

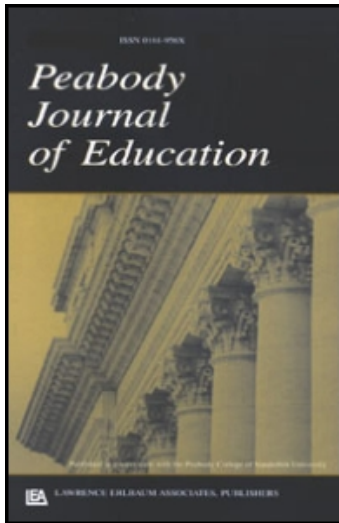
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Peabody Journal of Education

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t775653692>

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Online Publication Date: 01 January 2008

To cite this Article Payne, Brandyn L.(2008)'Compulsion, Craft, or Commodity? Education Services Trade in the Larger Context',Peabody Journal of Education,83:1,133 — 153

To link to this Article: DOI: 10.1080/01619560701649257

URL: <http://dx.doi.org/10.1080/01619560701649257>

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Compulsion, Craft, or Commodity? Education Services Trade in the Larger Context

Brandyn L. Payne

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The role of education in fostering economic growth and social development is universally recognized. Although history places the provision of education firmly within national control, countries increasingly search outside national borders for alternative distribution frameworks. Tellingly, the World Trade Organization recently included education as service trade sector in the General Agreement for Trade in Services (GATS) negotiations. Such activity increases debate about control as countries struggle to create policies that balance nationalism with economic responsiveness. This study employed multivariate data to question whether trade openness in 162 countries was associated with openness to trade in education, and whether countries' commitments to lower barriers to education trade paralleled the strength of their commitments to lower barriers to all trade.

Among the findings were the following: (a) On average, countries with education commitments experienced slightly higher levels of general trade openness than those without education commitments; (b) in lower-middle-income countries, education trade openness and general trade openness were positively related; and (c) when controlling for education, population, geography, and income, lower levels of education trade barriers were the single best predictor of countries' having made education commitments under GATS. A model for systemic improvement in education trade policymaking is also presented.

The critical role of education in fostering economic growth and social development is universally recognized. However, cultural and ethical concerns continue to inspire education debate. Although historical precedent places the provision of education firmly within national control, heightened access and efficiency

requirements increasingly drive countries to search outside national borders for higher quality, equitable access and improved distribution frameworks.

Such searches shape current domestic education policy, as evidenced by dramatic growth in the private provision of education products, services, and programs. Without exception, industrialized democracies have elected to contract with nongovernmental suppliers for textbooks, educational software, testing, administrative activities, and countless other products and services.

These supply relationships often span international borders, constituting a growing element of international trade. In 2004, the United States alone exported over \$13.5 billion in education services, an 11% increase over 2003 (U.S. International Trade Commission, 2006). As further evidence of this growth, the World Trade Organization (WTO) recently included education as sector of service trade within the General Agreement for Trade in Services (GATS) negotiations (WTO, 2001). Such activities increase the intensity of debate over who controls a nation's education (Heyneman, 2001, 2003; Jarvis, 2000; Larsen, Morris, & Martin, 2002; Lenn, 2000; Sauve, 2002; WTO, 2001), as nations struggle to build education policies that balance nationalism with economic responsiveness.

Critics suggest that trade in education abrogates a nation's right to provide for its own citizens (Larsen et al., 2002, and others). Others suggest that wealthy or well-positioned nations will dominate trade, threatening the existence of local cultures, languages, and learning priorities (Altbach, 2001, 2002, 2003; Hill, 2001; Naidoo, 2007; Nyborg, 2002; Van Den Wende, 2001).

But is education trade really all that different from consulting, telecommunications, or information technology trade? Did countries that have made education services commitments under GATS consider education's unique value when making commitments, or were they more likely to propose and support policies that mirrored their general trade agendas? Or put differently, is the widely proposed view that education cannot be considered as a service to be traded even valid?

To discover what factors are associated with a nation's trade policy in education, it is first necessary to ask, What is the nature of the relationship between countries' openness in education trade and their position on general trade issues? More specifically, Is education trade openness a component of larger trade openness, and what characteristics are associated with countries that have already made education commitments?

Why are these questions important? The subject of trade in higher education services often inspires debate and confusion among decision makers, particularly as need for access continues to grow. In recent years, several researchers (see Knight, 2002a, 2002b; Larsen et al., 2002; Lenn, 1999; Lenn & Miller, 2000; Sauve, 2002; Van den Wende, 2001, for examples) and agencies (see American Council on Education, 2004; Organisation for Economic Cooperation and Development [OECD], 2002; U.S. Department of Commerce, 1998, 2000; WTO, 1999a, 1999b, for examples) have published work on GATS and liberalized trade

and its impact on education. However, much of this work is declarative, designed to inform researchers, policymakers, and the public about the provisions of the agreement, the current barriers to trade, and potential benefits or drawbacks. Increasingly, researchers are calling for more rigorous analysis of the potential risks and opportunities of increased education trade (Knight, 2002a, 2003; Larsen et al., 2002; Nguyen-Hong & Wells, 2000; Sidhu, 2007) as well as stronger measures and collection instruments (Ascher, 2001; Asia-Pacific Economic Cooperation, 2001; Kemp, 2001; Knight, 2003; OECD, 2002; Sauve, 2002; WTO Secretariat, 2001, and others).

This study seeks to add to the limited body of current research while using the ongoing WTO–GATS negotiations as a reference point for discussion of trade barriers, openness, and policymaking. To strengthen the analysis, this study also draws heavily from other disciplines, including economics (Pritchett, 1994; Rose, 2002) government, and education (Kemp, 2001; Larsen et al., 2002; McGuire & Schuele, 2000).

“OPENNESS” AS INDICATOR

Central to the notion of increased mobility is the idea of “openness” in a country’s trade policy. A common measure of trade openness is the ratio of imports and exports divided by aggregate Gross Domestic Product (trade/GDP) for a particular moment in time, defined by Pritchett (1994) and others as the *trade intensity* of a particular economy. Economists and educational researchers alike have struggled to measure the effects of trade policy on openness and growth (Dollar, 1992; Dollar & Kraay, 2001; Edwards, 1997; Greenaway, Morgan, & Wright, 2002; Sachs & Warner, 1995). In their 2001 study, “Trade, Growth, and Poverty,” Dollar and Kraay asked, “What can we expect to happen when developing countries liberalize trade and participate more in the global trading system?” They found that increased trade openness led to faster economic growth and improved standards of living for millions of the world’s poor.

In a 1994 article, Pritchett used 16 potential measures to assess outward orientation for lesser developed countries, including policy incidence, average tariff levels, structure-adjusted trade intensity, Leamer’s Openness Index, and trade and price distortion. He found none of these measures to be significantly useful for measuring openness for the 168 countries present in the Penn World Table (PWT).

In 2002, Andrew Rose used Pritchett’s individual variables, along with a trade/GDP measure, as openness indicators in a study analyzing links between trade openness and WTO membership. Rose concluded that little evidence existed that WTO member countries had more liberal trade patterns than nonmember countries (see Figure 1).

$$Open = \frac{X + M}{D_y + X - M}$$

X = Value of all exports

M = Value of all imports

D_y = Total of all domestic consumption and investment, public and private; GDP

FIGURE 1 Formula for openness (Pritchett, 1994).

Any study of trade growth must consider that some researchers guard against using the trade/GDP ratio and/or the concept of “openness” as a basis for classifying countries’ trade policies as open or closed to outside providers. Birdsall and Hamoudi (2002) argued that for countries that are highly dependent on commodities for their export revenue, the trade/GDP ration overstates the importance of trade policy in economic growth. Although this may be the case, the acceptability of openness within the education trade community, including its use in recent studies of education trade (see, e.g., Kemp, 2001; Nguyen-Hong & Wells, 2000), renders it appropriate for this analysis.

METHODOLOGY AND RATIONALE

This study uses descriptive and inferential statistics to test the hypothesis that education openness is not a function of overall trade openness. These measures are consistent with recent literature analyzing the relationship between trade openness and a variety of factors (Edwards, 1997; Greenaway et al., 2002; McGuire & Schuele, 2000; Rose, 2002; Sachs & Warner, 1992).

One would assume that if a positive relationship exists between education trade openness and general trade openness, education trade currently functions as a component of a country’s larger trade context (see Figure 2). If no relationship, or a negative one, is found, one may conclude that education is operating in a different trade context from overall trade efforts for the countries in this sample.

The sample for this analysis is composed of all countries included in Rose’s 2004 study correlating openness with World Trade Organization membership

Sample	A ←	→ B
All countries (<i>n</i> =162)	<i>Trade Openness</i> (Rose, 2003)	<i>GATS Education Commitments - Y/N</i> (WTO, 1999)

FIGURE 2 Is education openness a function of general trade openness?

$$r_{pb} = \frac{M_1 - M_0}{\sigma_y} \sqrt{pq}$$

Where:

r is the point-biserial correlation coefficient

M_p is the mean general trade openness for countries with education commitments

M_q is the mean general trade openness for countries without education commitments

s is the standard deviation for openness values

p is the fraction of countries with education commitments

q is the fraction of countries without education commitments.

FIGURE 3 Formula for point-biserial correlation (Chen & Popovich, 2002).

($n = 162$, taken from the PWT, version 6.1). The PWT database was used to capture trade openness statistics over time by selecting five instances over the past 20 years, beginning with 1980 and ending with 2000. The point-biserial correlation coefficient, a particular type of correlation statistic used to estimate the relationship between a continuous variable (overall trade openness) and a naturally dichotomous variable (in this case, the presence or absence of education trade commitments under GATS), was used to conduct this correlation analysis. Results from these procedures are described in the Findings section of this article.

To answer the second research question (What characteristics are associated with countries that have made education commitments?), a set of regression techniques were used to compare the dependent variable of commitments to education services trade against a variety of explanatory variables, including presence of barriers to education trade, foreign enrollment, and general trade openness while controlling for geographic and economic differences between countries. This investigation is consistent with recent, if limited, studies analyzing the impact of educational services trade (Kemp, 2001; Larsen et al., 2002; Nguyen-Hong & Wells, 2000; see Figure 3).

In the case of the second question, one would hypothesize that explanatory variables have differing levels of effect on countries' probability of having made commitments to education trade. In reviewing the literature, it has been suggested that education barriers are an important consideration in countries' willingness to make commitments to education trade (Kemp, 2001; Nguyen-Hong & Wells, 2000). However, it may be the case that other factors, including foreign enrollment, the subsectors in which a country chooses to focus commitment, or even a country's overall trade volumes may have a greater impact on the outcome. Similarly, variables that are not currently collected at a discrete level—such as subsector with the greatest export movement, education services import and export revenue, and private investment in education services—may influence countries' likelihood of having made education commitments.

Data Availability

This study uses secondary data available through research literature and the Internet. The specific data set used to report overall trade openness values is the PWT, version 6.1, maintained by the Center for International Comparison at the University of Pennsylvania. The PWT reports purchasing power parity, international pricing statistics, and other basic economic indicators for 168 countries from 1950 to 2000. Data from the PWT are used by the Organization for Economic Cooperation and Development (OECD), the European Union, UNESCO, the World Bank, and other global organizations to report economic data for domestic and international trending and tracking purposes (Heston, Summers, & Aten, 2002). In an attempt to describe the recent education trade landscape, the 2000 PWT data collection was used to answer both research questions.

Openness data for a handful of countries were not available through the 2000 PWT sample. For these countries, publicly available UNESCO and OECD data were used to generate openness measures for 2000 (these substitutions are noted in the technical notes listed in the appendix). In addition, data specifically related to higher education when forced to make a choice about which subsectors on which to report. The rationale for this, consistent with the rest of this study, is that higher education represents the largest and most aggressive subsector of the education services market.

Data for the dependent and explanatory variables used in the regression analysis were also collected through publicly available sources, including databases maintained by the WTO, UNESCO, OECD, and the World Bank. Individual variables are operationalized in the following section with their original sources and any alternative collection methods noted.

Operationalization of Variables

Overall, one independent variable and five dependent variables were used in this analysis. Unless noted, 2000 is used as the baseline year for all observations. Variables restricted to a particular subsector of education trade reflect higher education statistics.

[WOPEN]: Overall Trade Openness (2000). WOPEN is a continuous, independent measure of individual countries' overall trade openness. This is a commonly accepted measure of an individual country's "openness" to outside goods and services as well as the impact of this cross-national trade on overall economic health. WOPEN is used as the basis for correlation in this analysis. It is identical to the PWT 6.1 OPENC measure. In the case of countries for which PWT 6.1 data for 2000 were not available, a proxy measure was substituted for WOPEN.

[COMMYN]: Presence of education commitments (2000). COMMYN is a dichotomous, dependent variable representing the presence or absence of education trade commitments under GATS, where 0 is *no commitment* and 1 is *commitment*. For consistency with WOPEN, commitments are reflected as current for 2000–2001. Verification of these commitments was taken from the WTO Services database (<http://www.wto.org>), in which countries' overall service commitments under the Doha Round are represented in matrix form.

[EDBAR]: Presence of education service trade barriers (2000). EDBAR is an independent variable used to quantify the distribution of a particular country's current barriers to education services trade. Its calculation is based on work by Hoekman (1995), McGuire and Schuele (2000), and Kemp (2001). For this analysis, barriers are analyzed specifically for the higher education subsector (see Knight, 2002b, 2003).

Barriers are weighted based on the country's level of commitment to liberalization, using a frequency index developed by Hoekman (1995) and used previously by Kemp (2001). The index is based on GATS commitment schedules and follows a three-value scoring system: a full commitment to liberalize trade is assigned a score of 0, a partial commitment is assigned a value of 0.5, and an unbound commitment is given a value of 1.

Possible rankings range from 0 to 8, with 8 representing the highest presence of barriers to the free import and export of education services. Values represented by the countries in this analysis range from 0 (Congo RP, Lesotho, Sierra Leone, and Slovenia) to 8 (countries with no commitments under GATS). For the three countries for which national-level data were not available, recent publications by the WTO and WTO member nations were used to approximate values for countries in which barriers were thought to be present. In addition, the barrier scores in this analysis were transformed for consistency in interpretation into an inverse scale based on the total possible number of barriers, represented as [8-EDBAR].

[EDCOMW]: Weighted value of education commitments (2000). In contrast to the variable EDCOM, EDCOMW ranks the distribution of a country's trade commitments based on their subsector. This scheme, created by Kemp (2001) to better illustrate the importance of higher education commitments to the overall education services trade debate uses an interval scale of .00 to 1 to quantify the level of commitment. Although primary, secondary, adult, and other education subsectors are assigned a value of .15, higher education receives a value of .4 to denote its position as the most traded sector (remaining sectors are measured at .15) (2001).

Values for countries included in Sample 2 range from 0 (e.g., Estonia) to a perfect 1 (Czech and Slovak Republics, Lesotho, and Sierra Leone).

[FORENR]: Foreign enrollment as a percentage of overall enrollment (2000). This continuous dependent variable attempts to quantify education services trade by using foreign enrollment as percentage of overall enrollment in tertiary education. The decision to use this variable as a proxy for overall education trade volume by country was based on a study done by Larsen et al. (2002). In that study, WTO and OECD data were used to approximate education trade as a percentage of overall trade value for OECD countries in 2000. Although the results provided a broader analysis of the overall import and export of education services, education trade data were only available for 11 countries, making any generalization to the larger global community extremely difficult. In contrast, data on foreign enrollment in higher or tertiary education are available for a greater sample of countries, making it a better fit for the research questions pursued in this analysis.

In addition to these variables, eight independent variables were used in the probit regression to control for between-country differences in geography, population, education, and income (see Table 1). These controls are similar to those used by Rose (2002) and others (Kemp, 2001; Nguyen-Hong & Wells, 2000) to mitigate demographic and economic differences between countries that could account for invalid effects. All control variables were pulled from the World Development Indicators database for 2000, and all are used in their original form in this analysis.

Educational Openness Index

No single measure exists to quantify the volume or impact of education services trade for a particular country. Although attempts have been made to quantify the

TABLE 1
Bivariate Data Summary (Correlating Openness With Education Commitments)

	<i>M</i>	<i>SD</i>	<i>r</i> _{bpi}
All countries ^a	85.966	43.302	.132
High income ^b	102.807	56.636	-.256
Upper-middle income ^c	113.622	41.787	.148
Lower-middle income ^d	70.280	29.925	.310**
Low income ^e	71.042	28.795	.150

^a*N* = 162. ^b*n* = 37. ^c*n* = 30. ^d*n* = 46. ^e*n* = 49.

***p* = .05 level (two-tailed).

$$Z_{\text{edcom}} = b_0 + bX_{\text{edbar}} + bX_{\text{wopen}} + bX_{\text{forenr}} + bX_{\text{geo1}} + bX_{\text{geo2}} + bX_{\text{pop1}} + bX_{\text{pop2}} + bX_{\text{ed1}} + bX_{\text{ed2}} + bX_{\text{incom1}} + bX_{\text{incom2}}$$

FIGURE 4 Model for probit regression (Pampel, 2000).

value of overall services trade (Konan & Maskus, 2004; OECD, 2002; and others), the lack of specific education data for most countries makes drawing conclusions difficult. In an effort to focus attention on quantifying education trade (Kemp, 2001; Larsen et al., 2002; Nguyen-Hong & Wells, 2000), the EDBAR, EDCOMW, and FORENR variables were transformed into an index designed to judge countries' relative "openness" as related to the cross-border movement of education services (see Figure 4). After reviewing existing literature, it was determined that such an index could reasonably be constructed from a variety of measures used in recent research (Center for Quality Assurance in International Education, 1999; Knight, 2002b; Larsen et al., 2002; McGuire & Schuele, 2000). Two recent indexes of note are the aforementioned trade restrictiveness index implemented by Kemp (2001) and the set of *trade restrictiveness indexes* constructed by a team of researchers from Australia's Productivity Commission, the University of Adelaide, and the Australian National University (Nguyen-Hong & Wells, 2000). Although this Index was created with the intent that a multivariate model would provide stronger predictive ability than recent, univariate research studies, the lack of available data rendered it virtually useless for the purposes of this analysis. However, it bears mention here as a possible method for strengthening analyses around predictors of education trade, particularly as data quality and quantity increases over time.

Procedures

Data were collected from the aforementioned publications and online databases during the summer and fall of 2004. Individual countries were identified in the data set by country name and ISO classification code.

Two statistical techniques of note were used in this analysis. The first was a point-biserial correlation, a Pearson product-moment correlation designed to correlate a continuous variable with a dichotomous variable (Brown, 1996). Like the Pearson r , the $rpbi$ can range from 0 to +1.00 if the two scales are related positively and from 0 to -1.00 if the two scales are related negatively (or stated differently, in opposite directions). The higher the value of $rpbi$ (positive or negative), the stronger the relationship between the two variables. The point-biserial correlation is used in this analysis to analyze the relationship between countries' general trade openness (WOPEN) and the presence or absence of education services commitments under GATS (COMMYN; see Figure 5). The traditional Pearson r was used for additional correlation analyses between quantitative variables.

$$EOI = [1/3 (P_1 + P_2 + P_3)]$$

Where:

P_1 = Presence of barriers to education trade [EDBAR]

P_2 = Weighted distribution of education services commitments under GATS [EDCOMW]

P_3 = Foreign tertiary enrollment as a percentage of overall enrollment [FORENR]

FIGURE 5 Educational openness index (based on work by Kemp, 2001, and Nguyen-Hong & Wells, 2003).

A probit regression model was also employed in this analysis (see Figure 5). Probit coefficients correspond to the b coefficients in regression or logit coefficients in logistic regression. To interpret the effects of probit, one transforms the coefficients based on the standard normal curve and expresses the results in terms of marginal effects on the likelihood of the probability of a specified value of X (Pampel, 2000). This difference is called the *elasticity* of the probability of the dependent variable (Y) in respect to the independent variable, when all variables are held at their sample means. Elasticity is the effect of a unit increase in the independent variable on the probability that the dependent = 1, when all other independents are held constant at their mean values (Pampel, 2000).

Missing Data

Because of the lack of specific data on education trade collected across all countries, several measures were employed to address missing data in this analysis. Procedures for treatment of missing data are detailed in the larger paper (Payne, 2005).

FINDINGS

Is Education Trade Openness a Component of Larger Trade Openness?

General trade data comparing countries with education commitments versus those without commitments under GATS is summarized for 1980, 1985, 1990, 1996, and 2000 in Figure 6. Although overall trade openness has trended upward over the past 20 years, countries with education services commitments ($M = 71.0$) experienced significantly greater general trade openness than did countries with no education services commitments under GATS ($M = 48.0$). Results indicated a significant difference in overall mean trade openness, $t(54.7) = 5.43$, $p = .001$.

The point-biserial correlation between general trade openness and openness to educational services trade resulted in an insignificant result, $r_{\text{pbi}}(160) = .132$. In an effort to compare results irrespective of national economic characteristics,

$$Pr(y=1|x) = \Phi(xb)$$

Where:

Φ is the standard cumulative normal probability distribution

xb is the probit score or index

FIGURE 6 Formula for probit regression (Pampel, 2000).

additional correlations were run for groups of countries divided by World Bank income classifications (high-income OECD and non-OECD, middle-upper income, middle-lower income, and low income; World Bank, 2004). It was found that for lower-middle-income countries, a significant positive relationship exists between general trade openness [WOPEN] and the presence of education trade commitments [COMMYN]. That is, only in lower-middle-income countries such as the Philippines and Indonesia would one expect to see an increase in overall trade openness as the number of education commitments increase. For countries at high- and low-income levels, results were insignificant (see Table 2).

What Characteristics Are Associated With Countries That Have Made Education Commitments?

Descriptive statistics for the variables included in the probit regression are reported in Table 1 for all observations in the sample ($N = 162$). According to results from the probit regression, the greatest single indicator of education commitments comes from the reduction of barriers to trade, such as unfavorable tax restrictions, needs tests, visa and work permit requirements, and citizenship

TABLE 2
Descriptives for Variables Included in Probit Regression

<i>Variable Label</i>	<i>Variable Description</i>	<i>N</i>	<i>M</i>	<i>SD</i>
EDBAR	Presence of education barriers	162	7.4691	1.21927
WOPEN	General trade openness	163	85.9658	43.30192
FORENR	Foreign enrollment as % of overall enrollment	163	1.8613	5.40412
GECON1	Geography control: Land area in square miles	163	745378.8	2013437
GECON2	Geography control: Arable land % total	163	15.8013	13.81265
POPCON1	Population control: Population per square mile	163	169.0736	537.41301
POPCON2	Population control: Population as % of total	163	54.7829	22.81294
EDCON1	Education control: Literacy rate, adult total	163	79.68746	15.975207
EDCON2	Education control: Primary completion rate	163	75.4022	21.01235
INCON1	Income control: GNI per capita	163	5876.0000	8691.442
INCON2	Income control: GDP per capita as growth %	163	2.4984	3.68225

Note. GNI = gross national income; GDP = gross domestic product.

TABLE 3
 Probit Estimates of Variables Affecting Presence of Education Commitments

<i>Variable</i>	<i>Model 1</i>	<i>Marginal Effect</i>
Presence of education barriers	-.97043 (-5.66176)***	0.26065
General trade openness	.00416 (1.23103)	—
Foreign enrollment as % of overall enrollment	.01906 (.80982)	—
Geography: Land area in square miles	.00000 (1.64955)	—
Geography: Arable land % total	.01285 (1.14213)	—
Population: Population per square mile	-.00078 (-.75725)	—
Population: Population as % of total	-.00746 (-1.13972)	—
Education: Literacy rate, adult total	.00073 (.07547)	—
Education: Primary completion rate	-.00164 (-.24639)	—
Income: GNI per capita	.00001 (.52993)	—
Income: GDP per capita as growth %	-.05828 (-1.39599)	—
Constant	6.60693***	—

Note. Dependent variable is whether or not a country has made a commitment to Education Services under the General Agreement for Trade in Services. All values reported are for 2000. GNI = gross national income; GDP = gross domestic product.

*** $p < .001$.

requirements. That is, a 1-unit decrease in the presence of these trade barriers is responsible for a .26 or 26% increase in the likelihood of a country having made commitments to education services trade, controlling for geographic, population, education, and income variables. The t statistic for this result is significant at $p \leq .001$.

Coefficients for general trade openness and foreign enrollment produced positive impacts on the likelihood of education trade commitments; however, these coefficients were not significant at the .05 level. Other characteristics included in the model, such as general trade openness and foreign enrollment, do not have an identifiable impact on the likelihood of countries' having made education commitments. Full results of probit coefficients and their associated t statistics are reported in Table 3.

DISCUSSION

In answer to the research question What is the relationship between education services trade and overall trade?, results indicated that for lower-middle-income countries, education services trade commitments were positively correlated with higher levels of general trade openness. That is, as the number of education services trade commitments increases for a particular country, one finds a corresponding increase in that country's value of imports plus exports, divided by GDP. Although these results represent only the 2000–2001 calendar year (the most recent and

complete data available), it is assumed that this relationship would also be visible in subsequent years of data collection. As more recent observations become available through OCED, UNESCO, WTO, and World Bank data collection efforts, it will be useful to repeat this analysis with time-series data.

No significant association was found for high-income, upper-middle-income, and lower-income countries. This is not surprising, given that so few countries in the upper-middle and lower income brackets have made education services trade commitments. For high-income (OECD and non-OECD) countries, this lack of effect is also consistent with recent research on the effects of WTO membership on general trade openness, where findings indicated no significant relationship between membership in the WTO and overall trade openness (Rose, 2002).

The presence of a positive correlation between education services trade commitments and general trade openness is consistent with emergent education trade activities and policymaking in many of the 46 lower-middle-income countries. In countries like Brazil, the Dominican Republic, Turkey, China, Thailand, and Indonesia, significant efforts are underway to understand the potential opportunities in expanded education services trade and to construct mechanisms for deploying new modes of learning. For these countries, education trade would seem to mirror a larger trend toward increased marketization and privatization in all facets of the economy.

As an example, consider several lower-middle-income countries in southeast Asia. The Philippines, Indonesia, and Thailand, though largely lacking education commitments under GATS at this stage of the WTO negotiations, are each involved in initiatives designed to increase trade in education services.

Thailand has aggressively pursued liberalization in recent years, in part because of increasing access for its growing postsecondary student population. In 2003, only 27.4% of eligible Thai students were enrolled in higher education. Thailand has negotiated a variety of initiatives, including twinning arrangements such as an undergraduate double-degree program in tropical agriculture between Kasetsart University, Melbourne (Australia)-based Victoria University, and the American School of Bangkok, which provides an internationally focused undergraduate program licensed by the Thai Ministry of Education (Sadiman, 2004).

Recent policies have also resulted in favorable conditions for education services trade in Thailand. Under the Thailand-Australia Free Trade Agreement (2004), Thai secondary and higher education services could operate in Australia in all modes of supply except Mode 2. In turn, Australian higher education services operating in Thailand are limited to programs in life science, biotechnology, and nanotechnology and must be situated outside metropolitan areas. This arrangement represents an exciting type of bilateral agreement that uniquely positions Thailand to take advantage of market forces in Australia while expanding national access in areas of great need (Sadiman, 2004).

Funding cuts as a result of the 1988–1989 economic crisis forced Indonesia to examine outside sources for the provision and funding of education services. Today, more than 56% of funding for tertiary education comes from private sources (Fredriksson, 2004). Indonesian students can attend the courses at the University of Phoenix over the Internet, and the Ministry of Trade is fully committed to opening markets to education services trade over time. Twinning agreements are occurring at both the intranational level (a partnership between the relatively new University Al-Azhar Indonesia and the Bandung Institute of Technology) and at international levels (as in the Netherlands Education Center in Indonesia's offering some 1,150 tertiary study programs; Sadiman, 2004).

In the Philippines, no specific tertiary education programs are underway as a result of GATS. However, a large number of professional and technical schools have been created in recent years to train health care and nursing professionals, both nationally and internationally. In addition, recent concern has arisen about the presence of diploma mills, programs of dubious quality that have consistently failed the Professional Regulation Commission quality assurance exam. Unfortunately, the presence of such programs is likely a temporary by-product of increased openness in educational services trade, until regulation and competition weed out most subpar providers. It is hoped that Thailand might serve as a model to the Philippines as the country expands its nongovernmental education offerings from technical and professional training increasingly toward alternate methods of traditional tertiary education.

What does this data mean? At a minimum, that southeast Asian lower-middle-income countries, and others like them, are working aggressively to open their borders to education trade and that, although cultural and social concerns about the unique nature of education may have some relevance, they are not the criteria upon which countries are making decisions. Although innovating in response to national demand, these countries have also recognized a market for their services outside local borders. Education could quite possibly be a unique provision, but practically speaking for these lower-middle-income countries, education efforts are following the marketization trends seen in nearly every sector of an increasingly global economy.

Is education unique? Is education trade subject to different parameters than overall trade? What is the relationship between education and the market? This study indicates that for at least the lower-middle-income countries, education trade is not different from general trade. However, further research into all levels of education and studies using powerful, multivariate methods will provide the most comprehensive picture of trade behavior.

When considering the question, How is education services trade related to overall trade?, results indicated that when controlling for demographic factors such as national population, geography, income, and educational attainment, education barriers produced a moderate effect on overall trade openness (i.e., countries with

TABLE 4
 Sample Descriptive Statistics for Educational
 Openness Index

<i>N</i>	<i>Mid</i>	<i>Max</i>	<i>M</i>	<i>SD</i>
22	.30	.68	.51	.081

fewer education barriers had, on average, slightly higher levels of general trade openness).

In further investigating this relationship through a probit regression technique, it was determined that the presence of education barriers was responsible for a 26% marginal effect on the likelihood that a country holds at least one education services commitment under GATS. Neither foreign enrollment and overall trade openness nor the control variables included in the model had significant marginal effects on the regression or probit outcomes.

Again, this finding is consistent with existing literature dealing with GATS and its potential impact on education services trade. Limiting the presence of barriers to trade was identified early in the negotiations as an essential goal of progressive liberalization (WTO Secretariat, 1998), and more recently, studies have attempted to measure and quantify the impact of these barriers (Kemp, 2001; Nguyen-Wells & Hong, 2000). In each case, researchers have pointed to difficulties in data collection and the role of future researchers in extending the models and methodologies represented in their work to estimate the impact of these barriers on countries' educational markets—including cost, quality, and public expenditure—as well as on longer term measures of economic health.

A final area of interest is the creation of an Educational Openness Index. In an effort to add to recent attempts to focus attention on quantifying education trade (Kemp, 2001; Larsen et al., 2002; Nguyen-Hong & Wells, 2000), three variables were transformed into an index designed to judge specifically countries' relative "openness" as related to the cross-border movement of education services. Sample results from this index are presented in Tables 4 and 5.

As mentioned previously, the limited sample size ($n = 24$) made statistically useful results from Educational Openness Index analyses difficult to provide. In addition, no comparisons across income levels were possible because of sample size. Although such an Index would doubtlessly provide more robust information about the strength of education services trade, results indicated that because of lack of available data measures, such calculations are premature.

Given the limited data available and lack of consistent measures of reporting across countries and regions, it is imperative that results of this and all analyses in this study be considered preliminary and of limited generalizability, particularly for non-OECD-developed and developing countries, for which data are particularly

TABLE 5
Sample Education Openness Indexes for Selected Countries

Country	EDBAR	EDCOMW	FORENR	EOINDEX
Australia	3.00	.69	5.64	.43
Austria	3.00	.45	8.75	.51
Belgium	3.00	.85	34.25	.68
Czech Republic	2.50	1.00	2.37	.52
France	3.50	.85	21.30	.56
Japan	6.50	.85	2.00	.30
Mexico	2.50	.85	.60	.45
Slovak Republic	2.50	1.00	1.40	.51

difficult to obtain. More research is needed to determine the exact nature of these results as well as their impact over time.

Limitations and Areas for Further Analysis

As with any study of education trade, missing and incomplete data are the primary limitation of this analysis. For example, the EOINDEX variable could be calculated for only 22 of the 44 countries that have committed to opening their education services markets under GATS. In addition, missing data for countries across data cycles required that in several cases data substitution measures were necessary. The full version of this article includes detailed technical notes describing these substitutions.

Rigorous analysis of education trade is limited by the data collected at national and international levels, particularly regarding collection itself. A large percentage of least developed and developing countries do not collect and report even basic cross-national education statistics. Data collection is time-intensive and expensive,

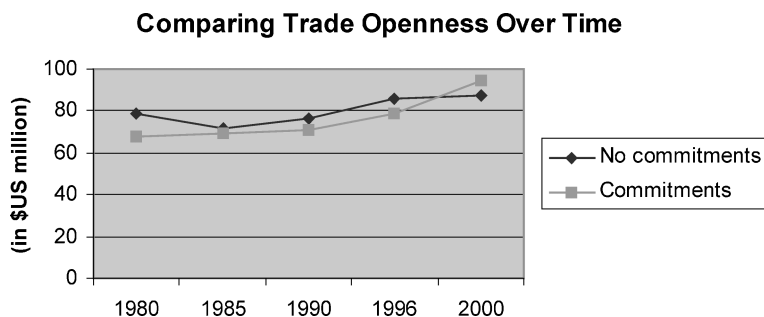


FIGURE 7 Comparison of trade openness between countries with/without commitments under GATS.

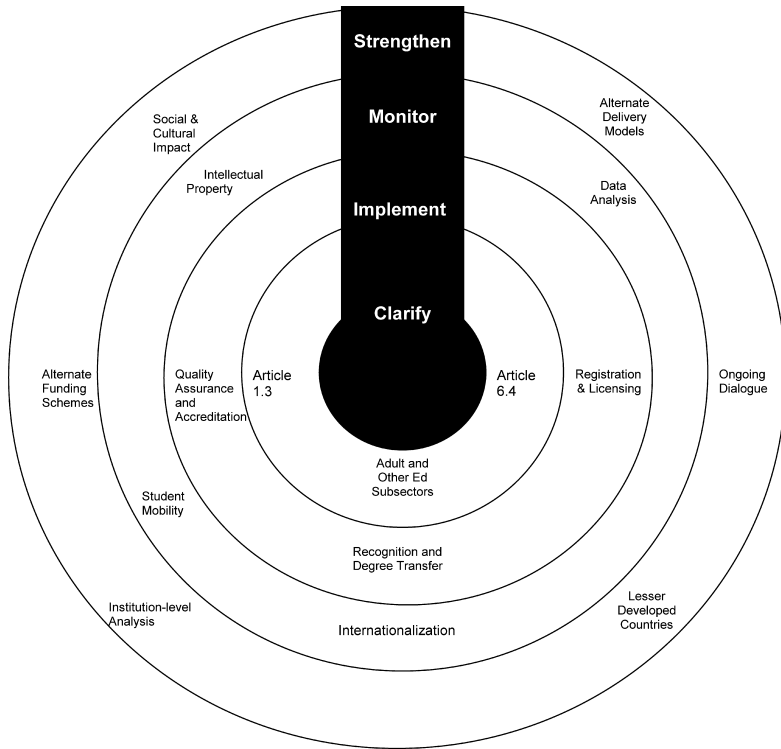


FIGURE 8 A systemic model for improvement in education services trade (Payne, 2005).

and particularly in the case of developing countries, time and attention often (and rightly) fall to domestic education issues over cross-border trade. Better measures are needed to ensure accuracy in data analysis, and more structured collection methods can strengthen the quality of currently available data (Knight, 2002b, 2003; Larsen et al., 2002; Nguyen-Hong & Wells, 2000, and others).

Second, most countries do not segment their import and export of education goods, programs, and services from their overall trade statistics. In their WTO–GATS proposals, Australia, the United States, Japan, and New Zealand call for involvement from other nations in better tracking of education trade measures. Statistics such as numbers of foreign students by country of origin, education goods and services as percentages of overall import and export, percentage of private versus public spending on education, and amount of spending on lifelong learning and education programs do not exist in aggregate today, even for many developed countries. It is recommended that these variables be adjusted to reflect the four modes of education services supply under GATS (Kemp, 2001; Knight, 2002a, 2003; Larsen et al., 2002; Nguyen-Hong & Wells, 2000; Sauve, 2002).

Regarding directions for future research, the model described in Figure 7 represents the synthesis of countless recommendations related to better understanding of the impact of GATS on the education-attaining public. Designed to flow from items of critical short-term importance outward to longer term, ongoing areas of inquiry, this model segments key areas of policy opinion and analysis into four major recommendations: clarification, implementation, modification, and strengthening (Payne, 2005). It is my intention that this model serve as a foundation for ongoing research and study related to the increasing focus on cross-border movement of educational resources, goods, services, and materials.

Is education unique, or is it subject to the same market forces as transportation, textiles, and other trade sectors? It is likely too soon to tell. However, for those countries that are considering making commitments to reduce barriers to trade, these early findings may provide one avenue for analyzing the relative threats and opportunities of liberalizing access to education programs.

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APPENDIX

TECHNICAL NOTES REGARDING DATA COLLECTION AND TRANSFORMATION

A. Procedure for developing master WOPEN dataset:

1. Generate overall list of countries from PWT 6.1
2. Assign values for education commitments based on WTO Online Database.
3. Exclude countries for which no openness *or* education trade commitment exists (45):

Aruba, Andorra, Afghanistan, Netherlands Antilles, American Samoa, Bahamas, Bosnia and Herzegovina, Bermuda, Bhutan, Cambodia, Channel Islands, Cayman Islands, Eritrea, Faeroe Islands, Micronesia, Greenland, Guam, Isle of Man, Iraq, Kiribati, Laos, Liberia, Libya, Monaco, Marshall Islands, Northern Mariana Islands, Mayotte, New Caledonia, Oman, Palau, Puerto Rico, French Polynesia, Saudi Arabia, Samoa, Sudan, San Marino, Somalia, Turkmenistan, Tonga, Taiwan, Uzbekistan, US Virgin Islands, Vietnam, Vanatu, West Bank and Gaza.

4. In cases where WOPEN exists but no information can be found on education commitments, assign value of 0 (no commitment) to country (26):

Albania, Algeria, Armenia, Azerbaijan, Belarus, Cape Verdi, Comoros, Croatia, Ethiopia, Georgia, Iran, Jordan, Kazakhstan, Lebanon, Lithuania, Moldova, Macedonia, Nepal, Russia, San Tome and Principe, Seychelles, Syria, Tajikistan, Ukraine, Yemen, Yugoslavia.

5. In cases where WOPEN does not exist but education commitments do, correct for missing data by substituting the mean WOPEN measure for the World Bank economic indicator associated with the missing country (28):

Low income ($M = 68.87023231$)

Angola, Central African Republic, Haiti, Myanmar, Mongolia, Mauritania, Papua New Guinea, Democratic Republic of Korea, Sierra Leone, Solomon Islands, Congo DP

Lower-middle income ($M = 67.07508853$)

Djibouti, Fiji, Guyana, Namibia, Suriname, Yugoslavia

Upper-middle income ($M = 109.6473437$)

Botswana, Maldives

High income ($M = 119.2172347$)

United Arab Emirates, Bahrain, Brunei, Cyprus, Kuwait, Liechtenstein, Malta, Qatar, Singapore