Globalization, Development, and International Migration:
A Cross-National Analysis of Less-Developed Countries, 1970-2000

A paper submitted for presentation at the Annual Meeting of
the Population Association of America

Matthew R. Sanderson
Lehigh University
Department of Sociology
681 Taylor Street
Bethlehem, PA 18015
matthew.sanderson@lehigh.edu

Jeffrey Kentor
University of Utah
Department of Sociology
380 S 1530 E, Rm. 301
Salt Lake City, UT 84112-0250
jeffrey.kentor@soc.utah.edu

ABSTRACT

It is widely argued that globalization and economic development are associated with international migration. However, these relationships have not been tested empirically. We use a cross-national empirical analysis to assess the impact of global and national factors on international migration from less-developed countries. An analytical framework is developed that uses several modeling techniques to analyze panel data on a set of less-developed countries from 1970 to 2000. Three central findings emerge from these analyses. First, foreign direct investment has a significant, differential effect across sectors of the economy. Second, economic development has a significant, nonlinear effect on net emigration levels (the so-called "migration hump"). Finally, we find a strong cumulative causation effect of migration, meaning that migration has a strong internal momentum once it has been initiated. The implications of the findings are discussed in the context of contemporary migration theory.

INTRODUCTION

Historically, cross-national flows of labor and capital have influenced the structure and growth of the global economy (Held, McGrew, Goldblatt, and Perraton 1999). The contemporary global economy, however, is distinct in terms of the magnitude and frequency of labor[1] (Castles and Miller 2003) and capital (Dicken 2003) flows across national boundaries. An estimated 75 million migrants lived abroad in 1960; in 2005, the stock of international migrants reached 191 million – a 155 percent increase in 45 years (UN 2006b). While representing three percent of the world's population, the stock of international migrants is equivalent to the sixth-most populous country in the world.

The movement of capital has also increased. Between 1980 and 2000, the worldwide stock of foreign direct investment (FDI) increased 991 percent to $5.79 trillion in 2000

(UNCTAD 2005) – a level larger than the current size of the economy of each country in the world except the United States (WB 2006a). Indeed, FDI now represents approximately 50 percent of total world capital flows (Stallings 2007).

International migration is widely recognized as an integral component of globalization (Castles and Miller 2003; Sassen 2007). International migrants facilitate globalization processes by linking together disparate peoples and places into an increasingly single, shared global political-economic context (Glick Schiller, Basch, and Szanton Black 1995; Portes, Guarnizo, and Landolt 1999). While we recognize the importance of understanding how cross-national population movements impact receiving societies and structure the global political-economic context, we focus here on how globalization influences international migration patterns from sending countries.

Indeed, there is growing acknowledgement among scholars and public policy practitioners that globalization is associated with the increasing scale and scope of international migration:

> "…large-scale movements of people arise from the accelerating process of global integration…migrations are not an isolated phenomenon: movements of commodities and capital almost always give rise to movements of people" (Castles and Miller 2003: 4).
>
> "…globalization has increased the number of people with the desire and capacity to move to other places…international migration today cries out for a global discussion" (Annan 2006).

Yet despite increasing recognition of the relationship, it has become apparent that relatively little is known about the fundamental structural causes of international migration. This deficiency in the knowledge base is often expressed as an appeal for a better understanding of the basic, underlying, 'root' causes of international migrations:

> It is essential to address the root causes of international migration to ensure that people migrate out of choice, rather than necessity" (Sheikha Haya Rashed Al Khalifa 2006).

Our knowledge of the structural root causes of international migration is impeded by the paucity of cross-national empirical analyses. Recently, migration theories have been synthesized into a coherent analytical framework (Massey 1999b), but empirical research has not yet caught up with theoretical advances. As a result, our knowledge of international migration continues to be derived largely from country-specific case studies, despite the recognition that migration is increasingly a global, or supra-national, phenomenon:

> "…what we have today is mostly an amorphous mass of data on immigration to different countries and a series of concepts whose scope seldom exceeds those of a particular nation-state" (Portes 1997: 819).

The limited scope of previous analyses has left fundamental questions about international migration unanswered: How does globalization influence the prevalence of international migration? What aspects or dimensions of globalization influence international migration? Does globalization impact international migration independently from the effects of economic development?

The response to these gaps in our knowledge base is clear:

> "Needed are explicitly comparative projects that focus on research topics at a higher level of abstraction than those guiding policy concerns and that employ a common cross-national methodology." (Portes 1997: 819)

We address these questions with a cross-national empirical analysis of less-developed countries (LDCs). We limit the analysis to LDCs for two reasons. First, the majority of international migrants originate in LDCs: two out of every three migrants moves either from a LDC to a developed country or from a LDC to a LDC (Castles and Miller 2003; UN 2006a). An analysis of emigration from LDCs thus assesses the source of a large portion of international

migration. Second, the processes driving migration from developed countries are qualitatively different from the processes driving migration from LDCs (cf. OECD 2004). Thus, it is important not to confound these divergent processes.

The study of international migration has generated a large, variegated, and well-developed theoretical and empirical literature (see Massey, Arango, Hugo, Kouaouchi, Pellegrino, and Taylor 2005 for a review and integration of this literature). In addition to sociology, contributors come from across the social sciences (cf. Borjas 1989; Daly 2006; Freeman 1995; Hatton and Williamson 2006; Hollifield 2004), and studies employ a wide array of methodologies to examine migration from the micro-level to the macro-levels of analysis (cf. Massey 1999b). Because we are interested in potential causes of migration that transcend specific countries, we focus specifically on macrostructural[2] explanations of international migration from LDCs that are related to global dynamics. While the role of explanations situated at the micro-level – such as individual and household decision-making – or mezzo-level – such as migration networks – should not be diminished, examining large-scale structural explanations of international migration, particularly cross-nationally, is the most appropriate strategy for developing our understanding of the relationship between globalization and international migration (Portes 1997). Our study would be considered "structural" and "globalist" using Zolberg's (1989) schema and "historical-structural" using Massey et al's (2005) typology.

We begin with a discussion of the roles of two important macrostructural determinants of international migration: economic development and foreign direct investment (FDI). We then use a cross-national empirical analysis to test hypotheses about the impacts of these factors on international migration levels from LDCs. We conclude by discussing the implications of the findings for structural theories of international migration and offer some suggestions for future research on the relationship between globalization, development, and migration.

MACROSTRUCTURAL EXPLANATIONS OF MIGRATION IN LDCs

Economic Development and the Migration Transition

Structural investigations of international migration have commonly focused on the level of economic development as an explanation of international migration (Ghosh 1992; Hatton and Williamson 1994; Massey 1988; Papademetriou and Martin 1991). It is often argued that the relationship between development and migration takes the functional form of an inverted-U (Ackerman 1976b), or a "migration hump" (Martin and Taylor 1996) as societies pass through the "mobility transition" (Zelinsky 1971). Initially, economic development has a disruptive or destabilizing effect on the society that increases emigration levels for several reasons (Massey 1988). First, capital is substituted for labor on an increasingly larger scale, rendering large amounts of labor redundant. Second, formerly communal lands are enclosed and consolidated into larger holdings that are more amenable to capital-intensive agricultural production methods, reducing the ability of inhabitants to provide for their own subsistence. Further, the creation of markets and production for exchange undermines the social fabric of subsistence-based economies, weakening the ties of inhabitants to the land and community. Finally, transportation and communication infrastructures are expanded, which facilitates migration by reducing the associated costs and risks.

As economic development progresses over time, these disruptive effects are reduced. The internal labor market transitions from an agricultural to an industrial and (eventually) a service based economy, shifting a significant share of the labor force from the primary sector into the secondary and tertiary sectors (cf. Taylor 2006: p. 10). A demographic transition also occurs, as birth and death rates decline and life expectancy increases (cf. Kirk 1996). These structural transformations cause living standards to rise, and economic growth becomes self-sustaining. At this point, the country 'rounds the hump' and transitions from being a net exporter of migrants to being a net receiver of migrants (Hatton and Williamson 1998).

While it is a relatively common explanation of migration patterns, the mobility transition remains a "stylized fact" based upon the specific historical pattern of nineteenth-century European migration (Hatton and Williamson 1998: 13). The theory has not been tested

empirically in cross-national multivariate models, or in models that include non-European countries in the twentieth century. As a result, uncertainty remains about the mechanisms through which development impacts migration. It is possible that both development, or a lack thereof, may generate migration: "…the empirical evidence suggests that development encourages new streams of migrants…by the same token, lack of development can lead to massive, poverty-driven and often uncontrolled migration" (UNCTAD 1996: 26, emphasis added).

In addition, there is also considerable uncertainty about the time span necessary for development to produce the transition from net emigration to net immigration. Ackerman (1976a: p. 26) states the following with respect to Swedish emigration to the United States in the early twentieth century: "We can theorize that an introductory phase with only a few scattered acceptances is followed by a strong growth phase, which of course, can vary in relation to external circumstances. This leads to a saturation phase, after which the growth curve declines during a longer or shorter period of time." While Martin and Taylor (1996: p. 26) think that "…the short run may last a decade or longer," Tapinos (1991) estimated that economic growth rates of six to eight percent *annually* over *50 years* would be required in order to equalize the gross national product per capita of countries in Eastern Europe and North Africa with that of France. Similarly, the European Bank for Reconstruction and Development (1993) projected that Eastern European countries would need *35 years* in order for per capita incomes to reach *half* the level of incomes in the average industrialized country.

Thus, the utility of the migration transition theory for contemporary international migration patterns in LDCs remains questionable (Appleyard 1992; Ghosh 1992; Papademetriou 1989; Papademetriou and Martin 1991). We address concerns about the migration transition theory by attempting to model it in a representative sample of LDCs over specific time intervals in the late-twentieth century. We further develop structural migration theory by shifting the focus away from the development-migration nexus toward the specific structural mechanisms that may

underlie development and migration in contemporary LDCs. In this respect, the role of foreign direct investment is important.

THE ROLE OF FOREIGN DIRECT INVESTMENT

The growth in foreign direct investment has integrated LDCs into global trade and production networks (Chase-Dunn 1998; Gilpin 2001). Economic growth requires capital. Lacking adequate domestic sources of capital, LDCs often attempt to attract foreign capital in order to develop infrastructure and increase output in domestic economic sectors. As a result, FDI represents a greater percentage of total investment capital in LDCs than in developed countries (Dixon and Boswell 1996). As a principal source of capital in LDCs, then, foreign investment plays an important role in the process of international migration through its effects on international trade and economic development. We review two competing accounts the relationship between FDI and migration below.

FDI as the Transfer of Emigration-Reducing Resources

The macroeconomic literature generally suggests that FDI should decrease emigration over time. The emigration-reducing effects of FDI, however, differ by the length of time horizon considered. In the short-term, FDI reduces emigration by providing immediate employment opportunities at wages that usually exceed those found in domestic firms (Sauvant, Mallampally, and Economou 1993).

Over a longer term time horizon, FDI decreases emigration by promoting economic growth. FDI promotes economic growth in two specific manners. First, FDI is not only a transfer of investment capital, it is also a transfer of technological capacity from developed countries to LDCs (Sauvant, Mallampally, and Economou 1993). Increased technological capacity improves efficiency, raises productivity, and promotes economic growth. Second, FDI transfers knowledge about production processes that raises the quality of human capital in the domestic economy (Sauvant, Mallampally, and Economou 1993). Increased levels of human capital also raise the productivity of labor and promote economic growth.

By promoting economic growth in LDCs, FDI should reduce international income discrepancies, a significant impetus to international migration (UNCTAD 1996). Transfers of capital, technology, and knowledge about production processes to LDCs increase labor productivity levels. Economic theory suggests that productivity levels are closely associated with wages (Borjas 1989). Thus, rising levels of labor productivity should be associated with higher wages. To the extent that wages rise in LDCs relative to developed countries, emigration levels should decline, as the need to seek employment at higher wages is reduced.

Concomitant trends toward rising levels of international migration and increases in foreign direct investment since the 1970s raise important questions about the role of FDI in reducing emigration from LDCs. In light of these trends, we now turn to an alternative account of the relationship between FDI and migration.

FDI as a Mobilizing and Disrupting Factor

Sassen (1988) provides the most comprehensive theoretical and empirical treatment of the relationship between foreign investment and emigration. Focusing on the primary (i.e. export agriculture) and secondary (i.e. export manufacturing) sectors of the economy,[3] Sassen contends that foreign investment has three effects on social structures in LDCs that make emigration more likely over time: FDI mobilizes segments of the population through direct incorporation as wage labor or by indirectly promoting rural-urban migration streams; FDI disrupts traditional work structures by feminizing labor structures and mobilizing labor; and FDI generates cultural-ideological linkages between LDCs and developed countries by westernizing segments of the labor force (Sassen 1988).

FDI mobilizes segments of the population by creating "growth poles" (cf. Hite 2004) that attract immigration to expanding or developing areas in the country. The mobilizing effect of FDI, however, is qualitatively different across sectors of the economy. FDI in the primary sector stimulates immigration into rural areas where natural resources are more prevalent (Bunker 1984; 1985; Godfrey 1990; Muradian, Martinez-Alier, and Correa 2003). Rural inhabitants and

immigrants are incorporated directly as wage labor on large agricultural plantations, logging sites, mining sites, and in other resource extractive industries (Ciccantell 1999; Roberts 1995). Wages on foreign-financed sites often exceeds the national average, thus providing the resources for increased mobility (Sauvant, Mallampally, and Economou 1993). Employment growth on these sites, however, often is not sufficient to absorb either the large numbers of inhabitants displaced or the level of immigration into the area. As a result, FDI in the primary sector indirectly mobilizes segments of the population by increasing the prevalence of rural-urban migration, which exacerbates urbanization levels in LDCs (Browder and Godfrey 1997). Similarly, primary sector FDI indirectly mobilizes the population by developing transportation infrastructures, which opens up previously inaccessible areas of the country, and increasing rural-rural migration, particularly to frontier areas (Anderson 1990).

FDI in the secondary sector stimulates immigration into urban areas where there exists an adequate industrial infrastructure to support manufacturing operations (Sassen 1988). These operations typically occur in export-processing zones (EPZs) where trade barriers are reduced or eliminated in order to attract foreign capital and generate foreign exchange. These firms often utilize a large proportion of female labor for the production of textiles, garments, electronics, and chemicals among other goods (Fernandez-Kelly 1983; Sainz 1998). Secondary sector FDI thus mobilizes the population by spurring rural-urban migration among females and directly incorporating them as wage-labor in urban areas. However, those unable to secure employment in manufacturing firms are often incorporated into the expanding informal sectors of urban areas as subcontracted labor, cooks, maids, nannies, housekeepers, and sex workers (Akabzaa 2000; Ehrenreich and Hochschild 2004).

Mobilization thus involves a disruption of traditional household work structures, which makes emigration more likely (Sassen 1988). Men who migrate to take off-farm employment in FDI-generated growth poles in rural areas are not available to work the land and maintain subsistence levels for the household. The work roles of women are expanded to include

agricultural work in addition to household reproductive tasks. This is often an untenable arrangement over longer periods of time, and can promote the out-migration of women in search of work in urban areas (Bilsborrow 2002). Thus, the disruptive effects of foreign investment on traditional work structures are twofold: "young men are left without mates and partners, (and) the households are left without a key labor factor" (Sassen 1988: 97).

Foreign investment also promotes emigration from LDCs by creating material and cultural-ideological linkages with the source country (Sassen 1988). As a fixed capital investment, foreign investment typically develops transportation and communication infrastructures in LDCs. While built to move goods, capital, and information, this infrastructure also facilitates the movement of people. The material linkage between countries is clear where transportation infrastructures cross national boundaries, as in the case of railroads and highways that link Mexican communities to the U.S. (Massey, Durand, and Malone 2002). However, roads connecting manufacturing plants to seaports and rail lines linking mineral mines in remote interior areas to urban areas provide similar linkages with developed countries, making emigration from LDCs more likely than would be the case in their absence.

Foreign investment also generates cultural-ideological linkages between LDCs and investing countries. Indeed, large-scale foreign direct investment has a "long recognized" westernizing effect on inhabitants on LDCs: "These workers are using their labor power in the production of goods or services demanded by people and firms in the U.S. or any other highly developed country. The distance between a job in the off-shore plant or office and in the on-shore plant or office is subjectively reduced. Under these conditions emigration may begin to emerge as an option actually felt by individuals" (Sassen 1988: 19-20). These FDI-generated cultural-ideological linkages connect the relatively small portion of the populace that works in foreign investment-sponsored facilities to developed countries. However, the effects of such linkages on emigration are broader, as such individuals also create a "linkage for potential migrants" through social networks (Sassen 1988: 20).

Domestic and Foreign Investment

The disruptive effects of FDI are exacerbated by the tendency of FDI dominance to inhibit the growth of forward and backward economic linkages (Dixon and Boswell 1996). Economic growth occurs through the linkages created between firms and industries in the domestic economy. In an economy with well-developed linkages, economic growth occurs when an increase in expenditure (investment or consumption) in one sector of the economy generates further increases in expenditure (investment or consumption) in other sectors of the economy through what Keynesian economics defines as the multiplier effect. This occurs when, for example, a firm producing cotton t-shirts purchases supplies from another domestic firm (a backward linkage), or when the firm sells its t-shirts as an input to another domestic firm (a forward linkage). Intra-economy linkages, then, constitute economic development per se: "…development is essentially the record of how one thing leads to another, and the linkages are that record" (Hirschman 1977: 81).

An economy with insufficient linkages is an economy in which economic growth is hampered because the multiplier effect is impeded. In this respect, foreign investment is less beneficial to an economy than domestic investment because domestic firms are more likely to foster intra-economy linkages than foreign-controlled firms (Firebaugh 1992: 107). This is to say that domestic investment is more likely to foster intra-economy linkages than foreign investment in large part because domestic investment, "…is more likely to have familial or other ties, to use common technology, (and) to be culturally familiar…" (Dixon and Boswell 1996: 545). Because domestic investment is more likely to generate intra-economy linkages, it is more productive than foreign investment in promoting economic growth. Indeed, foreign investment has been shown to be three times less productive than domestic investment in promoting economic growth in LDCs (Dixon and Boswell 1996; Firebaugh 1992). Thus, "from the host country's perspective, all capital is not equal; the source *does* matter. Homegrown capital outperforms imported capital" (Firebaugh 1992: 124).

Slower economic growth can translate into slower employment growth in the domestic economy. A drag on employment growth in LDCs is problematic because population growth rates in LDCs generally exceed those found in developed countries (Birdsall, Kelley, and Sinding 2001). Thus, to the extent that foreign investment is less productive than domestic investment, economies characterized by higher levels of foreign investment penetration are generally less able to absorb surplus labor. Moreover, foreign investment penetration exacerbates the problem of inadequate labor absorption by generating a surplus labor supply in the first place (Sassen 1988).

These unintended consequences, or "negative externalities" (Dixon and Boswell 1996) of foreign investment make emigration more likely over time. Or, stated differently, the absence of FDI would minimize emigration: "In an 'isolated' country, that is one lacking extensive direct foreign investment, emigration would be quite unlikely to emerge as an option" (Sassen 1988: p. 20).

Focusing on foreign investment allows the analysis to consider not only how the *level* of economic development influences migration, but also how the *type* of economic development influences migration. Moreover, analyzing the effect of foreign investment on international migration in LDCs provides an investigation of how the broader, global political-economic context influences migration, as FDI serves to integrate LDCs in broader trade and production networks that characterize the global economy (Bornschier and Chase-Dunn 1985; Gilpin 1975; 2001).

Empirical Studies of FDI and International Migration

Empirical investigations of the relationship between foreign investment and migration are sparse. The few studies that have examined the relationship have produced conflicting results. Massey and Espinosa (1997) examine 41 predictors of migration to the United States from Mexico. The rate of growth in foreign investment decreased the odds of a first and repeat migration to the U.S., which they contended was due to the tendency of foreign investment to promote employment growth.

Yang (1998), however, demonstrated that a composite measure of U.S. trade and foreign investment increased the prevalence of emigration to the U.S. from LDCs over the period, 1984-1993. This effect was independent of the population growth rate, the aggregated level of education, and the GNP growth rate.

Ricketts (1987) focused explicitly on the relationship between foreign investment and migration in his analysis of 18 Caribbean countries over the period 1970-1979. He found that foreign investment increased both legal and illegal migration to the U.S. after controlling for GNP per capita, population growth rate, and dummy variables indicating whether the country was predominantly English-speaking and whether the country was an island.

More recently, Sanderson and Kentor (2008) find that stocks of foreign investment have a ten-year lagged positive effect on net emigration in LDCs between 1985 and 2000, net of relevant controls. They argue that this effect of FDI stocks on net emigration is due to the long-term negative effect of foreign capital dominance on economic growth.

DATA AND METHODS

Our dataset includes time-series of cross-section data (TSCS) pooled over the 1970-2000 period. Based upon Sanderson and Kentor's (2008) findings, we specify a ten-year lagged effect of FDI stock on net emigration. The analysis therefore pools TSCS data over five ten-year periods (1970-1980, 1975-1985, 1980-1990, 1985-1995, 1990-2000).

Countries Included in the Analysis

As discussed above, we limit our study to less-developed countries. The countries in our sample are selected on the basis of data availability. Countries are included in the analysis based upon three requirements: (1) data are available for the endogenous variable at time *t*; (2) data are available on all of the exogenous variables at time *t-10*; and (3) data on the variables are available at two time points. For example, a country is included in the analysis if it has data available on the endogenous variable at time *t* (measured in 1980 or 1985 or 1990 or 1995 or 2000) and on all of the exogenous variables at time *t-10* (measured in 1970 or 1975 or 1980 or 1985 or 1990). On

the contrary, a country would not be included in the analysis if it is missing data on the endogenous variable at time *t* or any of the exogenous variables at time *t-10*. Data must be available for the variables at two time points in order to estimate change within countries *and* between countries over time. The ability to exploit both forms of variation (between and within countries) is a key advantage of pooling time-series of cross-sectional data. Appendix C lists the countries used in the analysis and Appendix D presents the countries included in the analysis along with information on key variables.

This method of case selection produces unbalanced panels, with countries contributing different numbers of observations depending on data availability. The number of observations contributed by countries in our sample ranges from a minimum of two observations to a maximum of five observations. Analyses using unbalanced panel data structures are common in cross-national sociology (cf. Beckfield 2006; Huber, Nielsen, Pribble, and Stephens 2006; Lee 2005). Our final data set includes information for 19 LDCs, resulting in a sample of 59 observations.

This analysis advances previous empirical efforts in three ways. First, we test the effects of globalization and development against one another in the same model, allowing an assessment of the relative importance of each for international migration. Second, the analysis assesses the unique effects of two different aspects of globalization (international trade and foreign investment), and further, we decompose the effects of foreign investment across economic sectors. These refinements provide a clearer conceptualization of the processes in question. Third, we use a more current methodology that addresses statistical concerns with the methods used in previous work and examine a broader sample of countries over longer time horizon.

Dependent Variable

The dependent variable is the ***level of net emigration per capita***. These data are drawn from the World Bank's (2006b) *World Development Indicators* dataset. The World Bank estimates net migration as a residual after estimating population growth rates and birth and

deaths. While this measure may conceal migrations within the country and international migrations into and out of the country, we standardize net emigration on population in order to assess the relative share of the population that emigrates. This variable is logged to correct for skewness.[4]

Independent Variables and Controls

The independent variables of primary interest are ***stocks of foreign direct investment (FDI) decomposed by sector (primary, secondary), per GDP***.[5] FDI stocks are defined as the long-term accumulation of foreign investment flows and reflect the dominance of foreign capital in a given sector. These data are taken from the United Nations' *World Investment Directories* (1992; 1994; 1996; 2000; 2003) and the Organization for Economic Co-Operation and Development's *International Direct Investment Statistics Yearbook* (2001), and are logged to correct for skewness.

The level of international trade is also contended to be an important macrostructural factor that influences international migration levels in LDCs (Csimced 1990; UNCTAD 1996). Export production integrates LDCs into the global political-economic context (Chase-Dunn, Kawano, and Brewer 2000), reshaping labor markets in ways that impact migration levels into and out of the country (Ghosh 1992; Martin and Taylor 1996). While international trade and FDI may have similar effects on migration levels (Gonzalez and Maloney 2005), each represents a distinct component of globalization. Thus, it is important to analytically distinguish between the effects of trade integration and foreign capital when examining international migration (UNCTAD 1996). We therefore include the level of ***exports per GDP*** to control for the potential unique influence of trade on international migration. This variable is logged to correct for skewness.

We include controls for theoretically relevant intra-national variables including economic development, gross domestic investment, population size, and aggregate human capital level. These data are taken from the World Bank's (2006b) *World Development Indicators*. Economic

development is argued to be related to aggregate migration levels in a non-linear fashion to the extent that emigration levels increase with economic development, but eventually decrease as the domestic economy expands and provides sufficient employment for the population (Massey et al. 2005; Zelinsky 1971). We model the migration transition by including the ***level of GDP per capita*** and a ***quadratic term for GDP per capita***.[6]

Previous studies (Dixon and Boswell 1996; Firebaugh 1992) have argued that domestic investment and foreign investment may have differential effects on host economies. We control for this differential effect by including ***gross domestic investment per GDP*** in the analysis.

It is widely accepted in the international migration literature that migration is characterized by "young adult selectivity bias" (Williamson 1988). That is, individuals in the 20-29 age category have historically accounted for the highest proportion of international migrants (Brown and Bean 2006: 347; Weeks 2005: 285).[7] We thus include a measure of the percentage of the total population in the 10-19 age category in order to control for the ***age composition of the population***. It is necessary to use the 10-19 age category for this measure because we specify a 10-year time lag between the exogenous variables and the dependent variable.[8]

Previous studies have argued that international migration is a self-selective process in that migration becomes more likely at higher levels of human capital (Massey et al. 2005). We control for this effect by including a measure of ***gross secondary school enrollment per capita***.[9]

Nation-states affect population movements by determining the rules for such movements. The rules that constrain or enable population movements are, in turn, affected by the domestic political structure (Freeman 1995; Massey 1999a; Meyers 2000; Rowlands 1999). Democratic political structures are more likely to respond to public opinion and special interest groups concerned with issues of economic development, job creation, and migration than more repressive political structures. Thus, we include a measure of ***domestic political structure*** to account for the effect of the internal political structure and migration policies on emigration levels. Values on this variable range from -10 to +10, with lower scores indicating more

authoritarian political structures and higher scores indicating more democratic political structures. These data are taken from the Polity IV dataset (Marshall, Jaggers, and Gurr 2006).[10]

Finally, in order to capture time-specific effects that may affect the level of emigration but are not explicitly controlled for in the analysis (i.e. military conflicts, famines, refugee crises), we include a linear year term (Wooldridge 2006).[11] Appendices A and B present correlation coefficients and basic descriptive statistics for the variables used in the analysis.

The Difficulties in Modeling Dynamic Processes

Stated briefly, the basic problem is as follows: international migration is a dynamic process, meaning that current levels of the dependent variable are influenced by prior levels of that variable. Existing migrant social networks lower the costs and risks associated with movement abroad, increasing the ease with which future movements can occur (Massey et al. 2005). This is referred to as "cumulative causation," (Massey 1990; cf. Myrdal 1957) the "friends and family effect," (Levy and Wadycki 1973) and the "migration capital" effect (Taylor 1987).

A dynamic model requires the inclusion of a lagged dependent variable (LDV), or it will suffer from omitted variable bias (Keele and Kelly 2006). However, inclusion of the LDV raises other critical statistical concerns of residual autocorrelation, unobserved heterogeneity, and stationarity. These are difficult issues to resolve with the methods typically used in our discipline to study such processes. Hence, we are pressed to consider methods currently used by economists and political scientists, who have at least been aware of these issues for many years, even if there is little consensus in these fields as to how to best resolve these issues.

We take this opportunity to briefly outline these problems as they directly impact our choice of methods, and suggest various ways to resolve these very complex statistical concerns. Our discussion, however, is not a comprehensive one. Many of the issues raised involve numerous caveats and assumptions that would require a much more detailed discussion than space allows for here.

Macro-comparative sociologists originally modeled dynamic processes by including a LDV on the right-hand-side of the equation and using OLS to estimate the model. The dependent variable is regressed on the independent variables and the dependent variable measured at some prior time point. This is what has become known as a panel analysis in macro-comparative sociology (Chase-Dunn 1975; Jenkins and Scanlan 2001; Kentor 1998; London 1988; Shandra, Nobles, London, and Williamson 2004; Shandra, Nobles, London, and Williamson 2005). The LDV is also appealing on methodological grounds as it attempts to address issues of heterogeneity bias[12] and residual autocorrelation.[13] For these reasons, inclusion of the LDV gained widespread acceptance in longitudinal macro-sociological studies.

Despite its theoretical appeal, inclusion of LDVs raises a number of methodological concerns. Rather than using cross-sectional data and building in time lags, researchers are increasingly pooling cross-sectional data on countries over time in a single dataset, resulting in a time-series cross-section (TSCS) data structure. Because time is explicit in the TSCS data structure, it is possible to use more sophisticated estimation techniques to model dynamic processes without resorting to a LDV approach.

Two of the most common techniques used with TSCS data are random effects models (REMs) and fixed effects models (FEMs). These models include a country-specific term to address unobserved heterogeneity, rendering a LDV statistically redundant for this purpose. Similarly, if residual autocorrelation is at least partially an outcome of time-invariant, unit-specific effects, then both REMs and FEMs address the issue by including country-specific effects in the model, again making a LDV statistically redundant. Thus, because LDVs may lead to biased and inconsistent estimates, they are less defensible solely on methodological grounds when using methods that account for country-specific effects.

In addition to the issues of unobserved heterogeneity and residual autocorrelation, there is another issue inherent to time series data: stationarity. The analysis of time series data requires that the underlying data-generating process in the dependent variable is stationary. Technically, a

stationary time series is one in which the mean and variance of the variable is constant and finite over the time period it is analyzed. Stationary processes are not dependent upon time: they are not trended; they do not evolve over time; their mean and variance are constant and finite. Non-stationary processes are problematic because if the mean and variance of the variable change over time then it is difficult to statistically determine if the independent variable and the dependent variable are causally related or if their relationship is instead an outcome of a common third variable – time.

As is the case with the issues of unobserved heterogeneity and residual autocorrelation, the issue of stationarity can be addressed using a LDV approach. Including a LDV captures the tendency for dynamic processes to adjust to exogenous shocks over time. Alternatively, however, stationarity can be addressed within the FEM/REM framework by accounting for a country-specific effect that is persistent over time within countries but varies across countries. Thus, the LDV is not necessary for addressing stationarity from a purely statistical vantage.

There are statistical reasons, then, to exclude the LDV from the model. However, excluding the LDV from the model may not be appropriate on theoretical grounds. Most importantly, if the LDV is theoretically-meaningful, and it is excluded from the analysis, the model will suffer from omitted variable bias, and this could be worse than the bias introduced from including the LDV in the model (Keele and Kelly 2006).

A Dynamic Model of International Migration

After considering the issues discussed above, it is clear that the LDV is often statistically redundant when the model accounts for unobserved effects. Thus, on the bases of addressing residual autocorrelation, unobserved heterogeneity, and stationarity, the use of a LDV is not justifiable. However, it is also clear that both a LDV and unobserved country-specific effects should be included in the model specification to appropriately model a dynamic process. This strategy allows the researcher to determine whether true dynamics or country-specific effects are predominant in generating the outcome (Wawro 2002). The question is whether past outcomes

really influence present and future outcomes (i.e., a truly dynamic process) or whether past, present and future outcomes are instead the result of a common set of factors specific to a country. Unless the model includes both a LDV and unobserved country-specific effects, it is not possible to rule out the possibility that the dynamic relationship, captured by a LDV, is actually a result of factors that vary across, but not within, countries over time (Wawro 2002).

As discussed above, however, in most cases the LDV will be correlated with the unobserved effects, leading to several statistical problems. We outline a series of specification tests that address these issues, and discuss two methods that model a dynamic process: the REM with a first order temporal correction for residual autocorrelation (AR1) and the Arellano-Bond GMM dynamic panel data estimator. We emphasize, however, that no single modeling technique or specification test can resolve all of the quandaries posed by using TSCS data to estimate a dynamic process. Thus, our suggestions are accompanied with the caveats that: (a) there is no panacea; (b) many of the tests we discuss are only strictly valid under conditions that many TSCS data cannot satisfy; and (c) that data limitations may restrict the researcher's ability to completely address each of these issues.

Determining the Appropriate Dynamic Model

A sequence of preliminary specification tests must be conducted to determine the appropriate analytic model. First, it is necessary to test for stationarity in the time series process. Statistical tests such as the Fisher test and the Dickey-Fuller test, which test for the presence of unit roots, are available for this purpose. Second, it is necessary to test for residual autocorrelation, particularly if the model includes a LDV. One way to test for autocorrelation is to use the Breusch-Godfrey Lagrange multiplier test. This tests the null hypothesis that the residuals are explained by their lagged values. If the errors are serially correlated, then it is necessary to introduce a correction (typically an AR1) for this problem, which we discuss below. Third, if the researcher is considering using a REM or a FEM specification, then it is necessary to test for whether there is actually country-specific heterogeneity in the data. The Breusch-Pagan

Lagrange multiplier test tests the null hypothesis that there is no country-specific heterogeneity. If there is country-specific heterogeneity, then a REM or FEM should be used.

Fourth, if a REM or FEM is called for, then it is necessary to test for the assumption that the RE estimator is uncorrelated with the independent variables. The Hausman test tests the null hypothesis that that the RE estimator is consistent. If the independent variables are correlated with the country-specific effect, the RE estimator is not consistent, and the FE estimator should be used. However, if the independent variables are not correlated with the country-specific effect, then the RE estimator should be used because it is consistent and efficient, while the FE estimator is consistent but not efficient.

The Analysis

We employed the sequence outlined above on our data and concluded that a REM with an AR1 correction was the most appropriate analytic path.[14] The Fisher and Dickey-Fuller tests both indicated that our dependent variable is a stationary time series process. The Breusch-Godfrey Lagrange multiplier test indicated that the residuals were autocorrelated, suggesting the need for a corrective (AR1) procedure. The Breusch-Pagan Lagrange multiplier test indicated that country-specific heterogeneity is present in the data, suggesting the need to use a REM or FEM technique. The Hausman test selected the REM over the FEM.[15]

The resulting REM-AR1 models the dynamic process within the error term:

$$y_{it} = \alpha + \beta' x_{it} + u_i + \varepsilon_{it}, \quad \varepsilon_{it} = \rho\varepsilon_{it} + v_{it}$$

where α is the grand, overall mean and u_i is the country-specific deviation from the overall mean (i.e., the country-specific effect). Within the error term, ρ is the first-order autocorrelation parameter that captures the dependence, or correlation, between errors at time *t* and a prior time point and v_{it} is random error (i.e., white noise) within the error term. We include a LDV in order to model a dynamic process while accounting for unobserved heterogeneity.[16]

An alternative to the REM-AR1 model is the Arellano-Bond GMM estimator (Arellano and Bond 1991). The Arellano-Bond GMM estimator is an extension of the dynamic panel model:

$$y_{it} = \alpha + \beta_1' y_{it-1} + \beta_2' x_{it-1} + u_i + \varepsilon_{it}$$

where α is the grand, overall mean, u_i is the country-specific deviation from the overall mean (i.e., the country-specific effect), y_{it} are lagged values of the dependent variable, x_{it-1} are lagged values of the independent variables and ε_{it} are the residuals. The Arellano-Bond estimator uses a first-difference transformation to account for country-specific effects. The first-difference transformation removes the country-specific effects (u_i) and makes the model a change model:

$$\Delta y_{it} = \Delta\alpha + \beta_1 \Delta y_{it-1} + \beta_2 \Delta x_{it-1} + \Delta\varepsilon_{it}$$

Including the LDV on the right-hand-side of the equation, however, will bias estimates if OLS is used because the errors will be autocorrelated over time. The Arellano-Bond estimator corrects for this by using all available lagged values of the LDV as instruments for the LDV in the first-differenced model.

While this technique permits the estimation of a dynamic process using a lagged dependent variable, a limitation is that the model estimates only within-country, over-time (i.e., historical) variation in the data, because all variation between countries (i.e., cross-national variation) is removed from the model in the first-difference transformation. For this reason, we present results from the Arellano-Bond GMM estimator along with results from a traditional pooled OLS panel model and a REM without an AR1 correction. We present results from multiple estimation techniques, both to substantiate the robustness of our findings and to illustrate the evolution of techniques used to model dynamic processes in macro-comparative sociology.

RESULTS

There are three central findings from our analysis. First, foreign direct investment has a significant impact on emigration; one which differs across sectors of the host economy. We find

that FDI in the primary sector accelerates net emigration over a ten-year period, while FDI in the secondary sector retards these outflows. Second, economic development has a nonlinear effect on emigration: emigration levels rise and then fall as levels of economic development increase. Third, international migration has a strong internal momentum once it has been initiated, as past levels of emigration have a strong impact on future emigration levels. The complete results are given in Table 1.

Insert Table 1 Here

A series of four models are presented that progress from an intranational analysis of net emigration levels to a full model that includes both intranational and global-level factors. Model 1 includes variables used in an intra-national analysis of international emigration levels in LDCs: population age composition, gross domestic investment, aggregate level of human capital, gross domestic investment and gross domestic product per capita. In this model, the lagged dependent variable has a significant effect on levels of net emigration. We find that previous levels of emigration are associated with higher levels of emigration ten years later, which is consistent with the theory of cumulative causation, or the network effect of migration. None of the other exogenous variables have a significant impact on net emigration.

In Model 2, we test the migration transition hypothesis by adding a quadratic term for GDP per capita in addition to the other intra-national variables. Both the GDP per capita and the quadratic GDP per capita terms are significant, in opposite directions. As GDP per capita levels rise, emigration levels also increase. However, at higher levels of GDP per capita, we find that emigration levels decrease. This finding is consistent with the migration transition hypothesis. The effect of prior levels of emigration, as captured by the lagged dependent variable, remains significant in this model, but no other intra-national variables are found to have an effect on the net emigration level.

In Model 3, we begin assessing the impact of globalization on net emigration levels by including FDI stocks in the primary and secondary sectors of the domestic economy. Only FDI

stocks in the primary and secondary sectors are included due to the high correlation between FDI stocks in the secondary and tertiary sectors, which resulted in unacceptably high VIFs.[17] These results demonstrate that FDI has a significant and differential effect on net emigration levels. We find that FDI stocks in the primary sector have a significant positive effect on net emigration over a ten-year period. FDI stocks in the secondary sector, however, have a significant negative effect on emigration over a ten-year period. As in the previous models, the lagged dependent variable and the migration transition have significant effects on net emigration levels.

In Model 4, we add exports per GDP to test for the effect of a second component of globalization – international trade. The level of exports has no effect on the level of emigration. FDI stocks again have countervailing effects on net emigration levels. FDI stocks in the primary sector have a positive effect on the level of emigration, but FDI stocks in the secondary sector have a negative effect. The prior emigration level and the migration transition remain significant in this model, but no other intra-national variables are found to have an effect on the net emigration level.

In order to test the robustness of the findings to the estimation technique, Table 2 presents results from three different estimation techniques that are used to model dynamic relationships in macro-comparative sociology: OLS-Dynamic model, GLS-REM, and an Arellano-Bond GMM model. The findings from the REM-AR1 model are replicated. We find a non-linear effect of GDP per capita, a positive effect of prior levels of emigration, a positive effect of FDI-primary sector, and a negative effect of FDI-secondary sector.

DISCUSSION

This study assessed the influence of globalization and economic development on emigration from less developed countries. Three findings stand out. Most notable is that stocks of foreign direct investment have significant, differential effects on the movements of peoples across national borders. FDI in the primary sector has a positive effect on the level of net emigration at ten-year intervals between 1970 and 2000, while FDI in the secondary sector has a

negative effect. These findings are net of all controls and robust across four different estimation techniques. Second, we find support for the migration transition hypothesis; the concept that emigration levels rise and then decrease as GDP per capita levels increase. Finally, the analysis demonstrates the cumulative causation of migration, as emigration levels are strongly influenced by the size of previous levels of emigration.

Broadly considered, our analyses suggest the need for a more nuanced understanding of the relationship between globalization, development, and migration than current theorizations suggest. Emigration levels are a product of several countervailing effects at the national and global levels. First, we find that economic development entails rising emigration rates up to a certain point and decreasing emigration rates thereafter. Using coefficients from the models in Table 1, we calculate that this inflection point occurs approximately at a per capita GDP of $2,500.[18] This means that emigration rates should continue to increase up to per capita income levels of $2,500, and then begin to decrease.

To our knowledge, the inflection point for the migration transition has not been empirically demonstrated previously in a cross-national analysis of LDCs. However, stylized depictions show that the complete transition from net emigration to net immigration occurs at approximately $4,000-4,500 (Fisher and Straubhaar 1996; Stalker 2000). Our finding is consistent with these previous descriptions. If net emigration rates begin to decrease around per capita income levels of $2,500, then it is reasonable to expect that the complete transition from net emigration to net immigration is likely to occur in the $4,000-$5,000 range.

Our findings on the impact of economic development provide reason for both optimism and discouragement. The good news is that economic development does seem to have the potential for lowering emigration rates from LDCs. The bad news is that the threshold for decreasing emigration rates seems to be relatively high. Approximately 70% of all LDCs have not yet reached the point at which emigration levels should begin to decrease ($2,500) and further, over 80% have not reached the point at which countries are expected to transition from

net emigration to net immigration ($4,000). At the mean per capita income level for our sample ($1,700), annual growth rates of 3% would be required for over a decade (approximately 13 years) to reach a point at which emigration would slow. Moreover, this growth rate would have to be sustained for another 15 years (a total of approximately 30 years) in order to generate a transition from net emigration to net immigration.

Thus, the effects of development on migration involve generational-type changes, even with the relatively optimistic assumption of 3% annual growth in this example. If countries cannot maintain this rate of growth, the transition process will be prolonged. There is good reason, then, for a more restrained attitude toward the idea of development as a panacea for reducing emigration from LDCs. Nevertheless, our results suggest that the migration transition warrants continued attention from researchers. Specifically, future research that examines the impact of economic development on migration rates across a wider spectrum of countries, including developed countries, could provide additional insights into these thresholds.

Although economic development is the focus of much of the previous literature on international migration, our analysis reveals that FDI and cumulative causation are also important explanations. These findings provide additional insights into the countervailing forces driving emigration rates. FDI is one example. On the one hand, FDI in the primary sector generates a push effect that is consistent with political economy theory, which posits that FDI has disruptive and mobilizing effects on host social structures that make emigration more likely (Portes and Walton 1981; Sassen 1988). On the other hand, FDI in the secondary sector seems to counteract the push effect produced by FDI in the secondary sector. This effect is supported by neoclassical economic theory, which contends that FDI generates a host of effects that reduce the rate of emigration abroad (Sauvant, Mallampally, and Economou 1993).

The standardized coefficients show that the effects of FDI are weaker than the effect of economic development, but are equally strong in each sector. This suggests that the prior emphasis on development is warranted, but also that this emphasis is necessarily incomplete in

that it neglects the impact of FDI. Including FDI in explanations of migration complicates a straightforward interpretation of the impact of development on migration. For example, our findings show that at any given level of economic development, FDI exerts a unique and independent effect on net emigration rates. Although our analysis leaves open the question of how FDI is related to development and migration, our findings suggest that this would be a very worthwhile area for future research. Similarly, the opposing effects of FDI across economic sectors are also worthy of future inquiries, as contemporary theories posit similar effects across sectors.

Our finding of a strong cumulative causation effect of migration further complicates our understanding of the development-migration relationship. The analysis indicates that there is a strong internal momentum to international migration such that it is likely to continue once it has been initiated. The theory of cumulative causation has been supported empirically for migration in specific countries, particularly Mexican migration (Massey 1987). However, this effect has not been empirically demonstrated to hold across countries. The standardized coefficients indicate that the effect of cumulative causation is larger in size than the effects of FDI and approximately equal in size to the effect of economic development. Further, as is the case with FDI, the cumulative causation effect is independent of economic development levels.

When considered together, these findings complicate our understanding of how globalization and development influence international migration in LDCs. Our findings suggest the need to refine and further integrate alternative theoretical frameworks. The relationship between migration and development is much more nuanced and complex than any one particular theory suggests. Our analysis demonstrates that simple applications of concepts from a single theoretical framework to an empirical model are likely to exclude important factors that influence migration flows. Yet the two most commonly-used theoretical frameworks – neoclassical economics and political-economy – remain relatively distinct fields of inquiry. There are very

few attempts to integrate theoretical explanations across these areas (see Massey et al. 2005 for a notable exception).

Fewer still are empirical studies that specify concepts from multiple theories in a single model, as we have done. Incorporating explanations from multiple theories will ultimately produce better specified models that can provide additional insights into the structural determinants of migration. Our analysis supports further integration of these theoretical frameworks.

There are certainly limitations to our analysis. The first problem concerns the small sample size in the analysis, which limits the number of independent variables in the model. Second, cross-national data often contain significant amounts of measurement error, and measurement error can increase the size of the standard errors of the coefficients in regression analysis, leading to attenuated coefficients (Wooldridge 2006: p. 326). If this is the case with the significant coefficients in our analysis, however, then the estimates provided here are more conservative estimates. Third, the analysis focuses explicitly on migration-sending, or origin, countries. Future structural analyses that incorporate factors that 'pull' migrants from origin countries would allow tests of the relative importance of structural 'push' and 'pull' factors in producing emigration.

Our analysis also provides several other paths for future research on the relationship between migration and development. Subsequent studies that attempt to elaborate upon the causal mechanisms linking FDI with migration are particularly needed. There is very little research at a sub-national level that tests the theoretical explanations of how FDI impacts migration patterns. Country-specific historical case studies could provide additional insights into the viability of our findings in particular places at particular time points. We note, however, that it will be important to conduct such studies with the larger global context in mind, and to link country-specific mechanisms and contexts with the global, macrostructural context (cf. Portes 1997).

Similarly, our findings of a nonlinear effect of development with opposing effects of sectoral FDI suggest a theoretical opportunity for future research. Specifically, the effect of FDI on migration found here may reflect the relative balance of a country's FDI inflows and outflows, on an "investment-development path" (Alderson and Nielsen 1999). In this respect, dependence on FDI, and therefore the positive effect of FDI on emigration, may diminish as countries attain higher levels of economic development, and transition from being net capital importers to net capital exporters. Our examination of the causal structural mechanisms linking FDI with migration precluded a specific investigation of the investment-development path model. However, this would also be a worthwhile area for future research.

ENDNOTES

1 While the breadth and depth of international migration in the late-20th and early 21st centuries is in many ways unprecedented, human mobility across large distances of time and space is certainly not limited to the present epoch (Hoerder 2002), and large-scale migrations were particularly common during the period of industrialization in Europe in the 19th and early-20th centuries (cf. Hatton and Williamson 2006).

2 We consider 'structural' explanations to exist extra-individually and objectively. We follow Massey et al. (1993) in distinguishing between levels of analysis when investigating migration.

3 Economic activity in the primary sector involves the transformation of natural resources into primary products. The output from the primary sector is usually used as raw materials for other industries. Industries in the primary sector include: agriculture, mining, farming, and fishing. Economic activity in the secondary sector involves the transformation of raw materials into finished goods. Industries in the secondary sector include manufacturing and construction.

4 As a standard procedure in multivariate regression analysis, we logarithmically (log) transform variables in this analysis if they violate one or more of the underlying assumptions of regression analysis. See Chatterjee, Hadi, and Price (2000: Chapter 6) or Fox (1991: 46) for a more detailed discussion of variable transformations in regression analysis.

5 In subsequent analyses (results not shown), we controlled for the short-term annual flow of FDI. This variable was transformed (ln) to correct for a skewed distribution. Because the annual flow can be negative, it was necessary to add a constant (1) to each value before transforming the data. The results were not substantively different from those reported here.

6 As we discuss in the literature review, the macroeconomic literature suggests that international discrepancies in incomes is also an impetus for international migration (Borjas 1989). Thus, we also estimated models that included a proxy measure of the average difference in per capita incomes between developed and less-developed countries (results not shown here). The substantive findings reported here were unchanged.

7 We also estimated models that controlled for the spatial distribution of the population (i.e., the percentage of the population living in urban areas), the population growth rate, and the size of the total population (results available upon request). The substantive findings reported here were unchanged.

8 We also estimated models that included alternative specifications for the effect of population age composition. We disaggregated the percentage of the population in the 10-19 age category by gender and included measures for males in the 10-19 age category as a percentage the population, and females in the 10-19 age category as a percentage of the population. The results were not substantively different from those we report here. We also estimated the effects of the gender-disaggregated variables by specifying a 10-year lagged effect on net emigration per capita (e.g. measures of males or females in the 20-29 age category as a percentage of the total population). The results were not substantively different from those we report here.

9 The gross secondary enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education.

10 Following Marshall et al's (2006) recommendations, we use the 'POLITY2' variable, which transforms Polity standardized authority codes (i.e., -66, -77, and -88) to scaled polity scores "so that the polity scores can be used consistently in time series analyses without losing crucial information by treating the "standardized authority scores" as missing values."

11 In subsequent analyses (results not shown), we operationalized the time trend as a set of dummy variables for each of the ten-year periods, or waves, examined in the analyses (1970, 1975, 1980, 1985, 1990). The results were substantively similar to those reported here.

12 Heterogeneity bias is bias that is introduced into the regression estimate caused from omitting a time-constant variable from the regression analysis. When an important unobserved time-constant variable is left out of the regression model, the regression coefficient estimates may not, on average, approximate the coefficient population parameters. Ordinary least squares regression analysis cannot correct for the problem of heterogeneity bias, but random and fixed effects models can address this issue. See Berry and Feldman (1985) for a more detailed discussion of estimate bias in regression analysis and Wooldridge (2006: 462) for a more detailed discussion of heterogeneity bias in panel data analysis.

13 Residual autocorrelation occurs when the errors for observations are correlated with one another. This is frequently a problem for time-series research because the error for a country's observation at one time period is likely to be associated with an error for the country's observation at a subsequent time point. Residual autocorrelation can lead to biased estimates of standard errors when using OLS. See Chatterjee, Hadi, and Price (2000: 201) for more information.

14 We also inspected bivariate plots for the presence of outliers. No influential cases were detected. A bivariate plot graphically shows the relationship between two variables. Bivariate plots are commonly used to determine whether the assumptions of the regression analysis have been violated. Outlying, or extreme, observations are problematic for regression analysis because they can exert excessive influence on the results of the analysis. See Fox (1991: 21) and Chatterjee, Hadi, and Price (2000: Chapter 4) for a more detailed discussion of how bivariate plots are used to identify influential observations.

15 We ran the standard Hausman specification test and the Hausman specification test with the Swamy-Arora correction. Both tests selected the REM. It is necessary to use the Swamy-Arora (1972) correction of the Hausman test to estimate variance components for the Hausman test in small samples with unbalanced data structures (cf. Stata 2005: pp. 263-264). Estimating variance components with or without taking into account the size of the sample produces consistent, or unbiased, estimates (Stata 2005: p. 263), but the Swamy-Arora method produces a "more precise small-sample adjustment" in the context of an unbalanced panel data structure (Stata 2005: p. 264).

16 Because there remains contention over whether it is appropriate to use a LDV in a REM-AR1, we also estimated REM-AR1 models without a LDV (results not shown). The results were substantively similar to those reported here.

17 Regression analysis assumes that the independent variables are not highly correlated with one another. multicollinearity occurs when the independent variables in the regression analysis are highly correlated with one another. Multicollinearity makes it difficult to interpret the unique effect of a particular independent variable in the regression analysis, and it can affect the coefficient estimates and standard errors of the coefficients. Variance inflation factors (VIFs) assess the relationships among the independent variables, and are commonly used to assess the problem of multicollinearity in regression analysis. See Chatterjee, Hadi, and Price (2000: Chapter 9) for a more detailed discussion of multicollinearity and VIFs.

18 The inflection point of a quadratic, or nonlinear, function is calculated as (a/-2b), where *a* is the coefficient of the first term in the function and *b* is the coefficient of the squared term.

APPENDIX A: Zero-Order Correlations and Basic Descriptive Statistics (n=59)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(a) Net Emigration per capita (ln)	1.00											
(b) Pct. Population Aged 10-19	0.10	1.00										
(c) Gross Domestic Investment	-0.18	0.25	1.00									
(d) Secondary Education	0.23	0.53	0.31	1.00								
(e) Democratic Development	-0.08	0.22	-0.07	0.13	1.00							
(f) GDP per capita	0.34	0.44	0.14	0.57	0.05	1.00						
(g) GDP per capita-squared	0.02	0.38	0.23	0.48	0.05	0.79	1.00					
(h) Net Emigration per capita (t-10) (ln)	0.78	0.30	-0.21	0.32	0.08	0.37	0.10	1.00				
(i) FDI-Primary (ln)	0.05	-0.10	-0.23	-0.18	0.01	-0.17	-0.13	-0.09	1.00			
(j) FDI-Secondary (ln)	-0.15	0.16	0.22	0.18	0.12	0.22	0.19	-0.09	0.31	1.00		
(k) Exports	0.15	0.34	0.16	0.28	-0.02	0.11	0.09	0.28	0.33	0.22	1.00	
(l) Year	0.03	0.65	0.06	0.45	0.29	0.22	0.21	0.14	0.02	0.13	0.22	1.00
Mean	-5.27	0.19	21.67	41.25	1.05	0	2510298	-5.41	-5.06	-4.20	20.99	1981.86
S.D.	1.31	0.01	6.31	20.49	6.77	1598	4366753	1.59	2.07	1.37	10.23	6.22

APPENDIX B: Zero-Order Correlations and Basic Descriptive Statistics (n=37)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(a) Net Emigration per capita (ln)	1.00											
(b) Pct. Population Aged 10-19	0.00	1.00										
(c) Gross Domestic Investment	-0.23	0.37	1.00									
(d) Secondary Education	0.26	0.44	0.24	1.00								
(e) Democratic Development	0.00	0.05	-0.02	0.09	1.00							
(f) GDP per capita	0.22	0.48	0.20	0.57	0.05	1.00						
(g) GDP per capita-squared	0.12	0.46	0.25	0.56	0.01	0.78	1.00					
(h) FDI-Primary (ln)	0.14	-0.13	-0.19	-0.18	-0.02	-0.28	-0.32	1.00				
(i) FDI-Secondary (ln)	-0.24	0.26	0.23	0.21	0.08	0.24	0.24	0.41	1.00			
(j) Exports	0.05	0.27	0.14	0.21	-0.08	0.08	0.09	0.44	0.25	1.00		
(k) Net Emigration per capita (t-10) (ln)	0.77	0.22	-0.27	0.32	0.00	0.28	0.22	0.10	-0.19	0.22	1.00	
(l) Year	-0.13	0.32	0.00	0.27	0.23	0.15	0.19	0.02	0.17	0.12	0.03	1.00
Mean	-5.25	0.19	22.09	46.36	2.14	0	2151093	-4.96	-4.16	21.51	-5.40	1985.27
S.D.	1.23	0.01	6.75	19.34	2.56	1686	4327352	2.08	1.44	10.22	1.50	3.90

APPENDIX C: COUNTRIES INCLUDED IN CROSS-NATIONAL ANALYSES

OLS and GLS Models (n=59)		GMM Model (n=37)	
Bangladesh	1980-1990		
Bangladesh	1985-1995	Bangladesh	1985-1995
Bolivia	1980-1990		
Bolivia	1985-1995	Bolivia	1985-1995
Bolivia	1990-2000	Bolivia	1990-2000
Brazil	1985-1995	Brazil	1985-1995
Brazil	1990-2000	Brazil	1990-2000
Chile	1975-1985		
Chile	1980-1990	Chile	1980-1990
Colombia	1970-1980		
Colombia	1975-1985		
Colombia	1980-1990	Colombia	1980-1990
Colombia	1985-1995	Colombia	1985-1995
Colombia	1990-2000	Colombia	1990-2000
Dominican Rep	1970-1980		
Dominican Rep	1975-1985		
Dominican Rep	1980-1990	Dominican Rep	1980-1990
Dominican Rep	1985-1995	Dominican Rep	1985-1995
Guatemala	1975-1985		
Guatemala	1980-1990	Guatemala	1980-1990
Guatemala	1985-1995	Guatemala	1985-1995
Indonesia	1970-1980		
Indonesia	1975-1985		
Indonesia	1980-1990	Indonesia	1980-1990
Indonesia	1985-1995	Indonesia	1985-1995
Indonesia	1990-2000	Indonesia	1990-2000
India	1970-1980		
India	1975-1985		
India	1980-1990	India	1980-1990
India	1985-1995	India	1985-1995
India	1990-2000	India	1990-2000
South Korea	1980-1990		
South Korea	1985-1995	South Korea	1985-1995
South Korea	1990-2000	South Korea	1990-2000
Sri Lanka	1980-1990		
Sri Lanka	1985-1995	Sri Lanka	1985-1995
Mexico	1970-1980		
Mexico	1975-1985		
Mexico	1980-1990	Mexico	1980-1990
Mexico	1985-1995	Mexico	1985-1995
Mexico	1990-2000	Mexico	1990-2000
Nigeria	1975-1985		
Nigeria	1985-1995	Nigeria	1985-1995
Nigeria	1990-2000	Nigeria	1990-2000
Peru	1980-1990	Peru	1980-1990

Peru	1985-1995	Peru	1985-1995
Peru	1990-2000	Peru	1990-2000
Philippines	1975-1985		
Philippines	1980-1990	Philippines	1980-1990
Philippines	1985-1995	Philippines	1985-1995
Philippines	1990-2000	Philippines	1990-2000
Papua New Guinea	1975-1985		
Papua New Guinea	1980-1990	Papua New Guinea	1980-1990
El Salvador	1980-1990	El Salvador	1990-2000
El Salvador	1990-2000		
Thailand	1985-1995	Thailand	1985-1995
Thailand	1990-2000	Thailand	1990-2000
Trinidad	1985-1995		
Trinidad	1990-2000	Trinidad	1990-2000

APPENDIX D: COUNTRIES INCLUDED IN CROSS-NATIONAL ANALYSES WITH KEY VARIABLES (n=59)

	Observed Years	Net Emigration per Capita	FDI-Primary Stock per GDP	FDI-Secondary Stock per GDP
Bangladesh	1980-1990	0.0012	0.0015	0.0019
	1985-1995	0.0022	0.0014	0.0027
Bolivia	1980-1990	0.0150	0.1025	0.0226
	1985-1995	0.0134	0.1357	0.0268
	1990-2000	0.0120	0.1182	0.0219
Brazil	1985-1995	0.0011	0.0044	0.0860
	1990-2000	0.0007	0.0028	0.0553
Chile	1975-1985	0.0050	0.0019	0.0022
	1980-1990	0.0030	0.0156	0.0099
Colombia	1970-1980	0.0098	0.0016	0.0378
	1975-1985	0.0085	0.0014	0.0280
	1980-1990	0.0070	0.0017	0.0193
	1985-1995	0.0052	0.0184	0.0277
	1990-2000	0.0047	0.0342	0.0317
Dominican Rep	1970-1980	0.0112	0.0100	0.0040
	1975-1985	0.0124	0.0061	0.0249
	1980-1990	0.0254	0.0030	0.0161
	1985-1995	0.0287	0.0040	0.0232
El Salvador	1980-1990	0.0429	0.0008	0.0228
	1990-2000	0.0061	0.0019	0.0348
Guatemala	1975-1985	0.0315	0.0044	0.0003
	1980-1990	0.0337	0.0021	0.0002
	1985-1995	0.0361	0.0017	0.0001
Indonesia	1970-1980	0.0005	0.0316	0.0086
	1975-1985	0.0004	0.0834	0.0443
	1980-1990	0.0023	0.0927	0.0334
	1985-1995	0.0038	0.2294	0.0493
	1990-2000	0.0044	0.2775	0.0525
India	1970-1980	0.0004	0.0054	0.0095
	1975-1985	0.0004	0.0030	0.0080
	1980-1990	0.0006	0.0006	0.0055
	1985-1995	0.0015	0.0003	0.0041
	1990-2000	0.0014	0.0005	0.0040
South Korea	1980-1990	0.0044	0.0002	0.0132
	1985-1995	0.0026	0.0002	0.0131
	1990-2000	0.0017	0.0002	0.0204
Sri Lanka	1980-1990	0.0018	0.0001	0.0333
	1985-1995	0.0100	0.0078	0.0281
Mexico	1970-1980	0.0126	0.0055	0.0590
	1975-1985	0.0172	0.0022	0.0404
	1980-1990	0.0192	0.0019	0.0293
	1985-1995	0.0197	0.0015	0.0617
	1990-2000	0.0204	0.0022	0.0719
Nigeria	1975-1985	0.0086	0.0427	0.0221

	1985-1995	0.0009	0.0120	0.0315
	1990-2000	0.0008	0.0055	0.0243
Peru	1980-1990	0.0083	0.0190	0.0149
	1985-1995	0.0189	0.0224	0.0209
	1990-2000	0.0135	0.0150	0.0135
Philippines	1975-1985	0.0150	0.0023	0.0113
	1980-1990	0.0133	0.0073	0.0193
	1985-1995	0.0132	0.0129	0.0218
	1990-2000	0.0119	0.0008	0.0015
Papua New Guinea	1975-1985	0.0018	0.2994	0.0387
	1980-1990	0.0018	0.2080	0.0465
Thailand	1985-1995	0.0015	0.0096	0.0163
	1990-2000	0.0014	0.0069	0.0427
Trinidad	1985-1995	0.0191	0.1933	0.0162
	1990-2000	0.0156	0.3298	0.0309

Table 1: Unstandardized Coefficients from GLS Random Effects Regression with First Order Temporal Autocorrelation Correction of Net Emigration per Capita on Sectoral Foreign Direct Investment and Other Independent Variables

	Model 1	Model 2	Model 3	Model 4
Percentage of Population Age 10-19	-5.148 (12.257) [-0.06]	-6.985 (12.084) [-0.08]	-7.115 (11.699) [-0.08]	-6.764 (11.784) [-0.08]
Gross Domestic Investment / GDP	-0.002 (0.018) [-0.01]	0.000 (0.018) [0.00]	0.012 (0.018) [0.06]	0.009 (0.019) [0.04]
Gross Secondary Enrollment Rate	-0.001 (0.010) [-0.02]	-0.002 (0.010) [-0.03]	-0.001 (0.010) [-0.01]	-0.001 (0.010) [-0.01]
Domestic Political Structure	-0.026 (0.021) [-.13]	-0.018 (0.021) [-0.09]	-0.019 (0.021) [-0.10]	-0.018 (0.021) [-0.09]
Gross Domestic Product per capita	0.0001 (0.0001) [0.17]	0.0004* (0.0002) [0.45]	0.0004* (0.0002) [0.54]	0.0004* (0.0002) [0.53]
Gross Domestic Product per capita (squared)		-7.68E-08* (4.54E-08) [-0.26]	-8.80E-08* (4.43E-08) [-0.29]	-8.43E-08* (4.49E-08) [-0.28]
Primary Sector FDI Stock / GDP (ln)			0.147* (0.074) [0.23]	0.143* (0.075) [0.23]
Secondary Sector FDI Stock / GDP (ln)			-0.232* (0.112) [-0.24]	-0.242* (0.114) [-0.25]
Exports / GDP (ln)				0.008 (0.012) [0.06]
Net Emigration per capita (10-year lag) (ln)	0.428*** (0.107) [0.52]	0.401*** (0.106) [0.48]	0.381*** (0.104) [0.46]	0.374*** (0.105) [0.45]
Year	-0.002 (0.026)	0.000 (0.026)	0.001 (0.025)	-0.001 (0.025)

	[-0.01]	[0.00]	[0.01]	[-0.01]
Constant	2.855 (50.467)	-1.198 (49.623)	-4.387 (48.043)	0.204 (48.854)
R^2	0.63	0.65	0.69	0.67
Number of Observations	59	59	59	59
Number of Countries	19	19	19	19

Notes: Standard errors are in parentheses and standardized coefficients are in brackets.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

Table 2: Unstandardized Coefficients from Regressions of Net Emigration per capita

	Model 1	Model 2	Model 3
	OLS-Dynamic	GLS-Random Effects	ARELLANO-BOND GMM
Percentage of Population Age 10-19	-15.731 (10.641) [-0.18]	-10.639 (11.942) [-0.12]	-15.967 (20.877) [-0.16]
Gross Domestic Investment / GDP	0.024 (0.020) [0.12]	0.030 (0.020) [0.14]	-0.018 (0.031) [-0.10]
Gross Secondary Enrollment Rate	0.003 (0.007) [0.05]	0.001 (0.009) [0.02]	0.021 (0.027) [0.33]
Domestic Political Structure	-0.020 (0.016) [-0.10]	-0.018 (0.020) [-0.09]	-0.014 (0.025) [-0.07]
Gross Domestic Product per capita	0.0002** (0.00009) [0.24]	0.0002* (0.0001) [0.24]	0.0001 (0.0007) [0.14]
Gross Domestic Product per capita (squared)	-9.29e-08** (4.43e-08) [-0.31]	-9.43e-08* (4.46e-08) [-0.31]	-3.32e-08 (1.28e-07) [-0.09]
Primary Sector FDI Stock / GDP (ln)	0.160** (0.061) [0.25]	0.139* (0.070) [0.22]	0.286* (0.138) [0.48]
Secondary Sector FDI Stock / GDP (ln)	-0.164* (0.086) [-0.17]	-0.186* (0.110) [-0.19]	-0.431* (0.253) [-0.50]
Exports / GDP (ln)	-0.015 (0.012) [-0.12]	-0.005 (0.013) [-0.04]	0.011 (0.018) [0.09]
Net Emigration per capita (10-year lag) (ln)	0.623*** (0.083) [0.75]	0.526*** (0.102) [0.64]	0.435* (0.218) [0.53]
Year	0.012 (0.023)	0.010 (0.024)	0.017 (0.033)

	[0.06]	[0.05]	[0.05]
Constant	-22.101 (44.233)	-19.872 (46.462)	
R^2	0.67	0.72	
Number of Observations	59	59	37
Number of Countries	19	19	19

Notes: Standard errors are in parentheses and standardized coefficients are in brackets.

*p<.05 **p<.01 ***p<.001 (one-tailed tests)

REFERENCES

Ackerman, Sune. 1976a. "Theories and Methods of Migration Research." Pp. 19-75 in *From Sweden to America: A History of Migration*, edited by H. Runblom and H. Norman. Minneapolis, MN: University of Minnesota Press.

—. 1976b. "Theories and Methods of Migration Research." Pp. 19-75 in *From Sweden to America: A History of Migration*, edited by H. Runblom and H. Norman. Minneapolis, MN: University of Minnesota Press.

Akabzaa, Thomas. 2000. *Boom and Dislocation: The Environmental and Social Impacts of Mining in the Wassa West District of Ghana*. Accra, Ghana: Third World Network.

Alderson, Arthur S. and Francois Nielsen. 1999. "Income Inequality, Development, and Dependence: A Reconsideration." *American Sociological Review* 64:606-631.

Anderson, Anthony B. 1990. "Smokestacks in the Rainforest: Industrial Development and Deforestation in the Amazon Basin." *World Development* 18:1191-1205.

Annan, Kofi. 2006. "Address of Mr. Kofi Annan, Secretary-General, to the High-Level Dialogue of the United Nations General Assembly on International Migration and Development." *International Migration Review* 40:963-965.

Appleyard, Reginald. 1992. "International Migration and Development - An Unresolved Relationship." *International Migration* 30:251-266.

Arellano, Manuel and Steven Bond. 1991. "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations." *The Review of Economic Studies* 58:277-297.

Beckfield, Jason. 2006. "European Integration and Income Inequality." *American Sociological Review* 71:964-985.

Berry, Wililam D. and Stanley Feldman. 1985. *Multiple Regression in Practice*. Thousand Oaks, CA: Sage.

Bilsborrow, Richard E. 2002. "Migration, Population Change, and the Rural Environment." *Environmental Change and Security Project Report* 8:69-84.

Birdsall, Nancy, Allen C. Kelley, and Steven W. Sinding. 2001. *Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World*. Oxford: Oxford University Press.

Borjas, George J. 1989. "Economic Theory and International Migration." *International Migration Review* 23:457-485.

Bornschier, Volker and Christopher Chase-Dunn. 1985. *Transnational Corporations and Underdevelopment*. New York: Praeger.

Browder, John O. and Brian J. Godfrey. 1997. *Rainforest Cities: Urbanization, Development, and Globalization of the Brazilian Amazon*. New York, NY: Columbia University Press.

Bunker, Stephen G. 1984. "Modes of Extraction, Unequal Exchange, and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon, 1600-1980." *American Journal of Sociology* 89:1017-1064.

—. 1985. *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. Chicago, IL: University of Chicago Press.

Castles, Stephen and Mark J. Miller. 2003. *The Age of Migration, Third Edition*. New York: The Guilford Press.

Chase-Dunn, Christopher. 1975. "The Effects of International Economic Dependence on Development and Inequality: A Cross-National Study." *American Sociological Review* 40:720-738.
—. 1998. *Global Formation: Structures of the World-Economy*. New York: Rowman and Littlefield.
Chase-Dunn, Christopher, Yukio Kawano, and Benjamin D. Brewer. 2000. "Trade Globalization Since 1795: Waves of Integration in the World-System." *American Sociological Review* 65:77-95.
Chatterjee, Samprit, Ali S. Hadi, and Bertram Price. 2000. *Regression Analysis By Example, Third Edition*. New York, NY: John Wiley and Sons.
Ciccantell, Paul S. 1999. "Making Aluminum in the Rainforest." *Journal of Developing Areas* 33:175-198.
Csimced. 1990. "Unauthorized Migration: An Economic Development Response." Washington, D.C.: Report of the Commission for the Study of International Migration and Cooperative Economic Development.
Daly, Herman E. 2006. "Population, migration, and globalization." *Ecological Economics* 59:187-190.
Dicken, Peter. 2003. *Global Shift: Reshaping the Global Economic Map in the 21st Century, Fourth Edition*. New York, NY: Guilford Press.
Dixon, William J. and Terry Boswell. 1996. "Dependency, Disarticulation, and Denominator Effects: Another Look at Foreign Capital Penetration." *American Journal of Sociology* 102:543-562.
Ehrenreich, Barbara and Arlie Russell Hochschild. 2004. *Global Woman: Nannies, Maids, and Sex Workers in the New Economy*. New York, NY: Metropolitan Books.
Fernandez-Kelly, Maria Patricia. 1983. *For We are Sold, I and My People: Women and Industry in Mexico's Frontier*. Albany, NY: State University of New York Press.
Firebaugh, Glenn. 1992. "Growth Effects of Foreign and Domestic Investment." *American Journal of Sociology* 98:105-130.
Fox, John. 1991. *Regression Diagnostics*. Thousand Oaks, CA: Sage.
Freeman, Gary P. 1995. "Modes of Immigration Policies in Liberal Democratic States." *International Migration Review* 29:881-902.
Ghosh, Bimal. 1992. "Migration-Development Linkages: Some Specific Issues and Practical Policy Measures." *International Migration* 30:423-456.
Gilpin, Robert. 1975. *U.S. Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment*. New York, NY: Basic Books.
—. 2001. *Global Political Economy: Understanding the International Economic Order*. Princeton, NJ: Princeton University Press.
Glick Schiller, Nina, Linda Basch, and Cristina Szanton Black. 1995. "From Immigrant to Transmigrant: Theorizing Transnational Migration." *Anthropological Quarterly* 68:48-63.
Godfrey, Brian J. 1990. "Boom Towns of the Amazon." *Geographical Review* 80:103-117.
Gonzalez, Patricio Aroca and William F. Maloney. 2005. "Migration, Trade and Foreign Direct Investment in Mexico." *World Bank Economic Review* 19:449-472.

Hatton, Timothy J. and Jeffrey G. Williamson. 1994. "What Drove Mass Immigrations from Europe in the Late Nineteenth Century?" *Population and Development Review* 20:533-560.
—. 1998. *The Age of Mass Migration: Causes and Economic Impacts*. New York, NY: Oxford University Press.
—. 2006. *Global Migration and the World Economy: Two Centuries of Policy and Performance*. Cambridge, MA: MIT Press.
Held, David, Anthony McGrew, David Goldblatt, and Jonathan Perraton. 1999. *Global Transformations: Politics, Economics, and Culture*. Stanford, CA: Stanford University Press.
Hirschman, Albert. 1977. "A Generalized Linkage Approach to Development, with Special Reference to Staples." Pp. 67-98 in *Essays on Economic Development in Honor of B.F. Hoselitz*, edited by M. Nash. Chicago, IL: University of Chicago Press.
Hite, Amy Bellone. 2004. "Natural Resource Growth Poles and Frontier Urbanization in Latin America." *Studies in Comparative International Development* 39:50-75.
Hoerder, Dirk. 2002. *Cultures in Contact: World Migrations in the Second Millennium*. Durham, NC: Duke University Press.
Hollifield, James F. 2004. "The Emerging Migration State." *International Migration Review* 38:885-912.
Huber, Evelyne , Francois Nielsen, Jenny Pribble, and John D. Stephens. 2006. "Politics and Inequality in Latin America and the Caribbean." *American Sociological Review* 71:943-963.
Jenkins, J. Craig and Stephen J. Scanlan. 2001. "Food Security in Less Developed Countries, 1970 to 1990." *American Sociological Review* 66:718-744.
Keele, Luke and Nathan J. Kelly. 2006. "Dynamic models for dynamic theories: The ins and outs of lagged dependent variables." *Political Analysis* 14:186-205.
Kentor, Jeffrey. 1998. "The Long Term Effects of Foreign Investment Dependence on Economic Growth, 1940-1990." *American Journal of Sociology* 103:1024-1048.
Kirk, Dudley. 1996. "Demographic Transition Theory." *Population Studies* 50:361-387.
Lee, Cheol-Sung. 2005. "Income Inequality, Democracy, and Public Sector Size." *American Sociological Review* 70:158-181.
Levy, Mildred B. and Walter J. Wadycki. 1973. "The Influence of Family and Friends on Geographic Labor Mobility: An Intercensal Comparison." *Review of Economics and Statistics* 55:198-203.
London, Bruce. 1988. "Dependence, Distorted Development, and Fertility Trends in Noncore Nations: A Structural Analysis of Cross-National Data." *American Sociological Review* 53:606-618.
Marshall, Monty G., Keith Jaggers, and Ted Robert Gurr. 2006. "Polity IV Project: Political Regime Characteristics and Transitions, 1800 - 2004." Center for International Development and Conflict Management, University of Maryland.
Martin, Philip and J. Edward Taylor. 1996. "The Anatomy of a Migration Hump." Pp. 43-62 in *Development Strategy, Employment, and Migration: Insights from Models*, edited by J. E. Taylor. Paris: Organization for Economic Cooperation and Development.

Massey, Douglas S. 1987. *Return to Aztlan: The Social Processes of International Migration from Western Mexico*. Berkeley, CA: University of California Press.
—. 1988. "Economic Development and International Migration in Comparative Perspective." *Population and Development Review* 14:383-413.
—. 1990. "Social Structure, Household Strategies, and the Cumulative Causation of Migration." *Population Index* 56:3-26.
—. 1999a. "International Migration at the Dawn of the Twenty-First Century: The Role of the State." *Population and Development Review* 25:303-322.
—. 1999b. "Why Does Immigration Occur? A Theoretical Synthesis." Pp. 34-52 in *The Handbook of International Migration: The American Experience*, edited by C. Hirschman, P. Kasinitz, and J. DeWind. New York, NY: Russell Sage Foundation.
Massey, Douglas S., Joaquin Arango, Graeme Hugo, Ali Kouaouchi, Adela Pellegrino, and J. Edward Taylor. 1993. "Theories of International Migration: A Review and Appraisal." *Population and Development Review* 19:431-466.
—. 2005. *Worlds in Motion: Understanding International Migration at the End of the Millennium*. Oxford: Clarendon Press.
Massey, Douglas S., Jorge Durand, and Nolan Malone. 2002. *Beyond Smoke and Mirrors: Mexican Immigration in an Era of Economic Integration*. New York, NY: Russell Sage Foundation.
Massey, Douglas S. and Kristen E. Espinosa. 1997. "What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis." *The American Journal of Sociology* 102:939-999.
Meyers, Eytan. 2000. "Theories of International Migration Policy: A Comparative Analysis." *International Migration Review* 34:1245-1282.
Muradian, Roldan, Joan Martinez-Alier, and Humberto Correa. 2003. "International Capital Versus Local Population: The Environmental Conflict of the Tambogrande Mining Project, Peru." *Society and Natural Resources* 16:775.
Myrdal, Gunnar. 1957. *Rich Lands and Poor*. New York: Harper and Row.
OECD. 2001. *International Direct Investment Statistics Yearbook, 1980-2000*. Paris: OECD Publications.
—. 2004. "Trends in International Migration." Paris.
Papademetriou, Demetrios G. 1989. "Uncertain Connection: Labor Migration and Development." Washington, D.C.: Working Papers, Commission for the Study of International Migration and Co-operative Development, No. 9.
Papademetriou, Demetrios G. and Philip L. Martin. 1991. "The Unsettled Relationship: Labor Migration and Economic Development." Westport, CT: Greenwood Press.
Portes, Alejandro. 1997. "Immigration Theory for a New Century: Some Problems and Opportunities." *International Migration Review* 31:799-825.
Portes, Alejandro, Luis E. Guarnizo, and Patricia Landolt. 1999. "The Study of Transnationalism: Pitfalls and Promise of an Emergent Research Field." *Ethnic & Racial Studies* 22:217-237.
Portes, Alejandro and John Walton. 1981. *Labor, Class, and the International System*. New York: Academic Press.
Ricketts, Erol. 1987. "U.S. Investment and Immigration from the Caribbean." *Social Problems* 34:374-387.

Roberts, J. Timmons. 1995. "Subcontracting and the Omitted Social Dimensions of Large Development Projects: Household Survival at the Carajas Mines in the Brazilian Amazon." *Economic Development and Cultural Change* 43:735-758.
Rowlands, Dane. 1999. "Domestic Governance and International Migration." *World Development* 27:1477-1491.
Sainz, J.P. Perez. 1998. "The New Faces of Informality in Central America." *Journal of Latin American Studies* 30:157-179.
Sanderson, Matthew R. and Jeffrey D. Kentor. 2008. "Foreign Direct Investment and International Migration: A Cross-National Analysis of Less-Developed Countries, 1985-2000." *International Sociology* 23.
Sassen, Saskia. 1988. *The Mobility of Labor and Capital: A Study in International Investment and Labor Flow*. Cambridge: Cambridge University Press.
—. 2007. *A Sociology of Globalization*. New York, NY: W.W. Norton and Company.
Sauvant, Karl P., Padma Mallampally, and Persephone Economou. 1993. "Foreign Direct Investment and International Migration." *Transnational Corporations* 2:33-69.
Shandra, John M., Jenna Nobles, Bruce London, and John B. Williamson. 2004. "Dependency, Democracy, and Infant Mortality: A Quantitative, Cross-National Analysis of Less Developed Countries." *Social Science and Medicine* 59:321-333.
—. 2005. "Multinational Corporations, Democracy, and Child Mortality: A Quantitative, Cross-National Analysis of Developing Countries." *Social Indicators Research* 73:267-293.
Sheikha Haya Rashed Al Khalifa, H.E. 2006. "Chairperson's Summary of the United Nations General Assembly High-Level Dialogue on International Migration and Development." *International Migration Review* 40:966-972.
Stallings, Barbara. 2007. "The Globalization of Capital Flows: Who Benefits?" *Annals of the American Academy of Political and Social Science* 610:201-216.
Stata. 2005. *Reference Manual, Version 9*. College Station, TX: Stata Press.
Swamy, P.A.V.B. and S.S. Arora. 1972. "The Exact Finite Sample Properties of the Estimators of the Coefficients in the Error Components Regression Models." *Econometrica* 40:261-275.
Tapinos, George P. 1991. "Development Assistance Strategies and Emigration Pressure in Europe and Africa." Washington, D.C.: United States Commission for the Study of International Migration and Cooperative Economic Development.
Taylor, J. Edward. 1987. "Undocumented Mexico-U.S. Migration and the Returns to Households in Rural Mexico." *American Journal of Agricultural Economics* 69:626-638.
—. 2006. "International Migration and Development." United Nations International Symposium on International Migration and Development, Population Division, Department of Economic and Social Affairs, Turin.
UN. 1992. *World Investment Directory*. New York, NY: United Nations.
—. 1994. *World Investment Directory*. New York, NY: United Nations.
—. 1996. *World Investment Directory*. New York, NY: United Nations.
—. 2000. *World Investment Directory*. New York, NY: United Nations.
—. 2003. *World Investment Directory*. New York, NY: United Nations.
—. 2006a. "International Migration and Development: Report of the Secretary-General." United Nations, New York, NY.

—. 2006b. "Trends in the Migrant Stock: The 2005 Revision." Department of Economic and Social Affairs, Population Division.
UNCTAD. 1996. "Foreign Direct Investment, Trade, Aid and Migration." United Nations: Current Studies Series A, No. 29, UNCTAD/DTCI/27, Geneva.
—. 2005. "Major FDI Indicators." UNCTAD.
Wawro, Gregory. 2002. "Estimating dynamic panel data models in political science." *Political Analysis* 10:25-48.
WB. 2006a. "Key Development Data and Statistics." vol. 2006. New York: World Bank.
—. 2006b. "World Development Indicators, 2006." World Bank.
Williamson, Jeffrey G. 1988. "Migrant Selectivity, Urbanization, and Industrial Revolutions." *Population and Development Review* 14:287-314.
Wooldridge, Jeffrey M. 2006. *Introductory Econometrics: A Modern Approach, 3rd Edition*. Mason, OH: Thomson Southwestern.
Yang, Philip Q. 1998. "The Demand for Immigration to the United States." *Population and Environment* 19:357-383.
Zelinsky, Wilbur. 1971. "The Hypothesis of the Mobility Transition." *Geographical Review* 61:219-249.
Zolberg, Aristide R. 1989. "The Next Waves: Migration Theory for a Changing World." *International Migration Review* 23:403-430.