POLICY BARRIERS AND THEIR INFLUENCE ON THE GLOBAL EXPANSION OF EDUCATIONAL INSTITUTIONS

HaiHui Wang*, Juan Liu

School of Digital Economics and Management, Wuxi University, Wuxi 214105, Jiangsu, China. Corresponding Author: HaiHui Wang, Email: wanghh@cwxu.edu.cn

Abstract: Policy barriers present major challenges to the development of educational services trade, especially amid rising global trade protectionism, which further restricts the overseas operations of educational institutions. This study examines the impact of such barriers on the international expansion of educational institutions, using educational trade data and the Services Trade Restrictiveness Index (STRI) across 55 countries from 2008 to 2017. Following the General Agreement on Trade in Services (GATS), we analyze effects across its four supply modes. Our results show that policy barriers under Mode 3 (commercial presence) strongly inhibit overseas expansion. Notably, the impact differs by income level: in high- and lower-middle-income countries, barriers under Mode 1 (cross-border supply) reduce Mode 3 trade, indicating complementarity between these modes; in contrast, for upper-middle-income countries, Mode 1 barriers encourage Mode 3 trade, revealing a substitutive relationship. These findings suggest that educational institutions adjust their market-entry strategies according to policy restrictiveness, either combining multiple modes or substituting one for another depending on context.

Keywords: Educational services trade; Policy barriers; Cross-border education; International branch campus; Online education

1 INTRODUCTION

With accelerating globalization and deeper integration of international labor markets, cross-border collaboration in education has become a key strategy for national competitiveness. Consequently, trade in educational services is gaining global importance. According to the General Agreement on Trade in Services (GATS), this trade occurs via four modes: (1) cross-border supply (Mode 1), including online education; (2) consumption abroad (Mode 2), where students study overseas—the dominant form; (3) commercial presence (Mode 3), involving foreign institutions establishing local campuses; and (4) movement of natural persons (Mode 4), where educators work abroad under institutional employment.

Mode 2 remains the largest, but Mode 3, driven by foreign direct investment through international branch campuses (IBCs), has grown rapidly [1]. The expansion of IBCs reflects a strategic shift toward physical presence abroad, facilitating local partnerships and overcoming market entry barriers. Since the early 20th century, elite universities from the U.S., Europe, and Australia have expanded into East and Southeast Asia and the Middle East, enhancing both institutional prestige and host countries' educational competitiveness while offering students accessible, cross-cultural opportunities.

However, rising trade protectionism has constrained IBC development. Education trade intersects uniquely with national sovereignty concerns, and only 58 GATS members have liberalized their education sectors [2]. Policy barriers like restrictive visa rules and investment limits increase costs and operational challenges for foreign institutions.

Most research on transnational education focuses on micro-level factors—operational models, management, risk [3] —and key determinants like campus origin, location, strategy, and regulatory engagement [4]. Yet, macro-level analysis of Mode 3 policy barriers and their impact on branch campus growth remains scarce, a critical gap amid rising anti-globalization and protectionism.

While Mode 3 barriers clearly limit foreign direct investment, their effects on other modes—especially the relationship between Modes 1 and 3—are unclear. Classical trade theory suggests substitution between trade and FDI [5], implying Modes 1 and 3 may substitute. However, empirical evidence shows sector-specific variation, with some services displaying complementarity and others substitution. Unlike Mode 2 (low barriers) or Mode 4 (often tied to Mode 3), the interaction between Modes 1 and 3 remains unresolved.

Understanding this interaction is crucial. A substitutive relationship would let institutions bypass restrictions by switching modes, undermining regulation; complementarity would amplify the negative impact of barriers across both modes. This distinction matters greatly for policymakers shaping education trade and for institutions planning internationalization in an era of rising protectionism. Addressing this question is key to improving regulatory frameworks and ensuring fair access to global education markets.

2 LITERATURE REVIEW

2.1 Policy Barriers under Mode 1 of Educational Services Trade

Mode 1, encompassing online education, correspondence courses, and educational software, has rapidly expanded with digital technology. Despite its ability to overcome geographic limits, online education is often seen as a supplement rather than a full substitute for face-to-face instruction [6-7].

However, several policy barriers constrain Mode 1 development. First, many countries impose explicit restrictions to protect domestic providers, limiting foreign market access. For example, China has yet to liberalize Mode 1 education under WTO commitments, though regional initiatives like the Shanghai Free Trade Zone show tentative openness [8]. Second, the lack of a unified international framework complicates cross-border accreditation and quality assurance, increasing compliance costs [9]. Third, technical and regulatory challenges—including internet firewalls, content filtering, and infrastructure disparities—limit global resource accessibility and program effectiveness [10]. Fourth, data governance regulations such as the EU's GDPR restrict cross-border data flows, raising compliance burdens [11-12]. Lastly, institutional resistance to digital learning slows policy innovation [13-14].

2.2 Policy Barriers under Mode 3 of Educational Services Trade

Mode 3 involves foreign commercial presence, primarily through branch campuses, which support goals like revenue diversification, brand building, and internationalization [15-17]. Yet, their growth is restricted by host-country FDI regulations concerning market access, ownership, location, and digital infrastructure use [18-19].

Diverse national regulations also challenge foreign campuses in faculty management, academic quality assurance, and compliance with financial and administrative rules [20]. For instance, India's regulatory inconsistencies and cultural frictions have hindered progress despite formal openness [21]. Political instability and economic volatility further disrupt operations via abrupt policy changes and financial uncertainty [22]. Institutions must also navigate local intellectual property and data protection laws, adding operational complexity [23].

2.3 Complementarity or Substitution between Modes 1 and 3

A key debate is whether Modes 1 and 3 complement or substitute each other. Some studies argue for complementarity, where FDI (Mode 3) reinforces cross-border services (Mode 1). Evidence from finance and education sectors supports this [24-27]. For example, Benz and Jaax find that Mode 3 restrictions reduce trade in Modes 1 and 4 [28], indicating complementarity.

Conversely, other research highlights substitution: tighter restrictions on one mode push trade to the other. Riker and Barbe et al. show that higher Mode 1 barriers lead providers to shift toward Mode 3 [29-30]. EU sector studies also confirm this substitution effect [31]. Thus, the Mode 1–3 relationship likely varies by sector, strategy, and regulatory context.

2.4 Research Gaps and Hypotheses

Current literature mainly focuses on institutional or sector-specific factors, lacking macro-level analysis of how policy barriers affect trade across modes, especially amid rising protectionism. It remains unclear whether restrictions in one mode impact others within educational services.

This study tests the following hypotheses:

H1: Policy barriers under Mode 3 inhibit educational service trade via Mode 3.

H2: Policy barriers under Modes 1 and 4 also negatively affect Mode 3 trade.

H3: There is a complementary relationship between Modes 1 and 3 in educational service trade.

2.5 Econometric Model Specification

To validate the impact of policy barriers on the development of educational institutions in overseas markets, an econometric model is constructed as follows:

$$IMP_M 3_{it} = \alpha + \beta STRI_{it} + Z'_{it}\gamma + \varphi_i + \varphi_t + \varepsilon_{it}$$
(1)

 $IMP_M3_{it} = \alpha + \beta_1 STRI_M1_{it} + \beta_2 STRI_M3_{it} + Z'_{it}\gamma + \varphi_i + \varphi_t + \varepsilon_{it}$ (2)

In this study, the total imports under Mode 3 of educational services of a country are used as the dependent variable, representing the flow of educational service trade formed by foreign educational institutions establishing branches in that country. The model constructs independent variables from the indices of policy barriers both overall and specific to different supply modes, and the empirical analysis is conducted using control variables and fixed effects. The explained variable IMP_M3_{it} represents the trade volume of educational services under Mode 3, with subscripts *i* and *t* denoting the country and year, respectively. The core explanatory variables STRI represent the indices of service trade policy barriers; lower index values indicate fewer policy restrictions in a country's service sector and a higher degree of policy openness. The indices for restrictions under Mode 1 and Mode 3 are denoted $STRI_M1_{it}$ and $STRI_M3_{it}$ respectively. If the coefficient β is significantly negative, it indicates that policy barriers have a negative impact on the trade of educational services under Mode 3, suggesting that restrictive service trade policies affect the expansion of educational institutions in foreign markets. Z stands for control variables, including the size of the economy, economic growth prospects, total population, and social stability. Country and year fixed effects are denoted φ_i and φ_t

respectively; ε_{it} represents the random disturbance term. Additionally, to reduce heteroscedasticity, control variables are logarithmically transformed, except for dummy variables.

2.6 Core Indicator Measurement

Dependent Variable: Trade Volume of Educational Services (Mode 3). The core dependent variable in this study is the trade volume of educational services under Mode 3, which captures the extent of cross-border educational activities involving the commercial presence of foreign institutions. This variable is proxied by the import value of educational services under Mode 3 for a given country-year, reflecting the host country's receipt of educational services through foreign subsidiaries and campuses. Data are obtained from the WTO's Trade in Services by Mode of Supply (TiSMoS) database, covering the period from 2008 to 2017, which reports trade values disaggregated by all four modes of services trade.

Key Explanatory Variable: Policy Barrier Restrictiveness Index. The Policy Barrier Restrictiveness Index serves as the key explanatory variable, capturing the overall regulatory restrictiveness of a country's services trade environment. Data are derived from the Services Trade Restrictiveness Index (STRI) compiled by the WTO and OECD, which quantifies trade policy barriers for 23 service sectors across 75 countries. Each policy measure is scored on a scale from 0 (fully open) to 100 (completely restricted).

While the STRI does not report sector-specific scores for educational services, the overall level of restrictiveness is interpreted as a proxy for a country's general openness to service trade. The STRI provides disaggregated restrictiveness scores for Modes 1, 3, and 4, but excludes Mode 2, given that most countries impose minimal restrictions on consumption abroad. Due to data availability, STRI scores are used for 2008 and 2016, and the study period is accordingly divided into two intervals. The TiSMoS and STRI datasets are merged for 55 countries with high-quality data for analysis.

2.7 Control Variables

To isolate the effect of policy barriers, the model incorporates a set of control variables reflecting economic and sociodemographic characteristics that may influence educational service imports under Mode 3:

Economic Size (GDP): Measured as the natural logarithm of a country's Gross Domestic Product (in constant USD), this variable captures the scale of economic activity. A larger economic size typically correlates with higher demand for advanced educational services, including from foreign providers [32].

(2) Economic Growth Prospects (GDPgr): Represented by the annual GDP growth rate, this variable reflects a country's economic momentum. Stronger growth may boost household income expectations and investment in education, although in some contexts, improved domestic opportunities may reduce the incentive for seeking foreign educational services [32].

Population Size (Pop): This variable, expressed as the natural logarithm of total population, reflects the potential market size for educational services. All else being equal, a larger population suggests greater aggregate demand for education. Social Stability (Pea): Measured by the Global Peace Index (compiled by The Economist Intelligence Unit), this composite indicator includes the prevalence of violence, internal conflict, and organized crime. Higher levels of peace and stability are conducive to attracting foreign educational institutions and promoting Mode 3 trade flows [33]. Data for GDP, GDP growth, and population are sourced from the World Bank World Development Indicators.

2.8 Descriptive Analysis

The time frame for this study spans from 2008 to 2017, during which data from various sources were harmonized, covering 55 countries with a total of 550 observations. Table 1 presents the descriptive statistics for the key variables.

| Table 1 Descriptive Statistics of Main Variables | | | | | | | | |
|--|---|------|--------|-------|---------|--------|--|--|
| Variable | Variable description | Obs. | Mean | S.d. | Min | Max | | |
| lnIMP_M3 _{it} | Import value of education service in mode 3 | 550 | 1.979 | 3.352 | -4.605 | 8.028 | | |
| lnSTRI _{it} | Index of service trade barriers | 550 | 3.931 | 0.158 | 3.512 | 4.403 | | |
| lnSTRI_M1 _{it} | Trade barrier index in Mode 1 | 550 | 4.061 | 0.227 | 3.176 | 4.407 | | |
| lnSTRI_M3 _{it} | Trade barrier index in Mode 3 | 550 | 3.883 | 0.182 | 3.245 | 4.458 | | |
| lnSTRI_M4 _{it} | Trade barrier index in Mode 4 | 550 | 4.088 | 0.273 | 3.219 | 4.605 | | |
| lnGDP _{it} | Gross Domestic Product | 550 | 26.655 | 1.393 | 24.245 | 30.571 | | |
| $GDPgr_{it}$ | GDP growth rate | 550 | 2.813 | 3.563 | -15.136 | 24.370 | | |
| lnPop _{it} | Total population | 550 | 17.310 | 1.444 | 14.790 | 21.057 | | |
| Pea _{it} | Peace Index | 550 | 1.943 | 0.474 | 1.179 | 3.280 | | |

Note: The unit of IMP_m3_{it} is millions of dollars, the unit of Pop_{it} is 10,000, and the unit of $STRI_{it}$, $STRI_M1_{it}$, $STRI_M3_{it}$, $STRI_M4_{it}$ and Pea_{it} is 1.

Figure 1 displays the distribution of the STRI across 55 countries. More than half of these countries have services sector STRI scores concentrated between 40-45 and 45-50, with 17 and 10 countries respectively, totaling 27 countries. This indicates that the majority of these countries have a moderate level of openness in their services sectors. Among these 55 countries, only Ecuador has an STRI score below 35, representing the highest degree of openness in its services sector, while Indonesia and the Philippines have the highest level of restrictions on their services sectors, exceeding 65 points.



Figure 1 Distribution of the STRI Index

The World Bank classifies these countries into three groups based on their income levels: 28 high-income countries, 15 upper-middle-income countries, and 12 lower-middle-income countries. As shown in Figure 2, overall, there is a positive correlation between the level of income and the degree of openness in the services sector. Wealthier countries generally have a comparative advantage in many areas of service trade, thus exhibiting a more open attitude towards service trade. In contrast, lower-income countries, concerned about the impact of foreign enterprises on their domestic services industries, maintain a more cautious stance toward opening their service sectors. When broken down by the three different modes of service supply, Mode 3, which involves foreign direct investment in services, faces the fewest restrictions, indicating that most countries are relatively more receptive to foreign direct investment. In comparison, countries are more cautious regarding services trade involving digital delivery in Mode 1 and movement of persons in Mode 4.



Figure 2 Comparison of STRI Indexes among Different Income Countries

3 EMPIRICAL RESULTS AND ANALYSIS

3.1 Benchmark Regression Analysis

This paper conducts an econometric analysis based on data from 2008 to 2017. Table 2 reports the baseline regression results regarding the impact of service trade barriers on the flow of educational services trade.

| Table 2 Benchmark Regression Results | | | | | | | | |
|--------------------------------------|--------------------------------|-------------------------|-----|-----|-----------------------|--|--|--|
| InIMP_M3 | | | | | | | | |
| Variables lnSTRI | (1) -2.1114*** (-5.8777) | (2) | (3) | (4) | (5) | | | |
| lnSTRI_M1 | | -1.0390*** (-3.7465) | | | -0.5796* (-1.7442) | | | |

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| lnSTRI_M3 | | | -1.5500*** | | -1.1134** |
|---------------------|--------------|-----------|------------|------------------------|-----------|
| lnSTRI_M4 | | | (-4.1495) | -0.5928*** | (-2.4/96) |
| InGDPnc | 3 0623*** | 3 2701*** | 3 1740*** | (-4.1101) 3 0630*** | 3 101/*** |
| inGDFpc | (13 1206) | (13 9436) | (13 4646) | (12 7166) | (135545) |
| GDPgr | -0.0141** | -0.0134** | -0.0123* | -0.0096 | -0.0138** |
| C | (-2.2779) | (-2.1148) | (-1.9627) | (-1.5336) | (-2.1888) |
| lnpop | 3.6339*** | 4.2095*** | 3.8566*** | 4.3496*** | 3.8714*** |
| | (7.4925) | (8.8147) | (7.7881) | (9.2364) | (7.8331) |
| Pea | 0.9725*** | 0.9358*** | 0.9934*** | 0.7677^{***} | 0.9923*** |
| | (5.6386) | (5.3223) | (5.6203) | (4.3397) | (5.6255) |
| Ν | 550 | 550 | 550 | 550 | 550 |
| adj. R ² | 0.509 | 0.489 | 0.492 | 0.492 | 0.494 |
| NI-44 | -4-4:-4: : : | **** | - < 0.1 ** | - 0.05 *** - < | 0.01 |

Note: t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

Column (1) of Table 2 presents the baseline regression results. The coefficient of the core explanatory variable—the policy barrier restrictiveness index—is significantly negative at the 1% significance level, indicating that lower policy restrictiveness is associated with higher openness to educational services trade. This finding supports the notion that policy barriers in the service sector impede countries from receiving foreign educational services, particularly under Mode 3, which involves the commercial presence of foreign institutions.

To further explore the heterogeneity across different modes of delivery, Columns (2) through (4) of Table 2 report the effects of policy barriers under Modes 1 (cross-border supply), 3 (commercial presence), and 4 (presence of natural persons), respectively. All coefficients are significantly negative at the 1% level, suggesting that policy barriers across these three modes restrict the international operations of educational institutions. Among them, the restrictive effect under Mode 3 is the strongest, followed by Mode 1, while Mode 4 exhibits the weakest effect. These results indicate that while educational institutions are primarily affected by barriers related to commercial establishment (Mode 3), restrictions on remote teaching (Mode 1) and personnel mobility (Mode 4) also exert non-negligible inhibitory effects.

Column (5) introduces an interaction term between the Mode 1 and Mode 3 policy indices to examine their combined impact. The results indicate that barriers under both modes jointly inhibit the international engagement of educational institutions. This suggests that the relationship between these two modes is complementary rather than substitutive. In other words, institutions do not merely choose between delivering services via physical presence (Mode 3) or cross-border virtual means (Mode 1); instead, they tend to adopt multi-modal strategies to serve foreign markets effectively.

Collectively, these findings validate the core proposition of this study: Policy barriers under Mode 3 significantly reduce the cross-border activities of educational institutions; Barriers under Modes 1 and 4 also inhibit the flow of educational services delivered through commercial presence; There exists a complementary relationship between Modes 1 and 3, highlighting the integrated nature of international educational service provision.

3.2 Robustness Check : System GMM Estimation

The baseline regression employs a static panel model. To account for potential dynamic effects, a first-order lag of the dependent variable is introduced into the baseline regression model. The dynamic panel model is specified as follows:

$$IMP_M3_{it} = \alpha_0 + \alpha_1 IMP_M3_{i,t-1} + \beta STRI_{it} + 2'_{it}\gamma + \varphi_i + \varphi_t + \varepsilon_{it}$$
(3)

 $IMP_M3_{it} = \alpha + \alpha_1 IMP_M3_{i,t-1} + \beta_1 STRI_M1_{it} + \beta_2 STRI_M3_{it} + Z'_{it}\gamma + \varphi_i + \varphi_t + \varepsilon_{it}$ (4) The term IMP_M3_{i,t-1} represents the first-order lag of trade in educational services under Mode 3. To address the issue of endogeneity, we employ the Generalized Method of Moments (GMM) to estimate equations (12) and (13). GMM constructs equations based on moment conditions, without requiring assumptions about the distribution of variables or knowledge of the distribution of random disturbances, effectively solving endogeneity problems. We utilize the System GMM (SYS-GMM) model to examine the relationship between trade barriers and foreign investment in educational services. The estimation results are presented in Table 3.

To ensure the reliability of the System GMM results, we conduct the Arellano-Bond test for serial correlation and the Sargan test for instrument validity. The AR(2) test shows no evidence of second-order serial correlation (p > 0.1), and the Sargan test confirms the validity of the instruments (p > 0.1). These results indicate that the model satisfies key identification assumptions and that the GMM estimates are consistent.

The System GMM results confirm the baseline findings: overall service trade barriers, as well as barriers under Modes 1, 3, and 4, significantly hinder the establishment of overseas educational branches. Additionally, the complementary relationship between Mode 1 and Mode 3 is supported, reinforcing Hypotheses 1, 2, and 3.

| Table 3 SYS-GMM Regression Results | | | | | | | |
|------------------------------------|-----|-----|-----|-----|-----|--|--|
| lnIMP_M3 | | | | | | | |
| Variables | (1) | (2) | (3) | (4) | (5) | | |

| L1.lnIMP_M3 | 0.8730*** | 0.8826*** | 0.7108 *** | 0.4409*** | 0.7806*** | | |
|---|------------|-----------|------------|-------------|-----------|--|--|
| | (134.79) | (42.87) | (60.15) | (23.08) | (76.89) | | |
| lnSTRI | -0.1444*** | | | | | | |
| | (-5.71) | | | | | | |
| lnSTRI_M1 | | -0.0656* | | | -0.4218** | | |
| | | (-1.88) | | | (-2.86) | | |
| lnSTRI_M3 | | | -0.6541*** | | -0.1003** | | |
| | | | (-8.52) | | (-2.64) | | |
| lnSTRI_M4 | | | | -0.7735 *** | | | |
| | | | | (-22.73) | | | |
| Controls | Yes | Yes | Yes | Yes | Yes | | |
| AR (1) | 0.0052 | 0.0052 | 0.0052 | 0.0051 | 0.0052 | | |
| AR (2) | 0.1431 | 0.1713 | 0.1389 | 0.1324 | 0.1306 | | |
| Sargan Test | 1 | 1 | 1 | 1 | 0.8119 | | |
| Ν | 495 | 495 | 495 | 495 | 495 | | |
| <i>Note.</i> t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ | | | | | | | |

3.3 Heterogeneity Analysis by Income Group

The World Bank classifies countries into four income groups: high, upper-middle, lower-middle, and low income. Based on data availability, this study includes 55 countries across three groups—28 high-income, 15 upper-middle-income, and 12 lower-middle-income countries—excluding low-income countries due to missing data. Grouped regression results reveal heterogeneous effects of policy barriers across income levels.

In high-income countries, all policy barrier coefficients are negative and significant, indicating that restrictions under Modes 1, 3, and 4 hinder foreign educational institutions' operations. Moreover, the interaction between Modes 1 and 3 also shows a negative effect, suggesting complementarity rather than substitution—institutions rely on multiple modes simultaneously rather than switching between them in response to rising barriers (Table 4).

| Ta | Table 4 Regression Results for High-Income Group | | | | | | | |
|----------------------------|--|---------------------------------------|----------------|----------------|------------|--|--|--|
| | | | lnIMP_M3 | | | | | |
| Variables lnSTRI | (1) -2.7831*** | (2) | (3) | (4) | (5) | | | |
| | (-6.3037) | | | | | | | |
| lnSTRI_M1 | | -1.7457*** | | | -1.2724*** | | | |
| | | (-5.4934) | | | (-3.1222) | | | |
| lnSTRI_M3 | | | -2.3603*** | | -1.1404* | | | |
| | | | (-4.8256) | | (-1.8410) | | | |
| lnSTRI_M4 | | | . , | -0.9586*** | . , | | | |
| | | | | (-3.9575) | | | | |
| Controls | Yes | Yes | Yes | Yes | Yes | | | |
| Ν | 280 | 280 | 280 | 280 | 280 | | | |
| adj. <i>R</i> ² | 0.355 | 0.333 | 0.316 | 0.296 | 0.340 | | | |
| Notat | atatistics in . | • • • • • • • • • • • • • • • • • • • | m < 0.1 ** m < | < 0.05 *** m < | 0.01 | | | |

Note: t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

For upper-middle-income countries, the overall policy barrier coefficient is positive, driven by a significantly positive coefficient for Mode 1, while the coefficients for Modes 3 and 4 are negative. This indicates that while barriers to direct investment and personnel mobility hinder foreign educational institutions, restrictions on online education (Mode 1) are associated with increased foreign institutional activity. This paradox may reflect strategic adaptation, whereby foreign institutions respond to online delivery restrictions by establishing a physical presence via direct investment, thereby bypassing Mode 1 limitations (Table 5).

 Table 5 Regression Results for Upper Middle Income Group

| | lnIMP_M3 | | | | | | | |
|---------------------|----------------------------|-----|-----|-----|-----|--|--|--|
| Variables lnSTRI | (1) 1.8619* (1.7029) | (2) | (3) | (4) | (5) | | | |

| lnSTRI_M1 | | 2.9966*** | | | 3.5326*** |
|------------|-----------------|-----------------|------------------|------------------------------|---------------------|
| lnSTRI_M3 | | (3.68/9) | -1.9679* | | (3.1856) -0.9654 |
| | | | (-1.9107) | 0 1 40 1 | (-0.7119) |
| lnSI RI_M4 | | | | -0.1491 (-0.5397) | |
| Controls | Yes (6.0992) | Yes (5.8229) | Yes (6.0315) | (-0.3397) Yes (5.9979) | Yes (5.7286) |
| Ν | 150 | 150 | 150 | 150 | 150 |
| adj. R2 | 0.571 | 0.603 | 0.573 | 0.562 | 0.601 |
| Note: t st | atistics in n | arentheses * | $n < 0.1^{**} n$ | $< 0.05^{***}$ n | < 0.01 |

For lower-middle-income countries, the regression results mirror those of high-income countries, with overall and mode-specific policy barriers generally inhibiting foreign educational institutions. However, the effect of Mode 1 barriers is not statistically significant, though potentially negative, suggesting a possible complementary relationship with Mode 3. Notably, social stability plays a more prominent role in this group, with a stable environment significantly enhancing the attractiveness of these countries for foreign educational investment and operations (Table 6).

 Table 6 Regression Results for Lower Middle Income Group

| | | | lnIMP_M3 | | |
|----------------------------|------------|-----------|------------|-----------|------------|
| Variables | (1) | (2) | (3) | (4) | (5) |
| lnSTRI | -3.1663*** | | | | |
| | (-4.3043) | | | | |
| lnSTRI_M1 | | -0.8216 | | | -0.5638 |
| | | (-1.1128) | | | (-0.8076) |
| lnSTRI_M3 | | | -2.3126*** | | -2.2654*** |
| | | | (-3.8843) | | (-3.7804) |
| lnSTRI_M4 | | | | -0.6705** | |
| | | | | (-2.3026) | |
| Controls | Yes | Yes | Yes | Yes | Yes |
| Ν | 120 | 120 | 120 | 120 | 120 |
| adj. <i>R</i> ² | 0.806 | 0.774 | 0.800 | 0.782 | 0.800 |
| | | | | | |

Note: t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

Based on the group regression results by income level, Figure 3 is constructed with the horizontal axis representing the STRI under Mode 1 and the vertical axis representing Mode 3 educational service trade flows. For high-income and lower-middle-income countries, the regression lines slope downward, indicating that higher Mode 1 barriers suppress Mode 3 trade flows—suggesting a complementary relationship. In contrast, for upper-middle-income countries, the regression line slopes upward, implying that increased Mode 1 barriers correspond to greater Mode 3 trade flows, indicating a substitutive relationship between the two modes.



Figure 3 Regression coefficients for different income groups

4 CONCLUSION AND DISCUSSION

This study demonstrates that policy barriers under Mode 3 significantly hinder the establishment and operation of overseas educational campuses. Restrictions under Modes 1 and 4 also negatively affect Mode 3 trade, indicating that foreign institutions face constraints not only from direct investment regulations but also from limits on online communication and personnel mobility. Empirically, Modes 1 and 3 tend to be complementary, suggesting that online education supplements rather than substitutes traditional in-person education in international markets.

The impact of policy barriers varies by national income level. In high-income and lower-middle-income countries, barriers across all modes suppress Mode 3 activities, with stronger effects observed in high-income nations. Conversely, upper-middle-income countries display a distinct pattern: while Mode 3 barriers restrict foreign presence, Mode 1 barriers appear to encourage Mode 3 trade, implying a substitutive relationship where institutions shift between modes to navigate regulatory environments.

This heterogeneity reflects differing stages in global service trade development. High-income countries, with service sector advantages, generally promote liberalized trade. Developing countries maintain higher barriers to protect domestic industries. Upper-middle-income countries—such as Malaysia, Qatar, and the UAE—balance protectionism with efforts to attract quality foreign educational resources via direct investment, despite restricting online education. Institutions respond by leveraging Mode 3 to bypass online service barriers.

Policy implications are clear: reducing Mode 3 barriers can attract more foreign direct investment in education. In high-income and lower-middle-income countries, easing restrictions in one mode benefits others due to complementarity; for example, facilitating cross-border communication (Mode 1) supports overseas campus operations (Mode 3). In upper-middle-income countries, however, reducing Mode 1 barriers may boost online trade but reduce physical campus investment, reflecting a trade-off between modes.

For educational institutions, lowered investment barriers ease global expansion. In upper-middle-income countries, restrictions on online education incentivize establishing branch campuses. In contrast, in countries where Modes 1 and 3 complement each other, barriers in any mode amplify operational difficulties.

For students, increased trade protectionism risks reducing overseas campus availability and study options. In high- and lower-middle-income countries, barriers across modes limit both online and offline opportunities, making traditional study abroad (Mode 2) more dominant. In upper-middle-income countries, constraints in one mode may be offset by opportunities in another.

This study advances the literature on service trade modes by focusing on educational services but is limited by data availability up to 2017. Future research could update the analysis with recent data and extend to other service sectors to further validate these findings.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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