged dependent variable, the level of deforestation,
### TABLE 1
Estimates of Overurbanization for 1997 Controlling for Deforestation and Other Independent Variables

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<th>Equation 1.6</th>
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<td>.001**</td>
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<td></td>
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<td>Level of IMF conditionality, 1975</td>
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<td>.081**</td>
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Note: The first number is the unstandardized coefficient, the second number is the standardized coefficient, and the third number in parentheses is the t-value.

*p < .10; **p < .05.
a Singapore is removed from the analysis because it is an influential case.
the level of political democracy, the level of nongovernmental organizational density, the level of agricultural density, the level of economic development, the population growth rate, and a measure of dependency. As an alternative indicator of civil society, we substitute the level of political protest density for the level of nongovernmental organization density in equations 1.2, 1.4, and 1.6. Equations 1.1 and 1.2 include the commodity concentration measure; equations 1.3 and 1.4, the multinational corporate penetration measure; and equations 1.5 and 1.6, the IMF conditionality measure. Again, we follow the common rule of thumb of maintaining a ratio of between five and ten cases to every predictor in order to increase the stability of our findings, thus enhancing confidence in the robustness of our results.

The overall pattern of the results in Table 1 can be summarized in the following manner. Let us begin by focusing our attention on the variables suggested by rural-push and urban-pull theory. In particular, the coefficients for the level of deforestation are positive and significant in all equations, 1.1 through 1.6. This consistent finding indicates support for rural-push and urban-pull theory that high levels of deforestation lead to high levels of overurbanization, as people are pushed from rural to urban areas. Second, the coefficients for the level of political democracy are negative and significant in equations 1.1 through 1.6. Therefore, we find support for arguments put forth by the political modernization perspective that democratic regimes are more likely to be responsive to public opinion, social movements, and special interest groups concerned with alleviating development problems such as overurbanization. Third, the number of INGOs maintains a negative and significant effect on overurbanization in equation 1.3, while the number of political protests maintains a negative and significant effect on overurbanization in equations 1.2, 1.4, and 1.6. Our results clearly suggest that civil society makes a dramatic difference in the well-being of the population of a developing country by helping to reduce problems in rural areas and alleviate the need for urbanward migration. Fifth, the population growth rate maintains a positive and significant effect on overurbanization in all six equations in Table 1. This finding supports the hypothesis suggested by neo-Malthusian theory that population growth leads to high levels of overurbanization. Sixth, the level of economic development and the level of agricultural density fail to predict any significant variation in overurbanization. This finding fails to support both economic modernization arguments that high levels of development tend to decrease overurbanization in a developing country and traditional rural-push and urban-pull arguments that high levels of agricultural density tend to increase overurbanization in a developing country.

Up to this point, we have considered only the significant effects of the various internal or intranational variables. However, the findings pertaining to the external or international variables suggested by dependency call for comment as well. In equation 1.4, we find that the level of multinational corporate penetration maintains a positive and significant relationship with overurbanization. In equations 1.5 and 1.6, the IMF conditionality index maintains a positive and significant relationship with overurbanization. Transnational economic linkages associated with multinational corporations and international lending institutions contribute to overurbanization throughout the developing world. It is important to note that
TABLE 2
Estimates of Overurbanization for 1997 Controlling for Environmental Sustainability and Other Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>Equation 2.1</th>
<th>Equation 2.2*</th>
<th>Equation 2.3*</th>
<th>Equation 2.4*</th>
<th>Equation 2.5</th>
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<td>.985**</td>
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<td>.860</td>
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<td>(2.768)</td>
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<td>−.001**</td>
<td>−.001**</td>
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<td>−.001**</td>
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<td>−.178</td>
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<td>(2.063)</td>
<td>(1.895)</td>
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<td>−.353*</td>
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<td>(1.599)</td>
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<tr>
<td>Political protest density, 1977−79</td>
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<td>.516**</td>
<td>−.511**</td>
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<td>(0.540)</td>
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<td>.198**</td>
<td>.352**</td>
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<td>.249**</td>
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<td>(.140)</td>
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<td>(.327)</td>
<td>(1.089)</td>
<td>(.356)</td>
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<td>−.005</td>
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<td>.025**</td>
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<td>.861</td>
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</table>

Note: The first number is the unstandardized coefficient, the second number is the standardized coefficient, and the third number in parentheses is the t-value.

* p < .10; ** p < .05.

*Singapore is removed from the analysis because it is an influential case.
we do not find support for hypotheses suggested by dependency theory that economies based on exports tend to increase overurbanization as the commodity concentration ratio is not significant; see equations 1.1 and 1.2.

Let us shift our attention to Table 2. It has the same pattern of variable organization as Table 1, although we replace the level of deforestation from Table 1 with an index of environmental sustainability.

The findings presented in Table 2 continue to underscore the importance of environmental conditions in the overurbanization process. Specifically, the environmental sustainability index maintains a negative and significant effect on overurbanization in equations 2.1, 2.3, 2.4, 2.5, and 2.6. Obviously, high levels of environmental sustainability are associated with low levels of overurbanization. It is important to note that overall, as in Table 1, most variables maintain their direction and level of significance. The level of political democracy maintains a negative and significant effect on overurbanization in all six equations. The political protest variable maintains a negative and significant effect on overurbanization in all equations in Table 2, while the INGO variable is significant in equation 2.5. Moreover, the population growth rate is positive and significant in five of six equations in Table 2. Finally, the coefficients for the level of multinational corporate penetration and the IMF conditionality index also remain positive and significant, see equations 2.3 through 2.6.

**DISCUSSION AND CONCLUSION**

What are the theoretical implications of the results presented in this study? Various demographic, economic, political, and social factors found to predict overurbanization in previous cross-national studies continue to explain this development problem. First, we find that a high population growth rate in a developing country may foster high levels of overurbanization, as suggested by neo-Malthusian theory. Second, dependency relationships based on multinational corporations and international lending institutions lead to higher levels of overurbanization. Third, we reconfirm political modernization hypotheses first observed by Bradshaw and Schafer (2000) that an active civil society taking the form of international nongovernmental organizations tends to reduce overurbanization.

However, we build on Bradshaw and Schafer’s study by finding that another dimension of civil society also helps to reduce overurbanization. In particular, we find that political protests are negatively associated with overurbanization. This finding supports political modernization hypotheses that local populations in rural areas are organizing to protect the natural resource bases on which their livelihoods depend and eliminating the income, risk, and health effects that often lead to urbanward migration. Moreover, we find support for another aspect of political modernization theory, namely, that democratic governments in a developing country play an important role in decreasing overurbanization by responding to the needs of civil society.

Although previous research (Bradshaw 1985, 1987; Bradshaw and Schafer 2000; Crenshaw and Oakey 1998; Firebaugh 1979; Kasarda and Crenshaw 1991; Kentor
1981; London 1987; Timberlake 1987; Timberlake and Kentor 1983) has provided invaluable insights into developing an understanding of overurbanization, it has neglected the role environmental degradation plays in increasing overurbanization by precipitating rural-to-urban migration. We have begun to fill this gap in the literature by conducting the first study of overurbanization to include predictors linked to environmental degradation. Our findings are quite clear that developing countries suffering from various forms of environmental damage are prone to overurbanization. An indicator of deforestation exerts a positive and significant effect of overurbanization, and an indicator of environmental sustainability consistently exerts a negative and significant effect on overurbanization with all other things being held equal.

Therefore, the ultimate conclusion of this study pertains to hypotheses suggested by newer variants of rural-push and urban-pull theory in the emergence of environmental factors as important determinants of overurbanization even when controlling for the traditional demographic, economic, political, and social explanations of overurbanization. Clearly, sociologists can no longer afford to ignore the role of the environment in influencing development processes (Bell 1999; Harper 2001). There must be a willingness to examine relationships between social and environmental variables in sociological analyses. It is time for our discipline to acknowledge that the welfare of human beings is inextricably interrelated with the condition of our earthly habitat. Carefully specifying the theoretical articulations between approaches focusing on the environmental dynamics (i.e., the rural-push and urban pull perspective) and approaches focusing on economic, political, and social dynamics (i.e., the economic modernization, political modernization, and dependency perspectives) should become a pressing prerequisite for further research progress.

NOTES

1. The Lewis-Beck (1980) test was applied to all equations for Tables 1 and 2; see the regression diagnostics section above. Results of this test (available from the authors on request) showed no R-squares exceeding the original R-squares. In addition, none of the variance inflation factor scores (available from the authors on request) exceeded a value of ten. Given the results of both of these regression diagnostic procedures, multicollinearity did not appear to be a problem in this analysis (Kennedy 2001; Lewis-Beck 1980; Rüdiger 1989).

2. We tested another indicator suggested by neo-Malthusian theory by including a country’s level of rural population density for 1980 in all of our models. However, none of these tests were significant.

3. We tested for the presence of a curvilinear relationship between the level of economic development and the level of overurbanization. We tested this nonmonotonic hypothesis using a quadratic polynomial equation in which the energy consumption indicator and its square were entered into our models. However, none of these tests were significant.

4. As a check for robustness of our findings, we look for influential cases (as measured by the Cook’s distance statistic) that if included in or excluded from our sample would substantively change our results. For equation 1.4, we find that Singapore is an influential case. When Singapore is included in our sample, all of the predictors found to be significant in
equation 1.4 maintain their significance level. For the equation with Singapore included in the analysis, the overall adjusted $R^2$ drops from .873 to .706. A similar pattern emerges in equations 2.2, 2.3, and 2.4. The exclusion of this case from any of these equations does not change any of our major conclusions, but for the models presented in our tables we have decided to present the more robust version of our results that exclude Singapore from the sample.

REFERENCES


