Trade Globalization, Economic Development, and the Income Stratification Process

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ABSTRACT

The relationship between education and income is a cornerstone of the study of social stratification, but little is known about how and why the strength of this relationship varies in broad cross-national perspective. This paper presents a model for how the education-income relationship might be modulated by development status, focusing on differences in the relative importance of education-as-credential and education-as-knowledge for determining adult income in developing versus developed countries. The model suggests, and statistical results confirm, that higher levels of trade globalization are associated with an attenuation of the education-income relationship in developing countries, but a strengthening of the education-income relationship in developed countries.
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Perhaps the most widely tested and confirmed model in sociology is the status attainment model (Blau and Duncan, 1967) linking education and income over the life course and across generations. The status attainment model has been applied repeatedly to regional and national samples in the United States, as well as internationally in countries such as Germany and Poland (Krymkowski, 1991), Hungary (Luijkx et al, 2002), Japan and Korea (Kim, 2003), and Australia (Marjoribanks, 1996). A core element of the standard status attainment model is the relationship between an individual's level of education in early life and that individual's later adult income level. One's parents' education and income are important, but affect one's adult income mainly through their effects on one's educational attainment, which then influences one's adult income. Over the past forty years, the education-income relationship has been one of the major foundations, if not the major foundation, of stratification research.

Little attention has been focused, however, on how emerging forces of globalization might affect the status attainment process in broad, cross-national perspective. This might be because there is little agreement even on what globalization is: Smith (2001) goes so far as to suggest that a common definition may be neither desirable nor productive. Though theorists have formulated a wide variety of definitions of globalization, empirical studies have generally focused on operationalizing globalization using foreign trade (Babones, 2007). Trade as a proportion of national income, however, seems not to be statistically related to many variables of sociological interest, including economic growth (Rodriguez and Rodrik, 1999), population growth (Kentor, 2001), or income inequality (Babones and Vonada, 2006). Is all the recent
attention paid to globalization in sociology simply overblown? Or are there important aspects of the effects of globalization on society that are not being captured in the empirical literature?

There is some evidence that though globalization seems to have little impact on broad societal aggregates like income and population, it may affect social structure - a potentially more interesting prospect for sociological research. An interesting first result in this direction is reported by Meyer (2003). Meyer shows that globalization (operationalized using a variety of trade variables) is associated with reduced levels of occupational segregation by gender, especially in the peripheries of the world-economy. Occupational segregation is an important stratification outcome, but more interesting from a status attainment perspective would be to know whether or not stratification processes themselves are affected by globalization. An extensive literature search revealed no broadly cross-national empirical research on this question. The reason for this is likely the lack of broadly cross-national data on stratification processes.

Likely the only possible source of data for broadly cross-national research on status attainment is the World Values Survey (2006). The World Values Survey waves 3 and 4 (1994-2004) include data on education and income for 100,383 adults in 81 countries around the world, including both developed and developing countries. It is thus possible to use World Values Survey data to study how differences in a key step in the status attainment process, the education-income relationship, correlate across countries with levels of globalization. Sufficiently detailed data do not exist to understand how changes in global integration affect status attainment processes within countries over time, but even a cross-sectional snapshot across countries would add substantially to our current knowledge of status attainment processes. The results of such a study are reported here.
The first section below presents a bifurcation model of how globalization might be expected to affect the status attainment processes, depending on a country's level of development. The second section details variable operationalizations and data sources for testing this model statistically. The third section reports graphical and statistical results. The final section incorporates an interpretation of the results and suggestions for future research.

**MODELING THE INTERSECTION OF GLOBALIZATION AND THE EDUCATION-INCOME RELATIONSHIP**

Theorists of globalization have generally described it as a kind of broad, all-pervasive force that has been reshaping the world in recent decades. They have documented the emergence of global forms of economic organization (Gereffi and Korzeniewicz, 1994; Ritzer, 1993), global forms of political organization (Fukuyama, 1992; Boswell and Chase-Dunn, 2000), global culture (Tomlinson, 1999; Featherstone, 1990), and even global anti-globalization resistance movements (Brecher et al, 2000; O'Brien et al, 2000). The unit of analysis in globalization theory is generally the world as a whole. Empirical researchers, however, have largely ignored the plethora of theoretical treatments of globalization's effects on the world to focus on measuring the correlation (if any) between countries' levels of exposure to the larger world-economy and specific national outcomes. "Globalization" in this literature is generally operationalized simply as the ratio of a country's levels of foreign trade to national income. The unit of analysis in the empiricist literature on globalization is generally the country. The country, of course, has also been the primary ecological level at which systems of social stratification have been modeled (Wright, 1979). Accordingly, in this paper both globalization and status attainment are modeled at the country level.
In the classic status attainment model, higher levels of childhood educational attainment are associated with higher levels of adult social status, primarily operationalized as adult income. The transmission mechanism of education into income is mainly through achieved status, though ascribed status (inherited from parents) also plays an important role (Blau and Duncan, 1967). Most current cross-national research on status attainment focuses on the relative importance of ascribed status across countries, mainly developed countries, with a particular emphasis on comparing levels of intergenerational social mobility (Breen and Jonsson, 2005). In a structural equation modeling context, it is possible to decompose the education-income relationship into separate streams of influence of ascribed and achieved status through the estimation of simultaneous equations. For the present study, however, only individual education and income data are available, without the benefit of intergenerational data or other powerful instrumental variables. The education-income relationship thus must be modeled here in isolation.

The individual-level correlation between education and income measures the degree to which education operates as both an intervening variable on the path to labor market success (in the case of ascribed status) and as an original source of that success (in the case of achieved status). The independent variable in this relationship, individual educational attainment, incorporates elements both of credentialing and of knowledge gained in school. In societies where educational credentials and knowledge are important for labor market success, the correlation between education and income will be strong, while in societies in which credentials and knowledge are less important, it will be weak. A first approximation of the relative importance of these two components of education - credentials and knowledge - in driving the education-income relationship might be to assume that education-as-credential is relatively more important in developing countries while education-as-knowledge is relatively more important in
developed countries. A simple conceptual model, holding the overall importance of education constant, is depicted in Figure 1.

[FIGURE 1 ABOUT HERE]

In Figure 1, the top line (Ed) represents the overall importance of education for determining adult income in a country at the level of development represented on the horizontal axis. Regardless of the level of development of a country, the total importance of education is assumed to be the same. Ecological evidence (across countries) to support this assumption will be presented later in the paper; direct evidence for individual countries gathered as they develop over time will likely never be available. The downward-sloping line (Cr) and upward sloping line (Kn) represent the degrees to which education-as-credential and education-as-knowledge, respectively, are important for determining adult income. In developing countries, educational credentials are assumed to be more important for adult income than educational knowledge; in developed countries, the reverse. In the absence of any empirical basis for assigning relative weights to the importance of education-as-credential and education-as-knowledge, they have been depicted in a balanced fashion. In what follows, the actual slopes of the lines Cr and Kn are not important; the relevant fact is that together they sum to the line Ed, which has slope zero.

It is widely assumed (though again, systematic cross-national evidence is lacking) that globalization has increased the relative importance of knowledge for adult income attainment. By implication, credentials (as such - independent of the knowledge embodied in those credentials) are becoming less important. A schematic representation of these shifts in the importance of credentials and knowledge for adult income is depicted in Figure 2. The depicted importance of credentials for income at any given level of development has been (arbitrarily) reduced by 50% through the shift of the line Cr to a new position Cr'. Similarly, the depicted
importance of knowledge for income has been increased 50% through the shift from Kn to Kn'.
Interestingly, these together result in a shift in the overall importance of education for adult income from Ed to Ed'. What was a flat relationship becomes upwardly sloped: in developing countries, globalization leads to a reduction in the importance of education for income, while in developed countries, globalization leads to an increase in the importance of education for income. This bifurcated outcome results despite the fact that globalization is hypothesized to have the same effect everywhere on the absolute importance of credentials (decrease 50%) and knowledge (increase 50%). Some simple algebra shows that this is a general outcome, not related to the specific magnitudes of the impacts of globalization depicted in Figure 2.

[FIGURE 2 ABOUT HERE]

The proof of this follows from four basic assumptions about the model:

(i) the relationships Cr is linear (with negative slope),
(ii) the relationship Kn is linear (with positive slope),
(iii) the relationship Ed is linear with zero slope, and
(iv) the effects of globalization are linearly multiplicative.

Assumption (iv) is not strictly necessary, but simplifies the mathematical demonstration. Let the slopes of Cr, Kn, and Ed be represented by $\alpha$, $\beta$, and $\gamma$, respectively. From (iii) and by construction:

$$\alpha + \beta = \gamma = 0$$

Let the effect of globalization on $\alpha$ be represented by $g^-$ and the effect of globalization on $\beta$ be represented by $g^+$ such that:

$$0 < g^- < 1$$
$$g^+ > 1$$
In other words, globalization reduces the importance of credentials for income by a fixed factor anywhere between 0% and 100%, while globalization increases the importance of knowledge by a fixed factor of any size. The impact of credentials cannot be reduced below zero. These multiplicative effects of globalization on the importance of credentials and knowledge do not depend on a country's level of development. The slopes of $Cr'$, $Kn'$, and $Ed'$ (under the influence of globalization) are then given by:

$$\alpha' = \alpha - g\alpha$$
$$\beta' = \beta + g\beta$$
$$\gamma' = \alpha' + \beta'$$

Substituting for $\alpha'$ and $\beta'$ in the equation for $\gamma'$ yields:

$$\gamma' = g\alpha + g\beta$$

or

$$\gamma' = -g\beta + g\beta$$

since $\alpha + \beta = 0$. Rearranging terms yields:

$$\gamma' = \beta(g^+ - g^-)$$

By assumption (ii), $\beta$ is positive, and by definition $(g^+ - g^-)$ is necessarily positive. Since a positive number times a positive number always results in a positive number, $\gamma'$ must also be positive. According to the model, in developing countries globalization will tend to reduce the importance of education for adult income attainment, while in developed countries globalization will tend to increase the importance of education.

**VARIABLES AND OPERATIONALIZATION**
Three key country-level variables are required for an empirical demonstration of the bifurcation model presented above: a measure of development, a measure of the importance of education in determining adult income attainment, and a measure of globalization. The relationships of these variables with average national levels of education and income might also be of interest, and so these variables were collected as well. Sources and operationalizations for each of these variables are detailed below.

**Measuring Development**

Level of development is often operationalized using national income per capita. This approach can ignore institutional and human development factors that are also qualitatively important in understanding the differences between "more developed" and "less developed" countries, but it is pragmatic in that national income per capita data are widely reported. The World Bank (2000) uses national income per capita to divide the countries of the world into "high income" and "low and medium income" categories. For convenience, this categorization is adopted here. The World Bank's 1999 "high income" countries are treated as "developed," while all other countries are treated as "developing."

**Measuring the Importance of Education in Adult Status Attainment**

Individual-level education and income data are available for respondents in 81 countries from the World Values Survey (2006), waves 3 and 4. Interviews for these waves were conducted over the years 1994-2004; the midpoint of this period (1999) is used as the reference year for this study. Education is operationalized using WVS variable X025, an 8 point ordinal scale of the respondent's highest level of educational attainment. Income is operationalized
using WVS variable X047, a 10 point ordinal scale of respondent income designed to approximate the income deciles in each WVS country. Only data for unambiguously working-age adults (age 25-54) were used. The resulting dataset includes education and income data for 100,383 adults in 81 countries.

The importance of education in status attainment is operationalized as the simple correlation of education and income in each country. Correlations were computed based on combined data from both Waves 3 and 4, using the sampling weights provided in the WVS database. Respondents from the Northern Ireland and Great Britain surveys have been combined to form a single United Kingdom total. The resulting correlations for 81 countries are reported in Table 1. All correlations are significant at the $p < .001$ level, and all are in the expected direction (positive) except for that for Armenia, which is mildly negative. The Armenian survey was conducted in 1997, a time of dramatic upheaval; this may explain the perverse result.

[TABLE 1 ABOUT HERE]

There is no significant difference in the strength of the education-income correlation in developing versus developed countries ($t_{79} = .332$). There are, however, significant differences among developing countries by region. Mean levels of the education-income correlation are reported in Table 2. The strongest levels are found in the developing countries of Africa, Latin America, and south Asia, where the correlation between education and income is stronger than in developed countries. The correlation between education and income is weakest in the developing countries of east Asia, eastern Europe, and the Middle East. In all regions, however, it is highly significantly greater than zero.

[TABLE 2 ABOUT HERE]
Measuring Globalization

Three variables have typically been used to operationalize globalization in the broad cross-national empirical literature: foreign trade, foreign direct investment, and foreign portfolio investment, each expressed as a ratio to national income. Of these three, trade is by far the one most commonly used. There are two very practical reasons for using trade to operationalize globalization: first, unlike investment, trade is relatively stable year-to-year (Babones, 2007); second, trade statistics are simply published for more countries and more time periods than almost any other potential globalization indicator. The use of the ratio of trade to national income is not, however, unproblematic as an operationalization of globalization. At least two serious measurement issues must be addressed.

One is that the ratio of trade to national income exhibits a strong positive skew. This is natural, since trade is bounded by zero on the left but is unbounded on the right (a country's level of trade can, and in many cases does, exceed its level of national income). As a result, the ratio of trade to national income exhibits a positive skew on the order of 1.5. This can be reduced effectively to zero through logging. Trade has typically not been logged in the globalization literature, but the empirical and methodological arguments for logging the data are incontrovertible.

More difficult to solve is the fact that the ratio of trade to national income is correlated with country size. Small countries rely on foreign markets (for both imports and exports) more than large countries. This is because much of the excess small country trade represents cross-border "neighbor" trade rather than long-distance "global" trade. One way to adjust for this bias is to residualize trade by regressing it on population. The operationalization of globalization thus
becomes the residual of a regression of logged trade (expressed as a ratio to national income) on logged population.

In the analyses that follow, globalization is primarily operationalized using the residualization procedure described above, though parallel results are reported using a simple logged trade series. Trade as a proportion of national income is taken for most countries from World Development Indicators (WDI) database (World Bank, 2004). Data are for the year 1999. In three cases (Iraq, Singapore, Taiwan) data were not available in the WDI, so data from the CIA World Factbook (Central Intelligence Agency, 2007) were used instead. World Factbook data for 1999 are not comparable to the WDI trade series, so data for 2006 were used instead for these three countries. Singapore is a 3.5 standard deviation positive outlier even in trade as a ratio to national income (even after logging), as well as a highly influential point in preliminary regression analyses (greatly strengthening the significance of the predicted results), and thus was excluded. The regression used to produce the residualized measure of globalization had an $R^2$ of .371. Singapore was not included in this regression.

**Other Variable Operationalizations**

Though the bifurcation model for the effect of globalization on the education-income relationship requires as inputs only the three variables described above, the behavior of this model under the influence of two additional country-level controls might be of interest. National average educational attainment and national income per capita are the ecological counterparts of the two individual-level variables that go into computing the education-income correlation. Data for both are taken primarily from the World Development Indicators (World Bank, 2004). National income per capita is operationalized using the World Bank's Atlas series for gross
national product per capita. Data for 1999 are used. As above, for Iraq, Singapore, and Taiwan
CIA World Factbook data for 2006 are used (Central Intelligence Agency, 2007). National
income per capita is logged to eliminate positive skew.

Cross-national data on average educational attainment are notoriously incomplete and
error-prone, but the secondary school gross enrollment ratio serves as a reasonable proxy. The
gross enrollment ratio is the ratio of the population of secondary school age to the number of
children actually enrolled in secondary school. It tends to be highly correlated with average
educational attainment where such data are available. The data used here are mainly 1999
secondary school gross enrollment ratios from UNESCO's Global Education Database
(UNESCO Institute for Statistics, 2006). Where 1999 data were unavailable the next available
year (2000-2005) was used. In one case (Sweden) the published 1999-2003 figures were clearly
aberrant, so the 2004 entry was used instead. Four countries (Bosnia and Herzegovina, Puerto
Rico, Singapore, and Taiwan) were completely missing in the UNESCO data. For these
countries, the secondary school gross enrollment ratio was estimated through a regression on
logged national income per capita ($R^2 = .566$). Since education and national income are not
primary focuses of this study, the collinearity introduced by this procedure is not a major
concern.

STATISTICAL RESULTS

Correlations of the five main variables of interest are reported in Table 3. Singapore is
here excluded, leaving a total of 80 countries (53 developing and 27 developed). In the full
panel, the importance of education for adult income (column 1) is significantly correlated only
with the schooling measure (secondary school gross enrollment ratio, row 4). The reported
negative correlation makes sense, since it would be expected that as a larger proportion of the population attends school, the stratifying power of schooling would decline.

[TABLE 3 ABOUT HERE]

The correlation of the education-income relationship (1) with GNP per capita (5) in the full panel is essentially zero, as anticipated in Figure 1 and assumed in the mathematical model for the impact of globalization on the education-income relationship. The positive correlation of (1) and (5) in the developing country panel, however, combined with the negative correlation in the developed country panel, suggest the possibility of a non-linear relationship. A scatterplot of the education-income correlation against GNP per capita is presented in Figure 3. The relationship is, in fact, mildly quadratic, but the observed curvature is not statistically significant (p > .1). The assumption in the bifurcation model of linearity in the relationship with a slope of zero is thus not rejected by the data.

[FIGURE 3 ABOUT HERE]

The correlation of the education-income relationship (1) with globalization (2) is, as predicted by the model, significantly negative in developing countries and (marginally) significantly positive in developed countries. Substituting trade (3) for the preferred globalization measure does not affect these outcomes - though it does make the relationship clearly significant in developed countries. The fact that the full panel effect of globalization is also to reduce the education-income correlation is due to the fact that about twice as many developing as developed countries are included in the full panel; thus, the developing country pattern dominates. The bifurcated effect of globalization found in the correlations reported in Table 3 is confirmed in the regression models reported in Table 4. Even after controlling for the ecological impact of education and national income, globalization reduces the education-income
correlation in developing countries (model 3) while increasing it in developed countries (model 4), though the coefficient misses significance for developed countries. Again, these effects are robust with respect to the operationalization of globalization (models 5 and 6), and the significance of the coefficient becomes clearly significant for developed countries when trade is used. The predictions of the bifurcation model are thus confirmed.

[TABLE 4 ABOUT HERE]

INTERPRETATION AND CONCLUSIONS

Higher levels of globalization are clearly associated with lower correlations between education and income in developing countries. This result is robust with respect to the operationalization of globalization chosen and the presence of ecological covariates. It does not conclusively demonstrate that globalization is causally responsible for a decline in the strength of the correlation between education and income, but it is consistent with that conclusion. The conclusion of causality is also consistent with the bifurcation model presented above.

The same model predicts a positive association between globalization and the education-income correlation in developed countries. Statistical evidence bears this out. Countries that are more engaged in the global economy have higher correlations of education with income than countries that are less engaged. The results are not as statistically significant as for developing countries, but this can be attributed to the fact that the developed country panel is only half as large. Again, as for developed countries, causality has not been demonstrated, but the results are consistent with a causal relationship between globalization and the education-income correlation.

Ideally, changes in the education-income relationship should be tracked within countries over time to establish this causality. Results from a prospective fifth wave of the World Values
Survey might establish a sufficiently long timeline for such a study, but it will be years before such data are available - if they are ever available. Even if and when they are available, the timeline represented will still be rather short - no more than ten years for most countries. It is unlikely that it will be possible to observe changes in the structure of status attainment processes over such a short time period. Remembering that the average lag time across the entire population between childhood educational attainment and adult income attainment is twenty years (assuming a forty-year working career), it would be surprising if any longitudinal results were ever observed: there are few national longitudinal studies that ask the same questions in the same way over a forty year period; it would be folly to wait for a broadly cross-national one.

An alternative route to demonstrating causality is to introduce sufficient statistical instrumentation to eliminate plausible alternative explanations of the structured cross-national relationship between globalization and the education-income correlation. The problem with this approach is the lack of sufficient degrees of freedom for effective instrumentation. The largest possible panel available for study is just 80 cases, and the requirement to model developing and developed countries separately reduces this even further. The models presented in this paper may seem relatively sparsely specified, but globalization as measured here only explains some 10% of the total cross-national variation in the education-income correlation to begin with, and the more variables are added to the models the less power will remain to test the significance of the globalization coefficient. The instrumental variable route is thus also unlikely to bear fruit, even if appropriate instrumental variables can be found.

This leaves the detailed country case study as the only realistic option for further exploration into the mechanisms through which globalization affects the status attainment process. Such studies might investigate, for example, the relative importance of education-as-
credential versus education-as-knowledge in industry sectors that are differentially exposed to global influences. They might also study shifts in employment between such sectors. It is entirely possible, however, that the impact of globalization operates not at the micro level but at the macro level: increased exposure to the wider world might broadly change the nature of how a society values the importance of education, as suggested by the classic modernization literature (Inkeles and Smith, 1974) and its critics (Portes, 1973). If this is the case, longitudinal attitudinal survey data might be used to detect the expected change in values. With luck, the international expansion of the General Social Survey (GSS) might soon make such data available - though it will have to be teased out, since the GSS only asks about the importance of education for occupations, without distinguishing explicitly between education-as-credential and education-as-knowledge.

In short, despite the centrality of the status attainment model to the study of social stratification, which is arguably the most important process studied by sociologists, the existing data infrastructure is inadequate for testing even the most elementary claims about causality in a broadly comparative perspective. This might be because the basic elements of the status attainment model are so widely accepted that in recent years there has been little impetus for additional research to investigate them further. The wide and systematic international differences in the education-income relationship documented here should raise doubts about the discipline's complacency about status attainment. One result of this study, certainly, is crystal clear: the details of the status attainment process differ dramatically across countries.

Such research is especially relevant for policy formation in countries that are members of increasingly integrated trade blocs. These include Nafta, Mercosur, Ecowas, Asean, and other international groupings, but most importantly, the European Union (EU). The EU is by far the
most advanced supernational grouping in terms of the creation of a single market for labor. Labor mobility across the EU, especially between the historical and new accession EU states, is a major focus of EU policy formation. Differences in the details of status attainment processes across EU states might be enormously consequential for understanding mobility in the emerging Europe-wide single market for labor. As other regional economic groupings follow the EU path towards greater labor market integration, comparative studies of status attainment processes may become increasingly important in the developing world as well. The results presented in this paper only hint at the potential complexity of how social stratification systems might respond to the challenges of the 21st century international political economy.
REFERENCES


### Table 1. Countries' levels of correlation between education and income (c.1999)

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<td>Estonia</td>
<td>0.282</td>
<td>Netherlands</td>
<td>0.313</td>
<td>Uruguay</td>
<td>0.540</td>
</tr>
<tr>
<td>Finland</td>
<td>0.247</td>
<td>New Zealand</td>
<td>0.269</td>
<td>Venezuela, RB</td>
<td>0.380</td>
</tr>
<tr>
<td>France</td>
<td>0.306</td>
<td>Nigeria</td>
<td>0.434</td>
<td>Vietnam</td>
<td>0.077</td>
</tr>
<tr>
<td>Georgia</td>
<td>0.106</td>
<td>Norway</td>
<td>0.181</td>
<td>Zimbabwe</td>
<td>0.375</td>
</tr>
</tbody>
</table>
Table 2. Strength of the education-inequality correlation by region (c.1999)

<table>
<thead>
<tr>
<th>Region</th>
<th>Mean</th>
<th>SD</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.327</td>
<td>0.153</td>
<td>53</td>
</tr>
<tr>
<td>East Asia &amp; Pacific</td>
<td>0.213</td>
<td>0.120</td>
<td>5</td>
</tr>
<tr>
<td>Europe &amp; Central Asia</td>
<td>0.261</td>
<td>0.123</td>
<td>23</td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>0.466</td>
<td>0.115</td>
<td>10</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>0.281</td>
<td>0.096</td>
<td>7</td>
</tr>
<tr>
<td>South Asia</td>
<td>0.450</td>
<td>0.151</td>
<td>3</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.454</td>
<td>0.159</td>
<td>5</td>
</tr>
<tr>
<td>Developed countries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.316</td>
<td>0.118</td>
<td>28</td>
</tr>
<tr>
<td>All Countries</td>
<td>0.323</td>
<td>0.141</td>
<td>81</td>
</tr>
</tbody>
</table>
Table 3. Correlations of key variables for complete, developing country, and developed country panels (c.1999)

<table>
<thead>
<tr>
<th></th>
<th>All countries (N=80)</th>
<th>Developing countries (N=53)</th>
<th>Developed countries (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>(1) Education-income correlation</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Globalization (residualized trade)</td>
<td>-0.352 **</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>(3) Trade/GNP (log)</td>
<td>-0.331 *</td>
<td>0.790 ***</td>
<td>1</td>
</tr>
<tr>
<td>(4) Secondary enrollment ratio (log)</td>
<td>-0.260 +</td>
<td>0.020</td>
<td>0.216</td>
</tr>
<tr>
<td>(5) GNP per capita (log)</td>
<td>0.199</td>
<td>-0.081</td>
<td>0.064</td>
</tr>
</tbody>
</table>

+ p < .10

* p < .05

** p < .01

*** p < .001
Table 4. Regression models for countries' levels of correlation between education and income (c.1999)

<table>
<thead>
<tr>
<th>Model</th>
<th>All Countries (N=80)</th>
<th>Developing Countries (N=53)</th>
<th>Developed Countries (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
</tr>
<tr>
<td>Globalization (residualized trade)</td>
<td>-.163</td>
<td>-.298*</td>
<td>0.289</td>
</tr>
<tr>
<td>Trade/GNP (log)</td>
<td>- .080</td>
<td>-.250*</td>
<td>0.393*</td>
</tr>
<tr>
<td>Secondary enrollment ratio (log)</td>
<td>-.552**</td>
<td>-.575***</td>
<td>-.123</td>
</tr>
<tr>
<td>GNP/capita (log)</td>
<td>0.420*</td>
<td>0.526***</td>
<td>-.201</td>
</tr>
<tr>
<td>R-squared</td>
<td>.165</td>
<td>.358</td>
<td>.174</td>
</tr>
</tbody>
</table>

+ p < .10  
* p < .05  
** p < .01  
*** p < .001
Figure 1. Decomposition of the education-income relationship
Figure 2. Globalization and the education-income relationship

Importance of education for income increases in developed countries

Importance of education for income decreases in developing countries
Figure 3. Curvature in the relationship between the education-income correlation and national income (N=80; c.1999)