

# Student Research Participation in South Korea

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## ABSTRACT


In South Korea, government regulations constrain the resources of higher (tertiary) education, especially non-STEM (science, technology, engineering, and mathematics) departments. Resource constraints, in turn, reinforce a culturally Confucian hierarchy that restricts the participation of lower-rank members (e.g., high school and undergraduate students). This more-regulated, formal-education sector does not reflect the increasingly diverse cultural preferences (e.g., utilitarian and expressive) of Korean students. Many students, acting as consumers, exit to alternative sectors, including formal-educational institutions abroad and informal, private supplemental education at home, which offer more student research opportunities. This article develops and illustrates three theoretical propositions with relevant literature and secondary data as well as participant observations and interviews with Korea-based students. Arguably, our propositions and findings are relevant to other countries with gaps between formal education and consumer preferences and with consumer exit options.

**M**inimal literature exists on student research participation in South Korea and in most countries outside of the traditional “West” (i.e., North America, Europe, and Australasia). Our exploratory study in Korea finds that government regulations constrain the resources of higher (tertiary) education, especially non-STEM (science, technology, engineering, and mathematics) departments. Resource constraints, in turn, reinforce a culturally Confucian hierarchy that restricts lower-rank members from research and publication opportunities. The highly regulated formal-education (formal-ed)

sector does not reflect the increasingly diverse preferences of Korean students. Many exit to alternative sectors, including formal-ed abroad and informal, private supplemental education (PSE) at home. We conceptualize participation in PSE as a partial, bounded exit (Yi, Bahk, and Jon 2022), which retains legal-financial ties with the incumbent sector (i.e., domestic formal-ed).

We generalized our findings through the following three theoretical propositions: (1) organizations with more resources offer more research participation opportunities to diverse students than organizations with fewer resources; (2) a more-regulated institutional sector, which limits the supply and resources of providers, reflects diverse consumer preferences less than a less-regulated sector; and (3) dissatisfied consumers exit to the sector that offers the greatest net benefit (i.e., benefits minus costs); for many consumers, the net benefit of a partial, bounded exit is greater than that of a complete exit.

We developed and illustrated our claims with relevant literature and secondary data; the participant observations of this article’s authors; communications with a university lecturer (nontenured); detailed interviews of five undergraduate

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students in Korea (July 20 to August 1, 2022)<sup>1</sup>; and a supplemental survey of seven undergraduate and 10 master's graduate students (November 25 to December 5, 2022).<sup>2</sup>

#### MULTIPLE TRADITIONS AND RESEARCH PARTICIPATION

South Koreans are influenced by multiple cultural–religious traditions, including Confucianism, liberal individualism, and Chris-

To increase resources, Korean universities seek more tuition-paying students and government grants. The most-resourced and prestigious are large, research-oriented universities with one or more branch campuses: the main campus in Seoul typically houses 20,000 to 30,000 students (one third of whom are graduate students) and branch campuses outside of Seoul each house 10,000 to 20,000 students. Professors have limited resources (i.e., money and

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tianity (Inglehart 2006). Confucian ideals include filial loyalty to family and nation, moral standards, and social equity (Kim, Kang, and Yun 2012). Individualism includes two dimensions: utilitarian and expressive (Bellah et al. 1996, 32–33). Utilitarian individuals maximize their material self-interests; expressive individuals nurture and express their emotions, identities, and values (not directly related to material gains). Finally, Korea is a center of conservative and evangelical Protestantism. Although only 18% of Koreans adhere to Protestantism, Korean Protestants operate 77,000 Protestant churches (i.e., one church for every 660 Koreans) (Yi et al. 2018) as well as many private and international K–12 schools and PSE academies.

This milieu of multiple traditions generates diverse consumer preferences and provider options on student research. Korea's formal-ed sector largely adheres to a Confucian-influenced age and rank hierarchy, from younger (junior) to older (senior) students and from nontenured to tenured instructors. In a university research team, the hierarchy sequence is junior (master's program) graduate students, senior doctoral students, nontenured doctoral holders (postdocs and assistant professors), and tenured senior professor. Junior graduate students perform low-level tasks (e.g., collecting data) that do not merit authorship. Undergraduate students must wait until graduate school to join a research team.

However, some lower-rank students and their families, acting as consumers, seek immediate opportunities to research and author papers, preferably in international, English-language journals. Authorship generates material economic gains, such as admission to a top-tier university abroad (i.e., utilitarian); it also is a venue for students to develop and express their feelings, identities, and values (i.e., expressive). In a recent 10-year period, Korean high school students coauthored 794 international journal articles (Zastrow 2019).

These utilitarian and expressive preferences often are neglected by a formal, higher-education (higher-ed) sector, the major rules and stakeholders (e.g., government officials and tenured professors) of which reflect Confucian notions of equity and hierarchy. The government strictly regulates tuition to equalize access to tertiary education (Lee, Kim, and Lee 2020). The tuition cap restricts provider supply by excluding expensive, US-style “liberal-arts” colleges that recruit high-tuition-paying students and subsidize highly talented students. It also limits the resources of university departments, particularly humanities and social sciences, which receive fewer government grants than STEM departments.

time) and many students, and the resource constraint is more severe among non-STEM professors, whose publications and grants are fewer and less than those of STEM professors.

In Korea, applied sciences (e.g., engineering) professors annually publish, per capita, 10.50 international Science Citation Index (SCI)-level articles; pure sciences professors, 7.50 articles; social sciences, 1.46 articles; and humanities, 0.68 articles (Shin 2011). Professors receive a monetary bonus for each article, but it is reduced by the number of coauthors. The resource constraint reinforces a Confucian hierarchy, which prioritizes higher-rank members who have patiently worked their way up the ladder. When time and money are scarce, professors concentrate them—in the form of direct research collaboration and authorship credit—to senior members (e.g., doctoral students and postdocs).

Quantitative data on undergraduate researchers are not available; however, the literature and our informants suggest a small number, concentrated in STEM; the number of undergraduate-authored articles is even smaller. “It is very unusual for an undergraduate student's thesis to be published in an excellent academic journal” (Handong Global University 2017). More-resourced universities (e.g., Seoul National University) and departments (e.g., engineering) are the first to invite, and sometimes fund, undergraduate students to join a professor's research team. Undergraduate students are the lowest-ranked members of the research team who are assigned the most menial chores and have the fewest authorship opportunities. Less-resourced universities and departments (e.g., political science) lack these initiatives.

Professors rarely supervise the research of undergraduate students. Supervision of high school student research is even rarer, and such collaboration is considered problematic. Professors who supervise and coauthor with high school students allegedly are motivated by the wealth and social connections of their families. Many senior professors and government officials assume that “high school students cannot be involved in research seriously” and that such “publication achievement can be misused for [university] admission” (Zastrow 2019).

In 2019, the Korean Ministry of Education investigated allegations that some high school students fraudulently coauthored journal articles with professors. It reviewed 549 (of 794 total) faculty publications with young coauthors in the past decade and found that 24 papers had unjustified authorship or insignificant participation from young authors (Zastrow 2019). The ministry declared that these students would have their university admission revoked. At Sungkyunkwan University (Seoul), one academic reportedly was dismissed and another was reprimanded.

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Although only 4% of reviewed publications (24 of 549) showed unjustified coauthorship, the highly publicized investigation reinforced public sentiments that only children from privileged families coauthored with professors. Thenceforth, universities

As the lowest-rank member, Student C ran errands for higher-rank members. Status hierarchy was deeply embedded in the lab culture, with “people from above passing down tasks to the lower-ranking people,” and “oppression (갑질)” and “emotional

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(including this article’s first author) strictly warned professors against coauthoring with high school students.

#### STUDENT NARRATIVES

Academically motivated students preferred top-tier Seoul universities to lower-tier provincial institutions because the latter lacked motivated students (stated Student C) and quality research programs (stated Students C, D, and E). Student E stated that if she were at a low-tier Korean university, she would try to contact a professor in a “good” (i.e., Seoul-based) university to gain research experience.

Nevertheless, even at top Korean universities, student narratives illustrated the paucity of undergraduate and even graduate student research. Student A (political science) was interested in researching with a professor but could not find information on how to do so. The lack of information was worsened by the absence of in-person classes during the pandemic (Spring 2020 to Fall 2021). Student B (political science) wrote a paper on the China–Taiwan conflict and emailed a department professor to seek further guidance. However, the professor “still hasn’t gotten back” to Student B despite three emails. Student B believed that his research “would be kind of lacking” without a professor’s supervision and he subsequently suspended the project.

Unlike Students A and B (University 1), Student C (medical science, University 2) was formally accepted to a professor’s research team as part of a newly formed undergraduate research track in his department. Student C took a module on undergraduate internship and independent research. She was one of the “two or three [undergraduate] students that take this module every year”—less than 2% of the department’s undergraduates. “I am the only one in my grade in the [research] track.”

Most undergraduate students were not interested in the optional research track. However, even those who were interested would be deterred by the high demands and hierarchy of research teams. Professors required graduate students to physically attend lab daily. In return, graduate students received funding and a lighter course load. However, undergraduate Student C received neither: “I was taking the internship module while undertaking my regular studies at the same time, so it was impossible for me to invest all my time and attention in the research, but I felt that the lab staff and senior faculty often required too much and showed little consideration for undergraduate students’ situations.”

bullying” were clearly present. “There is a culture of having to follow all of the orders from above and if a person from above does not like you, things will not go smoothly for you....The professor is treated like a divine being...with absolute rights, absolute authority.” On the positive side, “I learned what graduate school is like, how graduate school works, how the research process works, and how to apply the experiments and biological knowledge I learned during my regular classes.”

Student C described the typical research hierarchy in Korea, but student D (political science, University 3) found an atypical, more egalitarian research setting. “The professor likes giving [undergraduate] students many different chances and research experiences, and the professor asked if I would consider participating in their research, so I decided to join.” Eight students participated in the professor’s research project and three received supervision for their own projects; Student D did both types of research. The professor always offered advice and was flexible with work arrangements and deadlines.

Student E (social science and computer science) was a rising second-year student at a US Ivy League university who had transferred after one semester in Seoul (University 3). The Ivy League university promoted a culture of undergraduate research with professors. Student E estimated that half of her undergraduate friends, mostly in the sciences, participated: “[My] professor was very flexible with dates and work, and it was very comfortable doing the research from home with online tools—for example, Zoom meetings or online meetings. Also, it was great that the professor was very precise with what I needed to do and gave me a lot of advice, like one-on-one mentoring.” Unlike Students C and D in Korea, Student E was offered coauthorship for her research participation.

The lack of research opportunities in Korean universities also extended to graduate students. Student B stated that he was unwilling to attend graduate school in Korea because his friends in graduate school said that “the professors are very close-minded and they kind of push stuff onto you.” Professors demand menial tasks (e.g., data tabulation, photocopying, and translations) but do not help students to author papers for journals appropriate to their interests and skill levels.

A supplemental survey of seven undergraduate and 10 graduate students generally supported the interview narratives and offered a broader and international context. Korean undergraduate students and exchange students from Europe and Brazil generally

lacked research-publication experience, although some were interested. As one Korean undergraduate (Student 6, University 1, political science, male) stated: “Currently, I do not have any experiences in student research and publication. But I am willing to join a program for a research study if I have an opportunity.”

The only undergraduate respondent (Student 7, exchange student at University 1, female) to claim such experience was from a “211 Project” Chinese university, one of 100 government-funded universities for scientific research. “My home university—especially my department (humanities and social sciences)—galvanizes us into doing research, while professors and the laboratory will cultivate students systematically, ensuring everyone has the awareness of doing academic research...and publish papers [in domestic or international journals].” Student 7 received 2,700 renminbi (yuan) (US\$388) in funding for a small program platform on the Chinese messaging app WeChat.

Among graduate students in Seoul, STEM departments offered higher standards and assistance for research publications than non-STEM departments.<sup>3</sup> Publication was noticeably lacking for junior graduate (MA candidate) students in non-STEM departments (e.g., political science) because, like most undergraduate students, most simply wanted a degree “and not much else” (Graduate 1). Moreover, “some professors were actively publishing, but no one ever offered us to publish or their support to review our extra projects in the class” (Graduate 2). At least initially, most non-STEM, MA-candidate students were not interested in research publication, and most professors did not encourage their interest. Professors focused on lecturing “theoretical knowledge” rather than practical research methods (e.g., experiments) (Graduate 3).

#### SOUTH KOREA AND THE UNITED STATES

In Korea, higher-ed options were limited to large research universities (prestigious) or small teaching universities (less prestigious). The former were similar to US flagship state universities (e.g., the University of California) with many undergraduate and graduate students. The latter were akin to US teaching-oriented, second-tier state universities with minimal research and few doctoral students. In large research universities, whether Korea- or US-based, professors were burdened with publishing papers and supervising numerous graduate students, with less time available to supervise undergraduate students. Shin (2011) reported that in Korean universities and especially among junior faculty members, international journal publication was correlated negatively with undergraduate teaching quality. A colleague of this article’s first author shared his welcoming attitude to undergraduate research; however, as a junior social science professor at a large research university in Korea (University 4), she lacked the time to supervise undergraduate research.

The US tertiary sector offered a robust third option: “liberal arts” colleges that are focused on undergraduate teaching and research, whether alone (e.g., Williams College) or within large research universities (e.g., Yale University). Evangelical colleges (e.g., Westmont College) also promoted student research, and Korea typically was their top source of international students.<sup>4</sup> Almost half of public four-year colleges and universities offered “honors” colleges or programs to attract high-achieving students (Pugatch and Thompson 2022), and both private and public institutions hosted student-run journals that published undergraduate research. Even less-resourced, second-tier universities expended funds to help talented

undergraduate students research and publish papers in appropriate journals,<sup>5</sup> and some professors even supervised high school students (Parker-Pope 2013).

The two closest Korean equivalents to a US-style liberal arts education, with close collaboration between professors and undergraduate students, were Handong Global University (established 1995), an evangelical four-year university in Pohang, and Seoul-based Sungkonghoe University (established 1914). At Handong, two undergraduate students first-authored a SCI-level publication, a “very unusual” event (Handong Global University 2017). Nevertheless, their supervising professor (and secondary author) was in the engineering department, which generated the most grants and publications. Social science professors at Handong also invited undergraduate students but rarely (if ever) offered authorship credit.<sup>6</sup>

There were no Korean universities that offered a US-style honors college or program for talented students: “It’s against the popular sentiment among Korean students/parents that the universities offer an exclusive program for those honors students.”<sup>7</sup> That is, undergraduate students should receive equal opportunity: either they all benefit from an honors program or no one does. Our informants also were not aware of any undergraduate research journal in Korea, except for the defunct *Yonsei European Studies* (established 2012).

#### EXIT OPTIONS

Using the Hirschman (1970)-inspired Exit, Voice, Loyalty, Neglect framework, three students voiced dissatisfaction with opportunities to research with professors in Korean universities either because such opportunities were lacking (Students A and B) or the research team limited the undergraduates’ meaningful participation (Student C). However, their voices remained anonymous and were directed to this article’s authors; they did not complain openly to their professors and were skeptical that the system will change (*neglect*).

Student C, a STEM major in perhaps the highest-ranked university in Korea, found few peers who were interested in research. She cited a hierarchical environment, with high costs but few benefits (i.e., money and authorship) for undergraduate researchers. For Student C, costs included both time and conformity to a Confucian hierarchy that prized rank and deference.

However, another reason—not cited by Student C—was that many students interested in research already had exited Korea’s higher-ed system. Korea sent abroad the most numbers of students per capita: in 2015, 100,011 and 33,167 Koreans, respectively, studied abroad in undergraduate and graduate programs (Kim 2017). The numbers reflected the huge public demand: 55% of Korean parents wanted their children to study abroad. Their most-cited reasons, which reflected a mix of utilitarian and expressive values (Kim 2017), were “for nurturing an international/cosmopolitan perspective” (42%), “for my children’s talents (in case of arts and music)” (26%), and “because of an unsatisfying [domestic] education system” (19%).

However, most families lack the resources (e.g., income and scholarships) for their high-school and college-age students to completely exit Korea’s formal-ed sector. Without financial aid, the net benefit of attending an institution abroad (especially if it is not top tier) or its local branch at home (e.g., SUNY–Korea) often is lower than that of attending a domestic institution. More affordable

(i.e., greater net benefit) are various bounded-exit options (Yi, Bahk, and Jon 2022): students officially register and pay tuition to incumbent providers (i.e., domestic high schools and universities) but participate in alternative providers that supplement—not supplant—the former. One bounded-exit option is a temporary exchange program, in which a student pays home-campus tuition but attends an institution abroad for one or two semesters. However, openings in exchange programs, especially for desired US/UK colleges, remain limited and highly competitive for Korean students. More accessible options are PSE and online courses.

By per capita participation and spending, Korea hosts the world's largest PSE sector. Its popularity increased during the COVID-19 pandemic because PSE academies offered in-person and synchronous instruction, which many K–12 public schools and universities declined to do (Yi, Bahk, and Jon 2022). Korea also is a global leader in information technology and social media (Yi and Jung 2019). The PSE and social media sectors are less regulated than the formal-ed sector; for instance, the government does not cap the tuition of PSE organizations or subscription fees for social media channels. This allows for many more providers, with varying prices and research assistance, than the formal-ed sector.

PSE organizations offered expert supervision for publishing journal articles, in various genres, for all academic ranks from high school to graduate students. A blog advertised a PSE organization's statistics in tutoring and testimonials from students who published in domestic Korean Journal Database (KCI-level) and international (SCI-level) journals (Parbo 2019). An education news site (Kim 2021) advertised the top-ranked thesis consulting company, Knowledge Pen, and its low-cost, winter-vacation, small-group tutoring program for writing individual theses: January 4–February 28, 2022, 4 hours a week, three to five students per group. “Through this program, Knowledge Pen will conduct intensive education to create researchers who can write a high-quality research plan, systematically read and organize prior research, complete a new and important research model, and complete a systematic and scientific data-collection design.”

PSE courses for KCI- and SCI-level research technically was open to all ranks but focused on graduate students. PSE advertisements for high school students focused on prestigious, high school student research journals (e.g., International Social Science

focused on STEM or the pure sciences, so those who want to focus on social sciences like economics and politics are struggling where to submit. Today we will introduce journals and opportunities to students who completed research in social science.” The PSE sector provided teachers who were paid directly by students and who catered to their diverse preferences.

Even less costly (or free) were online lectures, blogs, and other Internet content on academic research and publishing. Reliable data are not available, but one keyword search found more than 1,000 Korean-language sites and 30 YouTube channels. This included PSEs and professional tutors (e.g., Dream Sherpa 2020; Kim 2021) and current and former doctoral students (Choi 2020).<sup>8</sup> In addition to detailed steps and advice, they mentioned the material benefits and costs (i.e., time and money) of professional research projects (*utilitarian*) and the “meaningful” opportunity to share one's work and thoughts with others (*expressive*). Social media's mix of utilitarian and expressive discourses on research publication were similar to that on studying overseas (Yi and Jung 2019).

Analysis of PSE and social media content suggests a U-shaped market focused more on low-rank (high school) and high-rank (graduate) students and less on mid-rank (undergraduate) students. That is, research publications help ambitious high schoolers to gain admission to top-tier universities, mostly overseas; junior graduate students to top-tier doctoral programs; and senior graduate students to tenure-track or other research-related employment. Historically, undergraduate students applied for a master's degree in Korea *before* applying to overseas doctoral programs, and research publications were not required (or expected) to enter a master's program. In the future, if more undergraduates apply directly to overseas doctoral programs, they may become interested in research publications. Furthermore, more undergraduates may embrace professional research as part of their personal values and identity (*expressive*) or if it is valued by prestigious employers (*utilitarian*). If this happens, PSE and social media will quickly adapt to changing consumer preferences.

## DISCUSSION

This exploratory analysis of student research in Korea illustrates our three propositions. Consistent with the first proposition,

*Consistent with the first proposition, more-resourced universities (in Seoul) and departments (STEM) take the initiative in integrating undergraduate (and graduate) students into professional research. Consistent with the second proposition, Korea's more-regulated higher-ed sector is dominated by a few Seoul-based, Confucian-oriented universities that respond less to student demands for research participation. Consistent with the third proposition, many dissatisfied students seek exit options, especially the bounded exits of PSE and social media, which offer many more providers with varying prices and research assistance.*

Conference for Youth). According to the Grace Institute of Research and Education (2022), a PSE organization with a distinctly Christian name: “A lot of students begin high-quality research from high school and aim for publishing and even awards. However, most publishing and awards opportunities are

more-resourced universities (in Seoul) and departments (STEM) take the initiative in integrating undergraduate (and graduate) students into professional research. Consistent with the second proposition, Korea's more-regulated higher-ed sector is dominated by a few Seoul-based, Confucian-oriented universities that

respond less to student demands for research participation. Consistent with the third proposition, many dissatisfied students seek exit options, especially the bounded exits of PSE and social media, which offer many more providers with varying prices and research assistance.

Our propositions and findings would benefit from more systematic quantitative data. They also are relevant to other countries that demonstrate gaps between formal-ed or higher-ed sectors and consumer preferences and that allow exit options. Korean policy makers may consider reforms to the higher-ed sector, such as loosening tuition caps (especially for new providers) and incentivizing professors to assist student research. However, these reforms will meet resistance and require more discussion. A less-resistant approach to increasing student research opportunities would be to strengthen existing exit options.

US higher-ed providers offer various exit options for non-US students interested in research opportunities, including full-time or temporary study abroad in the United States; local branch campuses (e.g., SUNY–Korea); and global, massive open online courses. They could broaden access to these options by increasing financial aid or by adding native-language subtitles to online courses. They also could partner with reputable local PSEs to support quality, low-cost courses for student research.<sup>9</sup>

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#### CONFLICTS OF INTEREST

The authors declare that there are no ethical issues or conflicts of interest in this research. ■

#### NOTES

- The five interviewees included Student A, a citizen of a country in Eurasia, female, 22, political science, University 1; Student B, from South America, male, 22, political science, University 1; Student C, from Korea, female, 20, medical science, University 2; and Student D, from Korea, male, 19, international law and political science, University 3. Students A–D attended prestigious top-six universities in Korea. Student E (from Korea, female, 20, social and computer science) transferred after one semester from University 3 to a US Ivy League university. This article's second author, who conducted the interviews, experienced difficulty in finding Korea-based undergraduate students who actively sought professional research, especially in the humanities and social science.
- The undergraduate students surveyed were regular or international exchange students taking a political science course in University 1; the graduate students were from various majors and from Korean universities 1, 2, and 4. All respondents were contacted via the authors' social and professional networks. The sample data do not allow statistical inferences, but—from the authors' perspectives—they broadly capture student perspectives and experiences in South Korean higher education as of 2022.
- Electrical engineering (University 1) required MA-candidate students to publish at least one KCI article and PhD candidates, two single-author SCI-level articles (worth 200 points) or their equivalents. Students received 100 points for a single-authored SCI article, 70 points for an article with two coauthors, and 50 points for three or more coauthors. In business administration (University 1), MA students wrote a thesis and were not required to publish, but PhD students were required to publish one SCI-level or two non-SCI journal articles. In political science (University 1), MA students were not required to publish; PhD students were required to publish one article in any journal.
- For Westmont College statistics, see College Factual (n.d.). At the 2022 Association for the Sociology of Religion Conference, a Westmont College undergraduate (Jang) solely presented the findings of a large-sample survey project ("Religion and Spirituality and Risk of Prevalent Hypertension among Ethnic Cohorts") with his supervising professor in the audience.

- Selected students in the California State University Long Beach Honors Program ([www.csulb.edu/university-honors](http://www.csulb.edu/university-honors)) can live in a designated residence (Honors House); study in small discussion-oriented classes; and conduct high-level research with faculty members.
- Communication with Handong Global University lecturer, August 23, 2022.
- Communication with Handong Global University lecturer, December 5, 2022.
- Korean-language keywords (논문+쓰는+법 [article+writing+method]) were searched in Google and YouTube, August 25, 2022.
- Space limitations preclude discussion of other East Asian countries. As Student 7 noted, China's top 100 universities also actively promote student research, and they are becoming low-cost, complete, or bounded-exit options for Korean students (Yi and Jung 2019). China also had a huge PSE sector (bounded exit), but a recent government crackdown on PSE has pushed more Chinese consumers (i.e., families) to permanently emigrate to other countries (i.e., complete exit) (*New Yorker*, May 16, 2022; *Sixth Tone*, July 25, 2022).

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