

Policy note on “Higher Education Financing in Vietnam: Strategic priorities and policy options”

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1. Country context and summary of recommendations

Vietnam is building its own University of the Future, with unique missions, purposes and features, and functions, which will be one of the driving forces of the national socio-economic development. Today, more than ever, education and knowledge are decisive factors, inextricably linked to the quality of growth of a nation and higher education has long been recognized as having a dialectic relationship with the level of socioeconomic development. In the course of history, each and every developed nation had a system of leading universities - at the core of its knowledge society and economy, with examples including Greece, Italy, France, Great Britain, Germany, the United States, and now Singapore, South Korea, and China. Higher education institutions are the center of knowledge production and support economic growth and socio-economic mobility by (a) producing a skilled and adaptable labor force, (b) generating new knowledge through basic and applied research, and (c) fostering innovation through the application of knowledge and technology.

In order to realize its ambition to become a high-income country and achieve greater equality and shared prosperity by 2045, Vietnam must constantly improve labor productivity, promote social development and catch up to the global technological frontier. Global and national mega trends are simultaneously posing unprecedented challenges and providing the opportunity for Vietnam to leverage its higher education system as a platform to transform the skilled, knowledge workforce, science, technology, and innovation (STI). **These goals require strong and transformative investment in Vietnam's higher education.**

Vietnam has made important strides in university autonomy and accountability and the improvement of training and research quality in recent years. The higher education access rate has increased more than twice since 2000 to reach 1.9 million students in 2020. Progress is also seen in staff qualification, for example, the share of university lecturers with master and/or Ph.D. degrees almost doubled from 47 percent in 2007 to 85 percent in 2020. As reported by the Ministry of Education and Training (MOET), the higher education autonomy reform created a healthy competitive environment in enrollment and attraction of students. Enrollment in excellent training programs and joint international programs has been growing.

Vietnam's top research-oriented universities have made progress in recent years with their global and regional rankings gradually rising. In 2022, five Vietnamese universities were named on important international university rankings, including THE rankings - the best of its kind in 2022, and the QS World University Rankings.¹ The 03 leading universities - Vietnam National University, Hanoi (VNU-HN), Vietnam National University, Ho Chi Minh City (VNU-HCM), and Hanoi University of Science and Technology (HUST) – both rose in the above rankings. In terms of research output, the number of citable documents in per capita terms has almost tripled in the past 10 years.

However, the country has also failed to seize certain opportunities to enhance equity in access to higher education, create high-quality workforce for science, engineering and technology development, and significantly boost the quality of the labor force in general. The country has exceptional high performance in the 2020 Human Capital Index (HCI) where it ranked 38 out of 174 countries and territories, up from the 48th position in 2018 and second-highest among all middle-income countries. Of the three subcomponents in the HCI, Vietnam

¹Where does Vietnam stand on the world university rankings? <https://dantri.com.vn/giao-duc-huong-nghiep/dai-hoc-viet-nam-dang-o-vi-tri-nao-tren-ban-do-xep-hang-the-gioi-20220811221149222.htm>

comes out especially strong with regard to access and quality in general education. However, Vietnam's higher education system is not ready to capitalize on this huge potential of young people coming out of general education. Access to higher education, as measured by the gross enrolment rate (GER), is below 30 percent, one of the lowest among East Asian countries. Compared with other peers regionally and globally, Vietnam is gradually losing its strengths in the supply of high-skilled human resources. Vietnam needs to invest more and soon in its higher education system if it wants to become internationally competitive by capitalizing on its younger generations.

This policy note provides recommendations on strategic priorities and policy options on financing, as a key pillar to support the transition and development of Vietnam's higher education, improving its accessibility, equity, quality, and contribution to Vietnam's growth and socio-economic development. The recommendations are based on a rapid assessment of the higher education system, projection of demand and supply for workers with higher education, cost-benefit analysis, and selected case studies of international experience. Whenever possible, we compare the proposed investment/spending levels with a set of benchmarking countries.

Our policy proposals for higher education financing are based on a view that higher education is a dynamic social contract between government, universities, households (students) – and third-party patrons, where the stakeholder's contribution is considered through the lens of social choices. A summary of our proposals is as follows.

1. Vietnam needs to update its laws, regulations, and policies to (a) ensure a clear understanding, interpretation, and implementation of financial autonomy, and (b) avoid equating financial autonomy to financial self-reliance/independence and narrowly interpreting it as the absence of government support from the state budget. Continuing this practice will exacerbate inequities in access to quality education for students from disadvantaged backgrounds, expand the intergenerational gaps when they go to the labor market, and weaken socio-economic mobility and the middle class.
2. To meet the increasing demand for a quality workforce with higher education and ensure equitable access to opportunities, Vietnam needs to increase government investment on higher education, with the proportion of the state budget spending increased to at least 0.8 – 1.0 percent of GDP in 2030 from the current base of 0.23 percent. This will provide regular and stable support to public universities; to the extent possible, incentivize the private sector to come in; and expand financial support to students through financial aids and/or loans.
3. To support universities to become strong research institutions and develop the R&D workforce, the state budget allocation to university-led research and development (R&D) should increase to at least 30 percent of the STI budget by 2026 from the existing base of 13%-18%.
4. To improve the efficiency and accountability of education spending, Vietnam needs to reform its financing mechanisms towards outcome-oriented approaches, including formula financing, performance contracts, and competitive financing.
5. To improve resource and system diversification and incentivize private services providers, Vietnam needs to revise the policy framework for public-private partnership (PPP) in education, building institutional capacity for education stakeholders and removing barriers to access to government and off-budget financing resources.

This policy note is structured into three main sections. Section 2 highlights selected outputs of Vietnam's higher education during 2010-2021 – a more comprehensive assessment and diagnosis of the system is provided in World Bank's Higher Education Report 2020. Section 3 discusses existing barriers and challenges to higher education financing and policy implications. Section 4 summarizes key policy recommendations on financing and the ways forward. Three annexes provide technical details into an exercise to forecast the demand and supply gaps of university graduates, international experience, and national initiatives.

2. Vietnam's higher education: selected outcomes during 2010-2020

2.1. Equitable access to higher education

Vietnam's transition towards a new economic paradigm emphasizing technology-intensive and knowledge-based industries is exposing universities to unprecedented opportunities and new challenges in ensuring quality and relevance to meet emerging market demand. According to the Enterprise Survey findings in recent years, at least 40% of Vietnamese business owners and employers believe they need to have more university-educated workers, which is an annual growth of about 10% on average for the next 3-5 years.

However, the country has not fully leveraged the great potential of its general education system to meet the needs of socioeconomic development (World Bank 2020). Vietnam ranks 38 out of 174 countries and territories on the World Bank's Human Capital Index (HCI) in 2020, the second-best result among middle-income countries (only behind Belarus's ranking at 36th). Despite this achievement, the higher education enrolment rate in Vietnam is one of the lowest among East Asian countries with annual enrolment in universities stagnating at around 1.5 – 1.7 million during 2010-2023. Compared with other regional and global peers, Vietnam is gradually losing its advantage in the supply of a high-skilled workforce. Vietnam's workforce with higher education ranked 75th in the Global Innovation Index (GII) in 2015 but then dropped 15 places to 90th in 2022.

Vietnam's universities are expected to produce 200,000 and 450,000 more graduates every year in addition to its projected annual graduates during 2023-2030, if, in 2030, Vietnam is about to have a labor force with 15.34 percent having higher education, similar to the average of upper-middle-income countries in 2022. This shortage is nearly equal to the projected capacity of the university system, with 350,000-450,000 students graduating annually over the same period (Figure 1). Note that the projection has assumed a highly positive scenario where university enrolment and graduation are assumed to improve consistently in the next seven years. The gaps would be much higher if the access, enrolment, and graduation rates are similar to those in the past eight years. Specifically, the number of university graduates, including public and non-public have decreased in the past eight years, from 352.8 thousand students in 2015 to 242.4 thousand students in 2020.

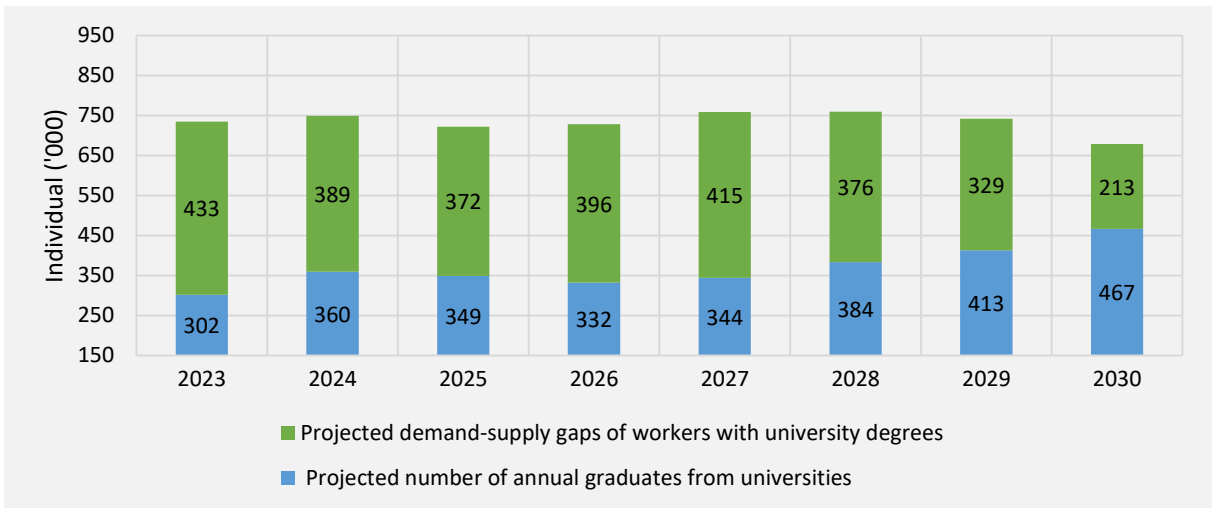


Figure 1: Projection of demand-supply gaps for new university graduates 2023-2030

Data source: World Bank projection.

The shortage of workers with a university education will be exacerbated by the absence of comprehensive financial and non-financial support for disadvantaged groups (poor and near-poor households, ethnic minorities, and people with disabilities). Nearly 80% of young adults in the top quintile have already attended universities in 2020, and the top two quintiles accounted for nearly two-thirds of all enrollments. Students from the bottom two income quintiles constitute only about 10 percent of all university students (Figure 2). If Vietnam aims at expanding university access and improving the workforce with higher education in the labor market, then the only viable option in the future would be to support students from less well-off families attending universities, and thus, having access to well-paid jobs later in life. annual enrolment in universities stagnated at around 1.5 – 1.7 million during 2010-2023.

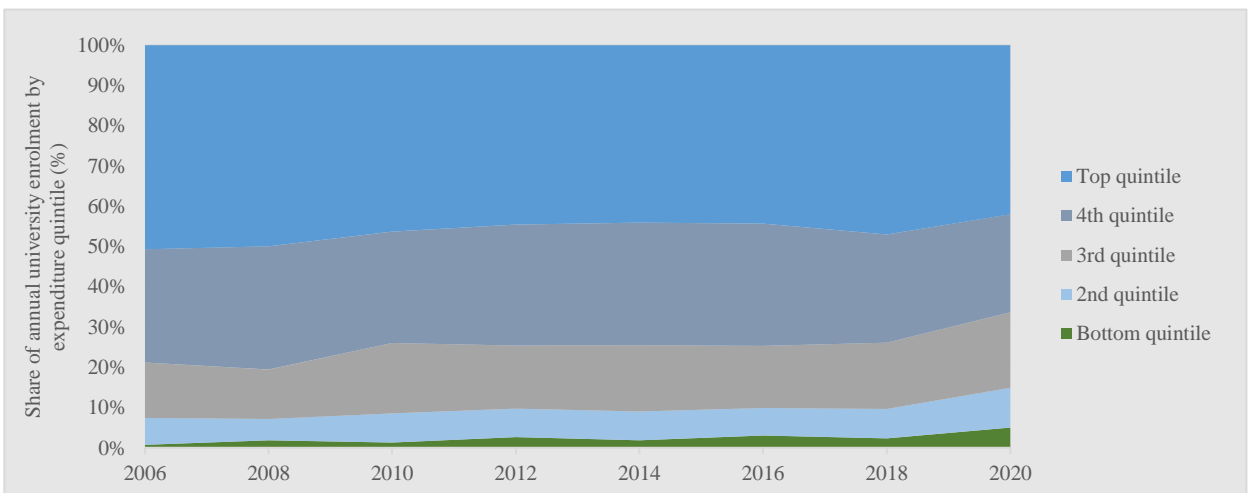


Figure 2: Share of annual university enrolment by quintile of household expenditure between 2006 and 2020

(Data source: Vietnam Household Living Standards Survey 2006-2020)

2.2. Quality and relevance of university training

Reforming traditional curricula and pedagogical practices, improving talent management at universities, and increasing investment in facilities will generate a large and positive impact on the quality and relevance of training programs. For example, in the technology-intensive industries, a significant proportion of Vietnam's university-educated workers do not have the necessary work skills to take on technical/engineer positions in high-tech industries— especially those adopting emerging but priority technologies such as biotechnology, nanotechnology, and artificial intelligence. Nearly 80% of manufacturing companies are having difficulty hiring skilled workers (Enterprise & Innovation Survey 2020) and more than 40% of employers consider employees' technical and technical skills to be quite poor or inappropriate (Vietnam Enterprise Survey 2019, Figure 3). When Vietnam transitions towards a tech-intensive economy, a highly skilled workforce, especially in Science, Technology, Engineering, and Mathematics (STEM) fields, will be fundamental and almost a prerequisite.

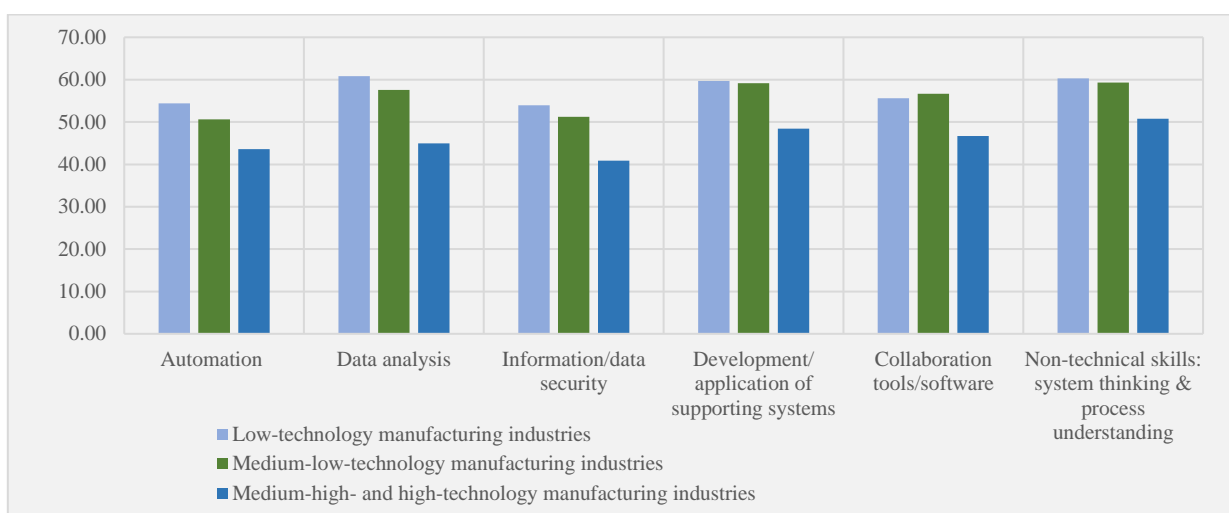


Figure 3: Proportion of employers and business owners who consider employees' skills unsatisfactory or poor in 2019

Data source: Vietnam Enterprise Census, 2019

2.3. Research, technology transfer, and innovation

Vietnam's research and technology transfer level is low compared to regional peers such as the Philippines, Indonesia, Thailand, and China. When measured by the H-index, which captures both the quality and impact of research output, Vietnam ranks below all these countries. Achievements in terms of technology transfer remain limited where, for example, Vietnam only has 1.24 patent applications per million people, less than 10% and 1% of patent applications filed in Malaysia and China respectively. Low productivity and quality of research and technology transfer are attributed to, among others, limited availability and inefficient use of financial resources, lack of talented human resources, inadequate research/IT infrastructure, and lack of linkages with global research networks.

Although the number of researchers with doctoral degrees has grown in recent years, Vietnam is yet to create a critical mass of high-quality R&D workforce². Over the past 10 years, the absolute number and proportion of the R&D workforce (full-time equivalents) – have

² R&D personnel are all persons engaged directly in R&D (such as researchers as well as those providing direct services for the R&D activities - R&D managers, administrators, technicians and clerical staff) (OECD 2015). Number of employees are converted to full-time equivalents (FTEs) using the FTE conversion factor.

remained virtually unchanged (Table 1). A related challenge is the fact that Vietnamese universities have not taken full advantage of linking with the global research frontiers, such as world-class universities and their world-class faculty, on collaborative research programs and internationalization of Ph.D. programs.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
R&D personnel (FTE) (thousand person)	67.4	79.27	71.57	73.09	67.29	68.88	60.11	66.46	72.47	75.13	71.99
Share of R&D FTE personnel in the workforce (%)	0.13	0.154	0.136	0.136	0.125	0.127	0.110	0.121	0.131	0.135	0.131

Table 1: R&D personnel in Vietnam from 2010 to 2020

Note: FTE means full-time equivalents.
Source: VISTA

3. Higher education financing: critical bottlenecks and challenges

3.1. Low state budget spending on higher education

With the lowest public spending on higher education, as a share of GDP, and the highest level of reliance on tuition fees, Vietnam is an outlier compared with its benchmarking peers. Between 2004 and 2017, the state budget allocation to the education sector was, on average, 5% of GDP, and 17 to 19%, of total public expenditure. However, within the education and training sector, the share of spending on higher education is the lowest among all segments, making up about 0.27% of GDP in 2020, 0.9% of total public expenditure, and 4.9% of total education expenditure. Compared with countries at a “desirable” level of development (aspirators) and countries at a similar level of development (comparators), Vietnam’s public spending on higher education only ranks above Laos (Figure 4).³

In Vietnam, university financial autonomy is equated to financial self-reliance with an increasing reduction of support from the state budget. An important policy shift in 2015 stipulated a mechanism for public universities to reduce dependency on state budgets and increase reliance on cost-sharing in exchange for academic autonomy and freedom. This policy has applied to a group of autonomous, research-oriented universities whose training programs are appealing to prospective students and which can charge higher tuition fees. Against that background, the financial burden has been gradually transferred to households/students and left students from disadvantaged backgrounds increasingly vulnerable and left behind.

³ As reported by MOET at the Workshop on Higher Education Autonomy in 2022, the state budget spending on higher education was only 0.25-0.27% of GDP between 2018 and 2020.

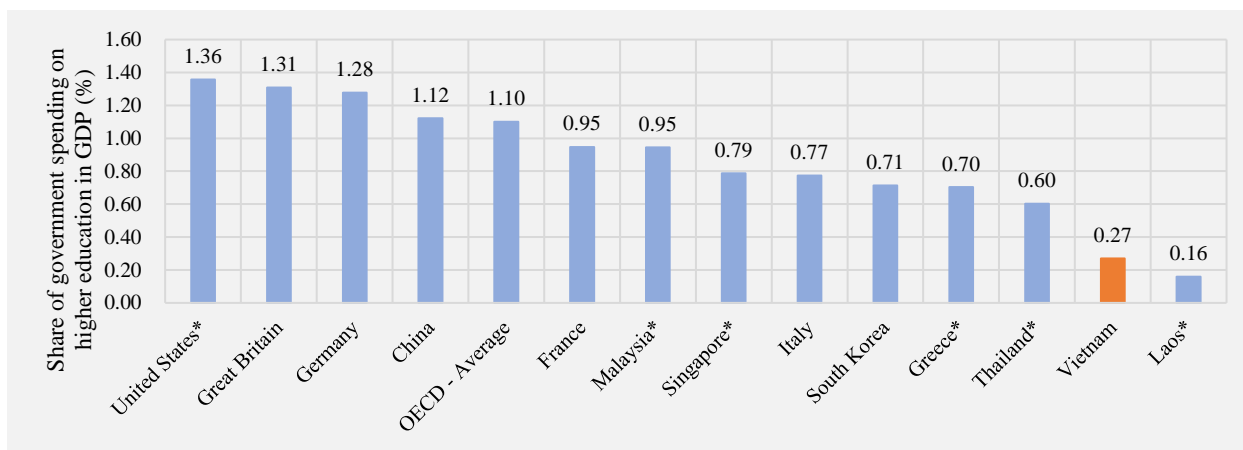


Figure 4: Government spending on higher education in GDP in 2019

Note: * Share of government spending on tertiary education in GDP. Vietnam's data is in 2020.

Data source: UIS Statistics, OECD Education at a Glance, Ministry of Education of China, National Bureau of Statistics of China, Vietnam Education Sector Analysis Report for the period 2011-2020, Ministry of Finance of Vietnam

3.2. Unsustainable cost-sharing model and risks of inaccessibility for disadvantaged students

The household contribution has steadily increased over time and now stands as the single most important source of revenues for public universities. In 2017, the state budget allocation constituted only 24 percent of the total revenues for public universities while tuition fees accounted for 57 percent of the revenue and the remaining 19 percent came from other sources, such as R&D, technology transfer, and other services (Figure 5). Four years later, the survey of public universities in 2021 indicated that household contribution rose dramatically to 77 percent and the state budget resources dropped to 9 percent of university income. This raises the alarm about the sustainability of university financing, including the increased risk of being left behind for students from financially disadvantaged backgrounds.

Current institutional scholarships and need-based loans for university students suffer from low coverage, low amount, and, unattractive terms. Vietnam does not have a nationwide scholarship program for university students. Currently, targeted tuition waivers or reductions are offered to some specific groups (Decree 81/2021/ND-CP).⁴ The government also mandates public universities to offer scholarships to at least 10 percent of their students. This is placing a financial burden on universities although universities receive tuition subsidies as partial compensation for this student's financial incentives. However, for financially disadvantaged students, tuition exemption and reductions are insufficient to offset the

4 For students currently enrolled in universities, those eligible for tuition fee exemption include: (1) ethnic students whose father or mother or both parents or grandparents (in case they live with their grandparents) are from poor and near-poor households as prescribed by the Prime Minister; (2) students directly enrolled in public HEIs under the nomination-based enrollment policy of the Government; (3) students majoring in Marxism-Leninism and Ho Chi Minh Ideology; (4) undergraduate, master's and PhD students majoring in Tuberculosis, Leprosy, Psychiatry, Forensic Assessment, Forensic Psychiatry and Pathology in public healthcare training institutions based on the task assignments of the State; (5) students from very minor ethnic groups as specified in Clause 1, Article 2 of Decree No. 57/2017/ND-CP dated May 9, 2017 of the Government on priority admission and learning support policies for preschool, general and higher education students of very minor ethnic groups living in areas with difficult or extremely difficult socio-economic conditions according to current regulations.

attendance costs – with living costs, travel, and other university contribution making up from around 50 to 67 percent of the total cost of university training.

The national student loan program, managed by the Vietnam Bank for Social Policies (VBSP), is the only available option for formal loan schemes, but its process and procedures are cumbersome and complicated and the loan amount is only enough to cover basic tuition. On the positive side, eligibility criteria for student loans by VBSP have been expanded in recent years to include disadvantaged students being enrolled in public and private universities, colleges, and vocational education institutions. However, partly due to complex procedures and unattractive repayment terms, the loan scheme coverage has gradually decreased, from 2.4 million in 2011 to 725,000 in 2017 and only 37,000 in 2021. According to the MOET’s survey of public universities in 2023, among high school students who applied to universities and faced financial hardships, less than 15% of them consider using formal student loans in case tuition fees are higher than their ability to pay while 49-50% of them chose to switch to a different major of study.

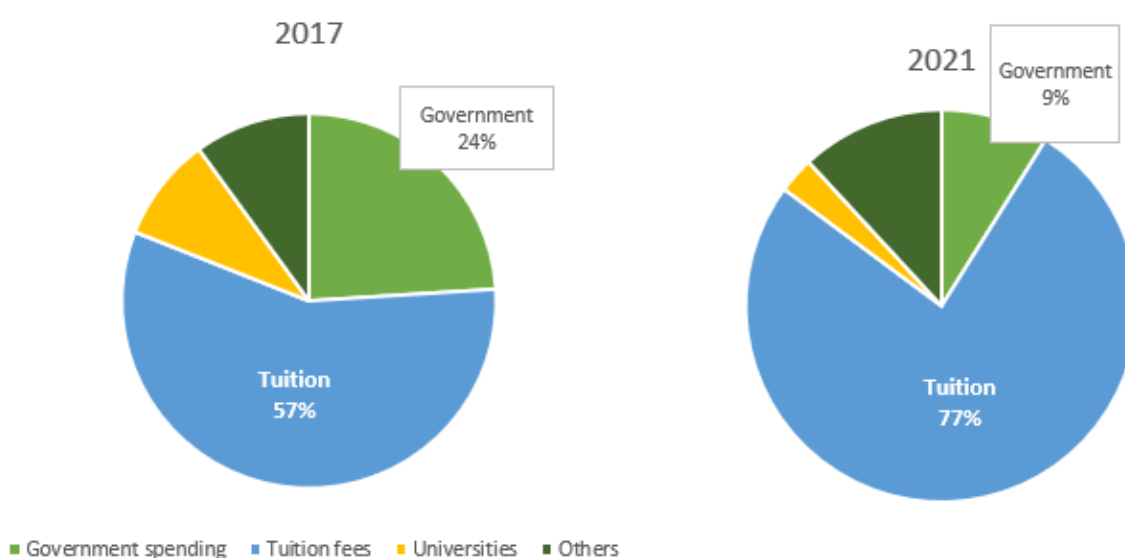


Figure 5: Sources of university income in selected public universities in 2017 and 2021

Data source: MOET’s survey of universities in 2018 and the World Bank’s rapid assessment survey in 2022

3.3. Inadequate allocation and inefficient use of state budget for university R&D

Vietnam’s highly qualified R&D personnel mostly work in universities but universities receive the lowest share of R&D funding from the state budget. Traditionally, universities must participate in specific research programs or nationally significant tasks to be eligible to submit research proposals, and before the approval of a new national STI strategy in 2022, universities were not considered a key player in the national R&D system with priority focusing more on training students. In 2019, 50 percent of Vietnam’s R&D staff with doctoral or master degrees worked at universities, however, they had access to approximately 16% of the state

budget for R&D at central and local levels and less than 7% of total R&D spending.⁵ The respective figures for their peers at research institutes or national research labs were 44% of the state budget and 17% of total R&D spending (Figure 6 and Figure 7).

Moreover, the limited resources for research in universities are currently used inefficiently as investments are scattered and poorly targeted, failing to boost productivity and not always being consistent with national and local strategic priorities. Public spending on research is managed by many agencies, including the Ministry of Science and Technology (MOST), line ministries of universities, and/or provincial authorities. This fragmentation hinders collaboration between different universities and research organizations, especially those under the management of different ministries/local authorities. It also creates barriers to interdisciplinary research since many universities/research institutes in Vietnam are still mono-disciplinary.

Other challenges to effectively and efficiently leverage R&D funding include (a) short-term, project-based research funding, which does not foster capacity building in a sustainable manner; (b) heavy reliance on input-based and process-oriented funding mechanisms, which creates cumbersome administrative procedures and non-transparency. Moreover, the funding terms are often unattractive and not incentivizing for university researchers, including low funding norms/standards and complicated and time-consuming funding application procedures. In particular, for young researchers having less than 5 years of experience and aged under 36, complicated and time-consuming procedures present the biggest barrier.

3.4. Limited participation of the private sector and public-private partnership

The Law on Public-Private Partnership (PPP), adopted in 2020, officially provide the legal framework for PPP investments in the education and training sector, including higher education.^{6,7,8,9} Previously, the Prime Minister's Resolution No. 35/NQ-CP dated June 4, 2019, on enhancing the mobilization of social resources for education and training during 2019-2025 also aims at gradually increasing public-private partnership (PPP) in education with a priority on infrastructure and civil work projects. Some possible activities include a) construction, operation of, and provision of services using structural works and infrastructure; b) renovation, upgrading, expansion, and operation of existing infrastructure and systems; c) operation of and provision of services using existing infrastructure.

Although the legal framework has gradually improved, the number of PPP projects in higher education remains very limited due to four main barriers both at policy and delivery levels. These are (i) limited understanding of PPP in education, which largely follows the traditional approach of education “socialization” with heavy reliance on tuition fees and household (social) contributions in promoting PPP in higher education; (ii) limited experience,

⁵Estimates based on the R&D report 2019 by the Ministry of Science and Technology. R&D personnel of HEIs accounted for about 53% of those having doctoral degrees (5,211 persons) and 50% of those holding master's degrees (14,269 persons). Similar estimates are made for the proportion of R&D spending in the state budget and the total spending on R&D as allocated to and disbursed by HEIs.

⁶ Decree 35/2021/ND-CP guiding the implementation of the PPP Law

⁷ Decree 28/2021/ND-CP on the financial management mechanism of PPP projects

⁸ Circular 50/2022/TT-BGTVT guiding the delivery of functions and tasks of competent agencies and agencies that sign and perform PPP contracts managed by the Ministry of Transport (MOT)

⁹ Decision 1191/QĐ-BXD issued by the Ministry of Construction (MOC) in 2017 on operational cost norms applicable to project management units under state agencies tasked to implement PPP projects

mostly from PPP infrastructure projects, especially in the transport sector; (iii) institutional and policy barriers to public universities, especially related to ownership and use of assets (including land); (iv) absence of guidance and technical support to deliver PPP projects in higher education.

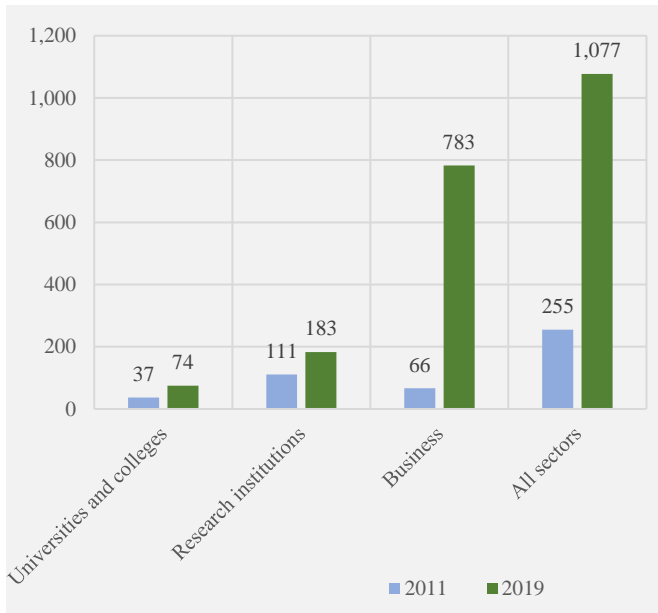


Figure 6: R&D funding by types of recipients (million USD, 2011 real price)

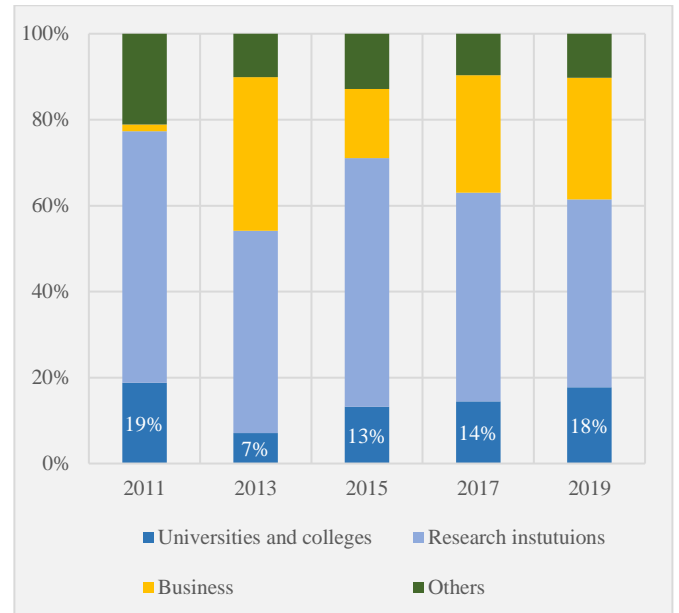


Figure 7: Shares of state budget funding for R&D by types of recipients (percent)

Data source: VISTA

4. Policy recommendations on higher education financing

The following policy recommendations are based on a view that higher education is a dynamic social contract between the government, universities, the household sector (students), and third-party patrons, where considerations of tuition fees and household contributions are social choices.

Recommendation #1. Avoid equating university financial autonomy with financial self-reliance

Vietnam should update its laws, regulations, and policies on financial autonomy and accountability and avoid equating financial autonomy with financial self-reliance or interpreting it as a gradual reduction of state budget support for universities and students.

Financial autonomy is meant to encourage institutional agility, flexibility in the utilization of funds, diversification of income sources, ability to make partnerships with the private sector, and risk sharing shifted from the state to institutions. Regular financial support from the state budget for improving access, quality, and relevance of university training should go hand in hand with stronger institutional autonomy and accountability, which allows universities to control their spending, industry partnerships, use of assets, and formation/operation of donations, not the reversal.

With the existing regulations on university autonomy and accountability (or, in general, for public service delivery units (PSDUs)), Vietnam's public universities are in a unique situation where they face a tradeoff between the institution's financial self-reliance/independence and the extent of its institutional autonomy and accountability. Globally, no country with an advanced, well-functioning higher education system would drastically or gradually drop state budget support for universities to a significantly low level and shift the financial burden to households/students as in Vietnam. **Continuing this practice will exacerbate inequities in access to quality education for students from disadvantaged backgrounds, expand the intergenerational gaps when they go to the labor market, and weaken the middle class and socio-economic mobility.**

Box 1. Malaysia's commitment to higher education for a knowledge-based economy

From the mid 2000s, the Government expanded access for and capacity to deliver higher education. Through the National Higher Education Strategic Plan 2007-2020, the MoHE sought to transform Malaysia's higher education into a system that would produce innovative, entrepreneurial life-long learners with the skills required for Malaysia's increasingly knowledge-based economy. Throughout that period, Malaysia's development strategy focused on human resource development, including university governance reform, research and development (R&D) orientation, improvement to the TVET system, and a life-long learning system. This was to meet the ambitious target of 50 percent of the Malaysian workforce being employed in high-skilled occupations by 2020. In 2006, Malaysia had about 649,000 students and rose to 1,3 million in 2019. The share of workers with higher education in the labour force was 19 percent in 2006 and rose to 41 percent in 2019.

The expansion of higher education was achieved through sustained public spending combined with rapid growth of the private sector. Malaysia's development expenditure for higher education has been around 34 percent of the total education budget in the 1980s to 1990s, falling to 27,5 percent in the early 2000s, signalling continued substantive public investment. In terms of recurrent budgets, the government has continued allocating public universities between 85 and 90 percent of their annual total operating budgets.

From 2015 onwards, the government sought to internationalize and commercialize higher education, and establish it as an export product, while reducing public expenditure on higher education. Similarly to Singapore, Malaysia's government saw the biggest cost-saving opportunities in a transition to an "entrepreneurial universities" which would be closer to the private sector communities, take in private funding and donations, conduct and commercialize research, and attract international students. By 2019 in Malaysia the number of students enrolled in higher education had risen to about 1.3 million with 46 percent of students enrolled in private HEIs.

Throughout this period, higher education reform remained a development priority for the Government of Malaysia. The most recent 10th (2011-2015), 11th (2016-2020) and 12th Malaysia Plans (2021-2025) each devote sections to, respectively, "raising the skills of Malaysians to increase employability", "human capital development", and "future talent development." The 10th Malaysia Plan aimed at mainstreaming and broadening access to quality TVET and enhancing the competencies of tertiary education graduates to prepare them for entering the labour market.

Source: World Bank staff consolidated from various sources.

Recommendation #2. Increase the state budget spending on higher education to at least 0.8%-1% of GDP by 2030

Vietnam should increase the state budget spending on higher education from 0.27% to at least 0.8% - 1% of GDP by 2030 in order to support universities to improve access, quality, and relevance, and to meet the increasing demand of the labor market for a university-educated workforce. On one hand, it is unrealistic to expect a substantial increase in public financing for higher education when the government faces budgetary constraints. On the other hand, if the country does not progressively raise its share of public funding for higher education, it will not be able to achieve its economic aspirations with the existing workforce and completely left behind other countries in the technology, innovation, and knowledge races.

The government budget can be used for two main purposes:

- a. Providing regular and stable state budget support to universities, including financially independent universities. The allocation mechanisms should consider the following principles: (i) alignment with national socio-economic development priorities, (ii) explicit link to performance, (iii) diversification of compatible financing instruments instead of only budgetary subsidies, (iv) stability and multiannual budget support without tradeoffs with institutional autonomy and accountability, (v) and allocation as a block grant based on sound formulas instead of historical norms (World Bank, 2020; more details in Recommendation#4).
- b. Providing financial incentives to students, including targeted tuition waivers, scholarships for disadvantaged students, and, in the medium and long term, reforms of the student loan system towards more sustainability to allow for income-contingent loans (ICLs).

Specifically, the state budget spending for higher education should increase by at least USD 100-340 million more (0.02%-0.08% of 2022 GDP) every year during 2024-2027 and by about 420-650 million (0.10%-0.16% of 2022 GDP) during 2028-2030.^{10,11} This additional spending, if realized, will bring Vietnam to be on par with the current levels of government spending on higher education in comparators and aspirators, for example, South Korea, Malaysia, Singapore, Israel, and Australia.

While the proposed budget increase appears large, by our estimation, the economic and financial benefits of higher education investment can completely outweigh the investment. With an internal rate of return of approximately 40%-65% and net benefit per dollar invested of USD 1.97 ~ 3.01 after deducting all real costs as well as opportunity costs, the government can fully offset the costs related to the state budget spending on higher education through additional tax benefits and social contributions from those receiving supports for their university study.

In the medium and long term, a sustainable approach for student loans would be to design and implement an income-contingent student loan scheme that offers students sufficient

¹⁰Vietnam's 2022 GDP of approximately USD 406.45 billion.

¹¹ This proposed budget increase is calculated based on the average unit cost per student in Vietnam's leading public, research-oriented universities, which is approximately USD 1,283/year in Vietnam National Universities, Hanoi and Hochiminh City, Hanoi University of Science and Technology, and University of Danang, and maintains the existing share of government contribution to the unit costs of public universities.

funds to cover both tuition fees and living costs. The traditional mortgage-type student loan system, with fixed repayment schedules, such as the one currently administered by the Vietnam Bank for Social Policies, will create a high repayment burden on low-income borrowers (Chapman and Liu 2013). International good practice shows that ICLs provide a more sustainable source of revenue (not a one-way subsidy) as the loans can be recovered more efficiently (with taxpayers tracked using the tax management system) and equitably (low repayment burden and related to future income streams).

Recommendation #3. Increase state budget allocation to research and development in universities to 30% of government spending on R&D

Increase state budget spending on research and development by universities – from the current 13%-18% to at least 30% of government spending on R&D, proportionally to its R&D potential and contribution to one-half of the national R&D workforce. This investment can be used for two main purposes (i) to support the development of a high-quality R&D workforce and (ii) to strengthen the R&D capacity of universities.

Box 2: China’s state budget spending for research and integrated research - training in universities

China provides a close example in this regard. First, the vast majority of China’s central government funding for basic research has been directed to national research institutes and universities. Consider China’s major basic research funding agency, the National Natural Science Foundation of China (NSFC), in its 2019 funding allocation, research institutes received 33.47% of the total fund, universities received 66.36%, and the rest 0.17% went to other sectors.

China has sustained a high level of government spending on higher education to strengthen both university training and R&D capacity through a series of investment initiatives and programs for more than 20 years, including the “Double First Class” (DFC) university system (See also Annex 2). The DFC University Plan focuses on building world-class universities and participating universities receive substantial and sustaining financial and political support from the central government to achieve its objectives. As of 2020, 36 of 42 DFC universities were in the top 500, and 21 were in the top 200 globally. Universities are required to submit project proposals and budget plans to the Ministry of Education (MOE) and the Ministry of Finance (MOF) for review before actually receiving funding, yet they are highly independent in determining how finances should be used, for example, setting up training programs or enrollment, etc.

For postgraduate training and research, since 2006, a mental shift to focusing more on improving quality instead of quantity growth has prevailed in China. The pressure for Ph.D. candidates to publish has diverted the focus from pushing the knowledge boundary to publishing more but weaker and less innovative research, sometimes at the cost of research integrity. Against this backdrop, the Chinese government has implemented policy reforms for quality enhancement, including, stricter quality control measures and quality-oriented criteria for monitoring and evaluation of research outcomes. In 2019, Tsinghua University, one of the leading DFC universities, also joined the shift by eliminating the requirement that Ph.D. candidates must publish to graduate to give them the freedom to pursue academic exploration rather than to meet rigid and short-term publication requirements.

Source: World Bank staff consolidated from various sources.

Vietnam has not yet made a commitment to invest substantially in building the R&D workforce and capacity of universities as a central player in the national R&D ecosystem. The Government of Vietnam's Strategy for Science, Technology, and Innovation for the period 2021–2030 include two critical tasks for universities – one, to substantially boost their R&D and innovation capacity to become strong R&D entities in the national system, and two, to develop a high-quality workforce for science, technological development, and innovation. The extent to which these missions can be successfully achieved depends greatly on the Government's ability and commitment to mobilize resources to support universities and ensure that such funding is used effectively.

Recommendation #4. Revise budget allocation mechanisms, simplify and harmonize regulations and rules

Vietnam needs to improve the efficiency of state budget investment in higher education through reforms of budget allocation mechanisms, improved accountability, and simplification of procedures, in parallel with increasing financial support levels. Key considerations include:

- a) For government financing for university R&D, Vietnam can consider combining the following two (i) integration of graduate research and training as currently implemented in some existing priority R&D programs, (ii) competitive financing (See also Annex 3);
- b) Design and implement a comprehensive funding allocation mechanism for universities, including performance-based financing, formula-based allocation of recurrent budget, and performance contracts to provide funding for qualified universities and competitive funding to support transformational investment;
- c) For students, lecturers, and researchers who benefit from or need access to grants/financial supports, there needs to simplify procedures and bureaucracy, improve information and communication as well as reduce is necessary to reduce review and approval time.

Viet Nam could consider piloting and/or enhancing the use of three funding models, including (i) funding formula, (ii) performance contracts, and (iii) competitive financing. The country could work towards a combination of formula financing and performance contracts for recurrent budget allocation, and pilot competitive financing as a channel for allocating public investment to support quality improvement.

Funding Formula. One of the most transparent and objective options in financing recurrent expenditure is to use a mathematical formula that links the allocated resources to institutional performance metrics such as the number of graduates, graduate employment rates and/or research results.

Performance Contracts. Performance contracts are non-binding legal agreements, negotiated between the government (represented by the budget management authority) and the universities, defining a set of common obligations. The government will provide financing based on *the university's commitment* to meeting the performance targets established in the agreement. These contractual arrangements may be made with some or all institutions in a given higher education system or with a single institution. All or part of funding may be disbursed based on actual results when participating institutions meet contractual requirements. This funding model encourages institutions interested in improving their results on a voluntary basis instead of top-down directives. From the government's point of view, this mechanism helps align the activities and objectives of universities with national policy objectives.

Competitive funding. Under this approach, HEIs will submit project/program proposals in competitive calls for proposals. These proposals will be reviewed and selected by a review committee based on transparent procedures and criteria. Positive experience in countries such as Chile, China, Egypt, Indonesia, and Tunisia has shown that competitive financing helps improve training quality and relevance while the quality of university governance and difficult-to-achieve targets can be delivered through formula funding. One of competitive funds' principal benefits is the practice of transparency and equity through the establishment of clear criteria and procedures and the creation of an independent monitoring committee. In addition, this mechanism encourages universities to undertake strategic planning activities, enabling them to formulate proposals based on solid identification of their needs and a coherent action plan.

Recommendation #5. Enable universities to pursue public-private partnerships (PPPs) and access to off-budget financing resources

Three key solutions to consider include:

- a) Update policies to enable public universities to pursue PPP for capital/infrastructure projects or other educational or ancillary services, including waiving the current investment amount for education PPP projects and simplification of procedures;
- b) Build institutional capacity to improve the university's capacity in income diversification and resource mobilization through donations, continuing education, PPPs, fundraising, and removal of penalties on enterprising universities.
- c) Given limited support from the state budget to public universities, it is necessary to remove policy barriers that are narrowing and hindering access to government and off-budget financing sources, especially regulations on on-lending, including on-lending rates, and collaterals by public universities.

Box 1 provides an example of a public-private partnership in higher education between Pham Ngoc Thach University of Medicine, the International Finance Corporation (IFC, World Bank Group) and a private sector partner. In addition, resource mobilization through cost sharing and socialization in education will hardly be able to achieve further progress when a comprehensive financial support system in higher education is not in place to ensure qualified students can access higher education programs regardless of economic background. As discussed in section 4.1, Vietnam can consider improving its student loan program by developing an income-contingent loan program, which is now being successfully deployed in many countries around the world.

Box 2: International Finance Corporation supported Ho Chi Minh City building health care facilities under a public-private partnership

In 2019, IFC and Pham Ngoc Thach University of Medicine (PNTU) signed a Financial Consulting Agreement to prepare bidding documents in seeking investors that can mobilize private investment in construction of a health care and HR training facility for HCMC in particular and the country in general.

According to the agreement between the two parties, PNTU appointed IFC as the main consultant in preparing bidding documents to seek investors for the project “Construction of the Day Care hospital and Human Resource Training Center” on its campus in the form of public-private partnership (PPP). The project includes a human resource training center, a department for general medical services and a day care hospital that is expected to serve 300,000 patients a year. The private sector partner involved in the project will be responsible for the infrastructure investment while PNTU is in charge of professional and training activities, with both tasked to operate this facility.

“Currently, medical needs in Ho Chi Minh City are huge due to rapid urbanization and population growth. However, local health care infrastructure and health care system cannot meet this demand effectively and promptly if it only relies on investment from the state budget,” said Associate Professor Dr. Ngo Minh Xuan, PNTU Rector. For the delivery of the project "Construction of the Day Care hospital and Human Resource Training Center", we believe that IFC support will help attract private investors that can provide solutions in an efficient and transparent manner.

Source: Ho Chi Minh City Government’s website

(https://hochiminhcity.gov.vn/tin-tuc-su-kien/-/asset_publisher/pcoYAr5aCkog/content/ifc-ho-tro-tphcm-xay-dung-co-so-y-te-thong-qua-hop-tac-cong-tu)

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Annex 1: An analysis of the supply of workers with higher education in Vietnam - results from a simulation exercise

A1.1 Summary of results

This note describes results from a simulation exercise to forecast the supply and demand of workers with higher education during 2023-2030 with a vision to 2045.

The higher education gross enrolment ratio (GER) is projected to be around 30.92% during 2030-2035 with 300,000 – 450,000 university graduates per year in a highly optimistic scenario where Vietnam’s higher education continues growing in the next seven years in terms of access, equity, and quality – through higher graduation rates and lower attrition. It is projected that in 2035-2036, Vietnam’s enrolment rate will catch up with China’s GER and the average GER of upper-middle-income countries in 2021.

On the supply gaps of workers with higher education, the baseline scenario shows that Vietnam’s universities will need to produce around 200,000 – 450,000 more graduates annually from now until 2030, in addition to its projected graduates during the same period. In this simulation of the demand-supply gaps, the demand is projected using Vietnam’s own policy targets related to the qualification of the labor force and the average share of workers with higher education in upper-middle-income countries in 2022 as benchmarks due to the uncertainties, volatility, and risks in projecting future demand of Vietnam’s labor market.

We conducted a sensitivity analysis with two additional scenarios - one makes different assumptions about university dropout rates, and one changes the transition rates from secondary schools and colleges to higher education. Forecasting results presented in the main scenario are corroborated by sensitivity analyses and none of the main conclusions change. Key outputs from these exercises are summarized in Table A1.1.

Key output indicators	Projected figures in 2030-2035			Vietnam’s average during 2017-2021	Vietnam’s policy targets in 2030	Average of upper-middle-income countries in 2020	Average of high-income-country in 2020
	Baseline scenario: progressive expansion	Sensitivity 1: Baseline & reduced university dropout	Sensitivity 2: Baseline & improved transition from secondary schools, colleges				
HE access rates for youth 18-24	23%	24%	25%	18%	35%	-	-
HE gross enrolment ratio	31%	34%	34%	25%		34%	47%
Share of workers with higher education for the 25-64 population	15%	16%	15%	9.8%		15%	27.8%

Table A1.1: Summary of projection results in 2030 three scenarios
Source: World Bank projection and International Labor Organization.

The projection exercise uses Vietnam’s historical education data from primary to tertiary education levels, collected from UIS, MOET education dashboard, MOLISA TVET dashboard, and population-level statistics from the GSO. Detailed data sources, calculations, and explanations of all assumptions are in Section A1.4.

A1.2. Baseline scenario

This scenario assumed that the trends in key performance indicators of the higher education system would slightly improve compared with what they were during 2017-2021, including dropouts in universities, the transition from upper secondary schools and colleges to universities, and access to universities for youth aged 18-24. We also assume better performance at the general education level as the result of the comprehensive reforms during 2015-2021. Key assumptions for the baseline scenario and sensitivity analyses are summarized in Section A1.4.

Projection of access and enrolment in higher education institutions

Vietnam’s access and enrolment in higher education, 23 years from now, will not be able to catch up to the level of high-income countries and/or OECD countries in 2020 although, in 2035-2036, it will catch up with the level of China in 2021 and the average of upper-middle-income countries in 2020 (Figure A1.1). Gross enrolment in universities is projected to fluctuate and improve modestly by about five percentage points (p.p.) during 2023-2035 from 25.7 percent to 30.9 percent.

For the group of youth aged 18-24, the access rate is projected to reach 23 percent in 2030, that is 23 out of 100 people aged 18-24 will be attending universities (Figure A2.2). This figure is far below the current target of 30 percent in 2030 set by the Government of Vietnam. At this projected pace of improvement, that 2030 target is not achieved even 15 years later in 2045.

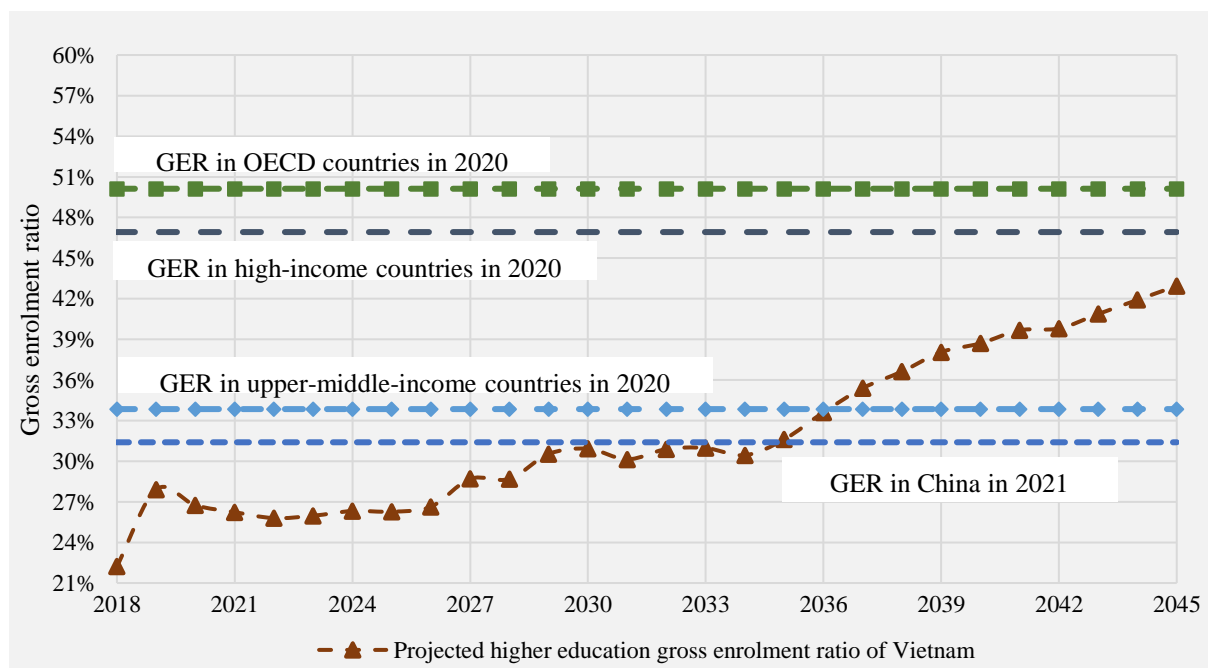


Figure A1.1: Baseline scenario - Vietnam's projected higher education gross enrolment ratio until 2045 versus benchmarking countries

Source: World Bank projection and UNESCO Institute for Statistics database.

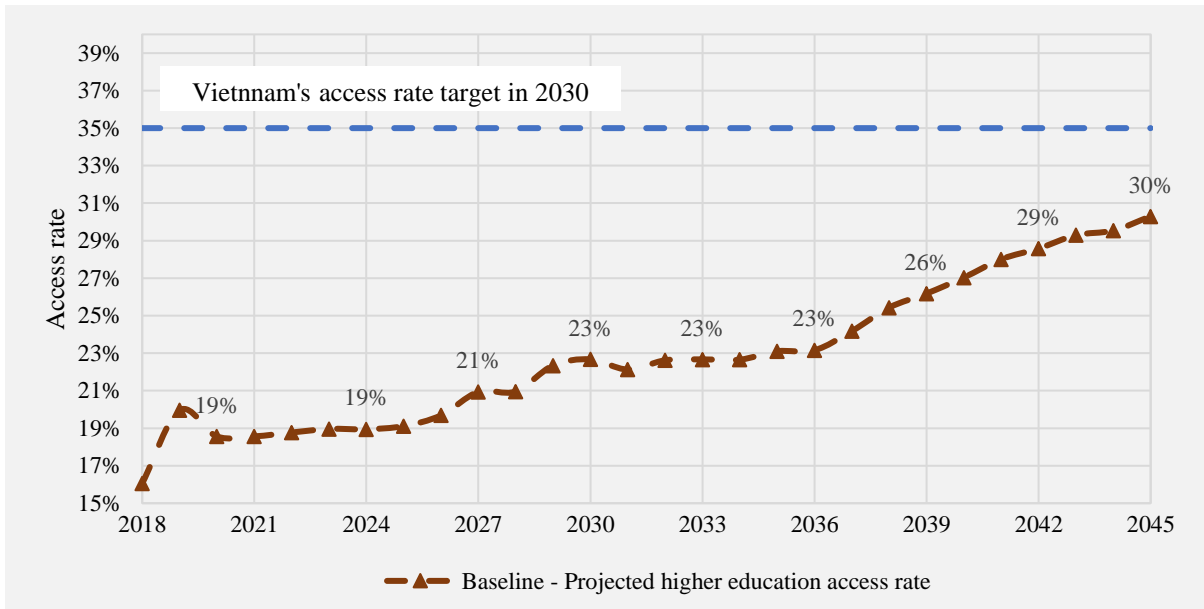


Figure A1.2: Baseline scenario – Vietnam’s projected higher education access rates versus policy targets
 Note: The higher education access rate is defined as the ratio of higher education enrolments to the population aged 18-24.
 Source: World Bank projection, Vietnam’s Education Strategic Plan 2023-2030.

Projection of the supply gaps of university graduates 2023-2030

If Vietnam aims at a labor force with 15.34 percent of workers having higher education, a share similar to the average of upper-middle-income countries in 2022, Vietnam’s universities will need to add around 200,000 – 430,000 new graduates every year from now until 2030, in addition to the projected supply of 300,000 – 450,000 (Figure A1.4). Specifically, the labor market will require around 800,000 to 900,000 new workers with university degrees every year, which might include graduates from Vietnam’s universities, online university-level programs, Vietnamese graduates from abroad, graduates from programs that provide credentials and ensure learners have university-level skills and knowledge, and foreign workers with university degrees working in Vietnam. With near full employment of workers with higher education in the past ten years, most of this demand will be met by new graduates from Vietnam’s higher education system or students returning from abroad. Assuming 75 percent of them come from Vietnam’s universities, Vietnam’s university system needs to almost double its projected capacity every year from 2023-2030.

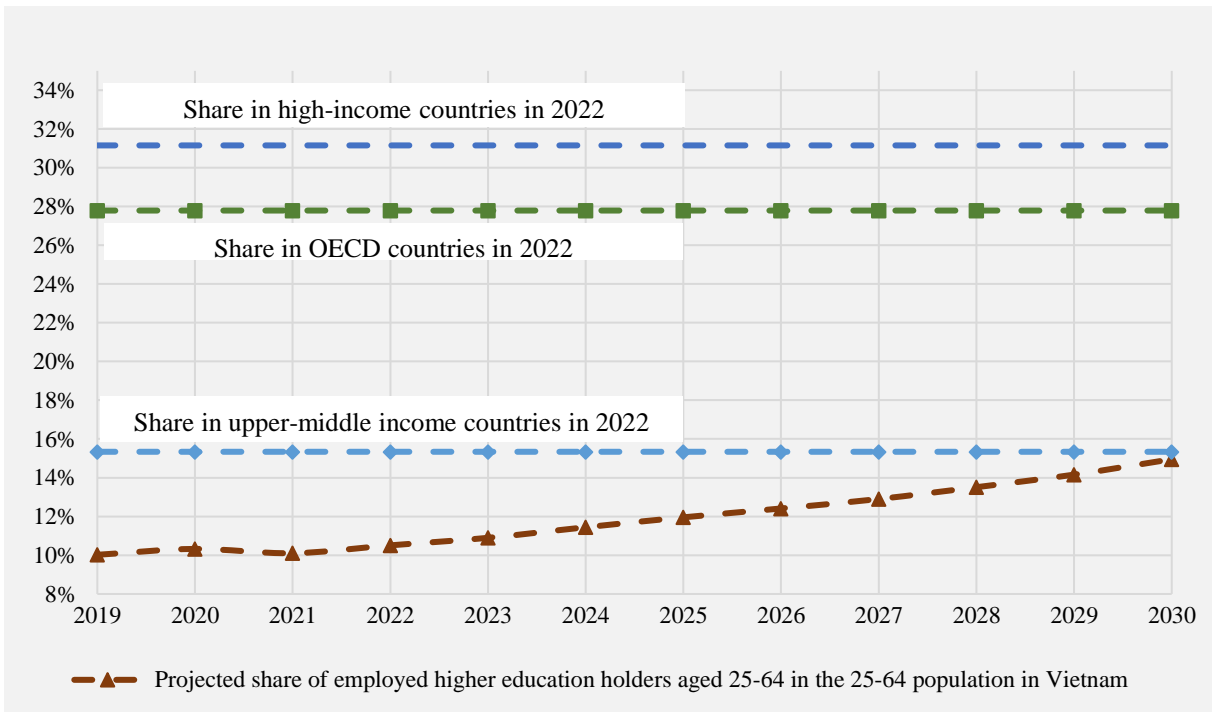


Figure A1.3: Baseline scenario - Projected share of employment aged 25-64 with a higher education degree in the population aged 25-64

Source: World Bank projection and International Labor Organization.

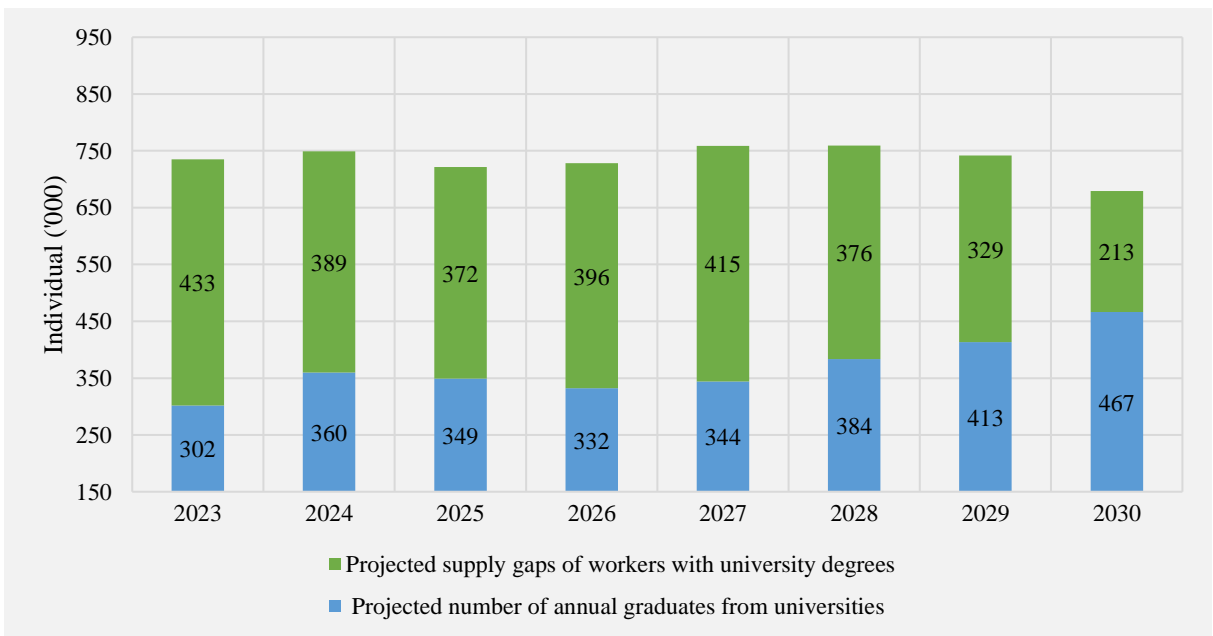


Figure A1.4: Baseline scenario - projected new higher education graduates & the supply gaps of workers with university degrees

Notes: The projected new higher education graduates from traditional higher education institutes (HEIs) are assumed to account for 75% of the total annual new supply of higher education holders. The projected annual demand for new workers with higher education holders aged 25-64 includes the demand for new occupations, the demand to fulfill the previous year's supply-demand gap, and the demand to fill the vacant positions resulting from individuals exiting the labor market.

Source: World Bank projection.

A1.3. Sensitivity analysis

The sensitivity analysis includes two case scenarios. Compared to the baseline scenario, the Case-2 scenario assumes a lower university dropout rate while the Case-3 scenario assumes a higher transition rate from upper secondary schools and colleges to universities. All other assumptions remain identical in the three scenarios.

In case-2 and case-3 scenarios, access, graduation, and employers with higher education are projected to be higher in the baseline figures (Table A1.1). The increase in higher education graduates resulting from decreasing dropout rates is projected to sufficiently close the supply gaps for workers with university degrees by 2029 (Figure A1.5 & Figure A1.6).

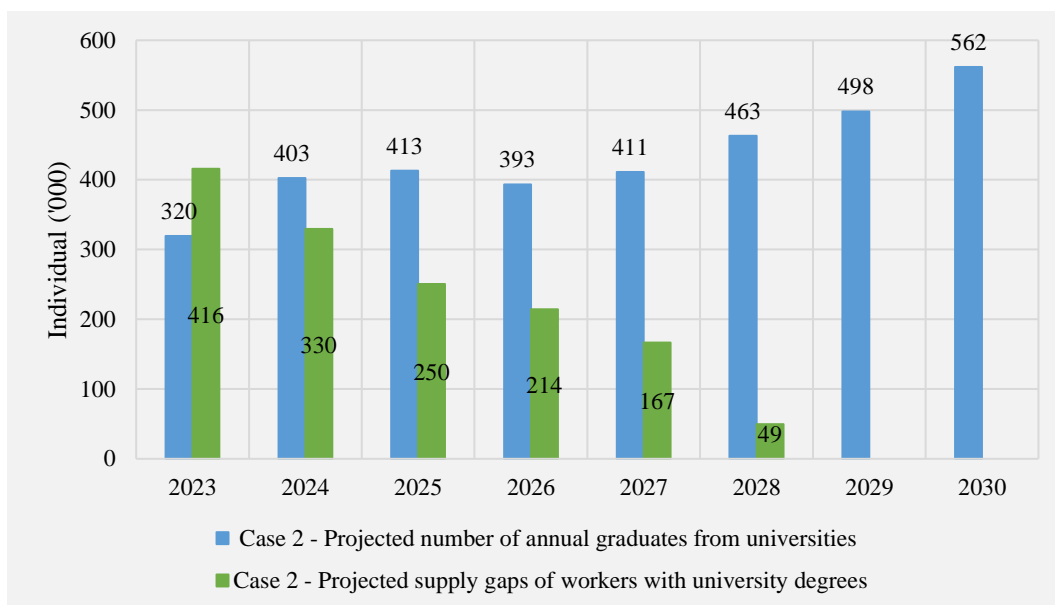


Figure A1.5: Sensitivity analysis: Case-2 Scenario with lower university dropout rates

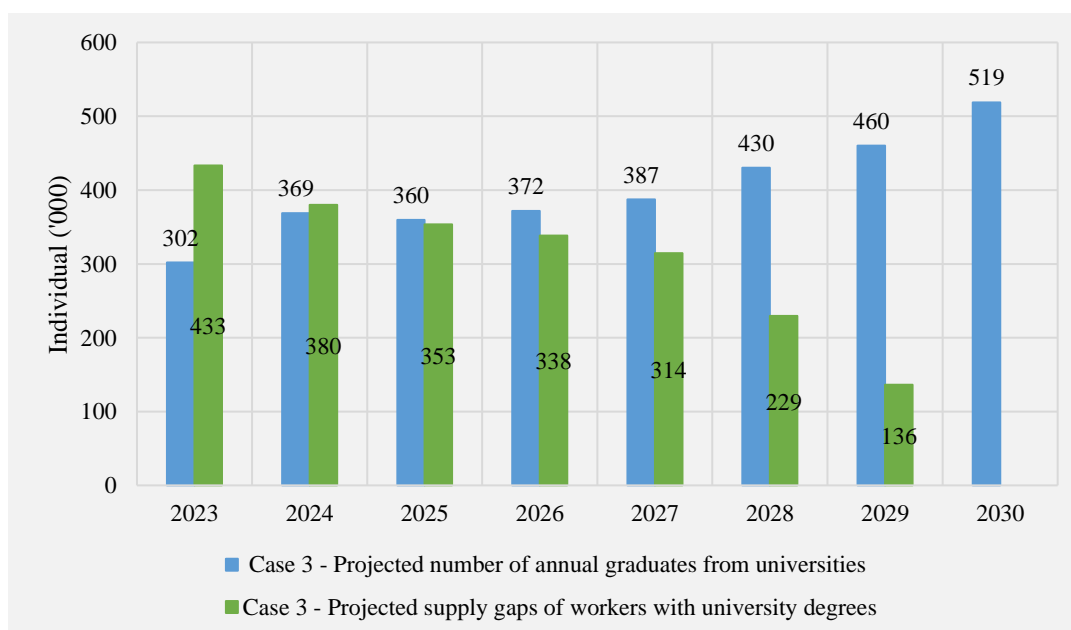


Figure A1.6: Case-3 Scenario with higher transition from upper-secondary schools and colleges to universities
Source: World Bank projection.

A1.4. Data source, assumptions, and detailed methodology

A1.4.1. Data sources

The table below summarizes key data used in the simulation exercises and their sources.

No.	Data	Sources
1	Vietnam's data on enrolment, attendance, and graduates from primary to colleges and universities 2014-2020	Ministry of Education and Training (MOET) and Ministry of Labor, Invalids and Social Affairs (MOLISA)
2	Vietnam's data on dropout rates, retention and transition rates across grades and levels of education	During 2016-2020: calculated backward using historical data on enrolments & graduates In 2021-2022: imputed using data from 2019 & 2020 Cross-validation with survival rates reported by MOET
3	Vietnam's higher education enrolments and graduates by fields of training and by types of institutions (public versus private)	UNESCO Institute for Statistics (UIS)
4	Vietnam's historical data and projection of population by age	Vietnam Population and Housing Census, General Statistics Office of Vietnam (GSO) "Vietnam population projection 2019-2069", GSO & United Nations Population Fund (UNFPA)
5	Vietnam's labor force composition, employment and non-participants by education level during 2016-2021	Estimated using the Labor Force Survey 2016-2021
6	Benchmarking data on education and labor indicators for China, OECD, high-income countries, and upper-middle-income countries	UNESCO UIS
7	Employment by education and population aged 25-64 in OECD, high-income countries, and upper-middle-income countries	International Labor Organization

A1.4.2. Key assumptions

Assumptions on the structure of Vietnam's education system

This exercise assumes that Vietnam's education system structure remains unchanged for the next 20 years. Specifically, the primary level comprises five grades (1 to 5), followed by the lower secondary level, which includes four grades (6 to 9). After completing the lower secondary level, students can pursue either the upper secondary stream under the MOET or the technical and vocational stream under the MOLISA (i.e., upper-secondary middle-level vocational training and upper-secondary professional schools, henceforth, TVET high school). Each of these streams comprises three grades (10 to 12). TVET high school and upper secondary graduates can enroll in 3-year colleges under the MOLISA (henceforth, TVET colleges) (grades 13 to 15) or a 4-year undergraduate program in universities (i.e., higher

education) (grades 13 to 16). TVET college graduates can continue their studies for additional two years to obtain an undergraduate degree (Figure 7).¹²

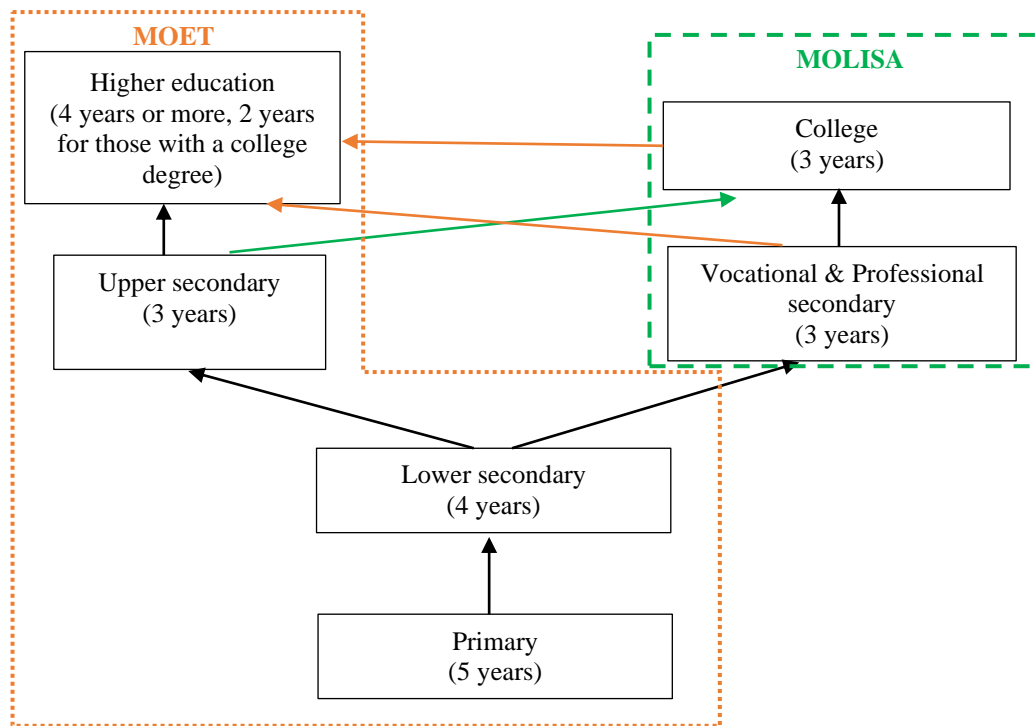


Figure A1.7: Vietnam’s education system during 2016-2023 and the assumed structure until 2045

¹² Article 3, Section 2 of Circular No. 04/2022/TT-BLDTBXH states that the duration of intermediate-level vocational training for those with an upper secondary diploma or higher varies from 1 to 2 academic years depending on the field of training. Meanwhile, the duration of college level varies from 2 to 3 academic years depending on the field of training for those who graduated upper secondary or graduated intermediate vocational training level with a certificate of completion of upper secondary education or a certificate of sufficient upper secondary knowledge or having studied and passed the required upper secondary exams. We assume that it takes another year for vocational and professional secondary students to accumulate upper secondary knowledge if they want to pursue a college or higher education degree; thus, the total time for vocational and professional secondary training is 3 years.

Assumptions on performance indicators are summarized in the table below. Whenever possible, we also include the historical data of the same indicators.

Indicators	Average 2017-2021	Average 2022-2023	Baseline scenario's assumptions during 2023-2045
Dropout rates by grade¹³			
- primary	3.08%	1%	The dropout rate in the year[y+1] is 1% lower than that of the previous year[y]'s level, starting from the 2022-2023 schooling year.
- lower secondary	5.06%	1.46%	
- upper secondary	10.20%	7.85%	
- TVET high schools	12.11%	12.63%	
- colleges	13.65%	14.58%	
- universities	14.38%	14.77%	
Transition rates between education levels			
Primary to lower secondary	99.2%	99.5%	2023-2026: transition rates increase by 0.1% per year and reach the maximum of 99.5% in the 2025-2026 schooling year (99.5% of primary students will go to lower secondary schools). 2026-2045: the rates of 99.5% in the 2025-2026 schooling year will remain unchanged until 2045.
Lower secondary to upper secondary	70.46%	72.93%	2023-2026: transition rates increase by 0.1% every year, on average, and reach the maximum of 73.04% in the 2025-2026 schooling year; due to major policy interventions (lower tuition fees, increase study stipend supports, build and renovate 5000+ high schools in ethnic minority and mountainous areas). 2026-2045: the transition rates of 73.04% in the 2025-2026 schooling year, increase by around 0.1% per year after that

¹³ The numbers are consistent with the survival rates (i.e., the proportion of students who remain enrolled in the highest grade of a particular education level without dropping out or repeating the grade) of primary, lower secondary, and upper secondary in 2019, which are 95%, 92%, and 94%, respectively (MOET, 2021, Education Sector Analysis Report).

Lower secondary to TVET high schools ¹⁴	16%	16.05%	2023-2035: transition rates are around 16.05% to 16.1%, and remain almost unchanged after that. During the whole period, the transition from lower secondary to TVET high schools in the year[y+1] is higher than that of the previous year[y] by less than 0.1%
Upper secondary & TVET high schools to TVET colleges ¹⁵	26.19%	28.9%	Transition in the year [y+1] improves slowly by around 1% from the previous level in the year[y]
Upper-secondary and TVET high schools to universities	44.8%	53.7%	The transition rate in the year[y+1] will increase at around 5% every year from the previous year[y]
TVET colleges to universities	4.75%	4.7%	Remain unchanged at 4.7%

¹⁴ Source: <https://baotintuc.vn/van-de-quan-tam/khoang-28-hoc-sinh-tot-nghiep-thpt-vao-hoc-nghe-20220301115603848.htm#:~:text=N%C4%83m%202020%2C%20s%E1%BB%91%20I%C6%B0%E1%BB%A3ng%20h%E1%BB%8Dc,t%E1%BB%91t%20ng%E1%BB%87p%20THCS%20m%E1%BB%97i%20n%C4%83m.>, accessed in April 2023.

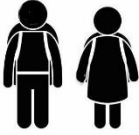

¹⁵ Source: <https://baotintuc.vn/van-de-quan-tam/khoang-28-hoc-sinh-tot-nghiep-thpt-vao-hoc-nghe-20220301115603848.htm#:~:text=N%C4%83m%202020%2C%20s%E1%BB%91%20I%C6%B0%E1%BB%A3ng%20h%E1%BB%8Dc,t%E1%BB%91t%20ng%E1%BB%87p%20THCS%20m%E1%BB%97i%20n%C4%83m.>, accessed in April 2023.


A1.4.3. Projection process

The projection employed the “**grade progression**” method, which traced each cohort through the twelfth year of schooling, accounting for those who may drop out along the way. For instance, the high school graduating class of 2022-2023 includes students enrolled in the first grade in 2011-2012. These same students are expected to enroll as university/college freshmen in 2023-2024 and graduate from university/college in 2026-2027.

First, we used historical data on enrolments and graduates, and projected population from the General Statistics Office of Vietnam (GSO) to forecast the enrolments and graduates. We then projected the gap between the supply and demand for higher education degree holders by using the information on higher education graduates in the labor population and the average share of individuals aged 25 or older with higher education who are employed in the population of the same age range in upper-middle-income countries between the 2015-2019 period.

The projection of enrolment/student flow for Vietnam’s tertiary education during 2023-2045 was conducted for three scenarios, (i) *Baseline scenario* – continue the current trajectory, (ii) *Case-2 scenario: reduced dropout rate* – a decrease in the tertiary dropout rates by 5% compared to the baseline, and (iii) *Case-3 scenario: increased transition rate* – an increase in the transition rates from upper secondary and vocational upper secondary to tertiary education by 5% compared to the baseline. The total number of enrolments and the number of graduates at each education level formed the basis for estimating future enrollments and graduates.

Projection process	
 <p>1. General education Enrolment at each grade, and graduate at each education level</p>	<p>Step 1) The number of enrolled students at each grade in 2016-2022 was calculated backward using the historical data on enrolments, new enrolments, and graduates at each education level from 2016-2020, and the imputed dropout rates and transition rates.</p> <p>Step 2) Grade 1 net enrolment from 2021 onwards was projected using forecast six-year-old population data from GSO. Out-of-school-age enrolments of these cohorts were projected using the computed out-of-school-age enrolments from 2018-2020. The gross enrolment of these grade 1 cohorts was then computed as the sum of grade 1 net enrolment and grade 1 out-of-school-age enrolment.</p> <p>Step 3) Enrolments at each grade and graduates at each education level from 2023 onwards were projected using the previous year's enrolment at the preceding grade, the assumed dropout rates, and the assumed transition rates.</p>
 <p>2. Tertiary education College and higher education enrolments at each grade and graduates</p>	<p>Step 4) College: The number of enrolled students at each college grade and the number of college graduates were projected using the information on enrolments in grade 12 upper secondary and TVET high school, the assumed transition rates, and assumed dropout rates.</p> <p>Step 5) Higher education: The number of enrolled students at each higher education grade and the number of higher education graduates were projected using the information on total enrolments in grade 12 upper secondary and TVET high school, college graduates, the assumed transition rates, and assumed dropout rates.</p> <p>Step 6) After 2030, due to the lack of historical data on out-of-school age enrolments and to account for the fact that people can enroll in higher education at any time in their life provided they have attained an upper secondary degree,</p>

	<p>the growth rate of the first-year higher education enrolment was used to forecast higher education enrolments. We assume that the annual growth rate of first-year higher education enrolments after 2030 equals the average growth rates of higher education access rates in the ten years from 2020-2030 (1.22% annually in the baseline) since the policy cycle in Vietnam lasts for a period of 10 years.</p> <p>Step 7) Higher education enrolments and graduates disaggregated by type of university were projected by assuming that the share of enrolments/graduates from private universities is constant over time and equals the share of enrolments in private universities in 2021 (23.01%). Higher education enrolments/graduates disaggregated by field of education were projected by keeping the shares of enrolments/graduates by field of education in 2016 constant over time, where enrolments/graduates from STEM majors accounted for 21.42%/22.68% of the total enrolments/graduates in 2016.</p>
 <p>3. Labor force Number of employed higher education graduates aged 25-64</p>	<p>Step 8) The population who exits the labor market by education level after 2021 was projected by taking the average of the previous five years' data on the inactive group between 60 and 64 years old by education level.¹⁶</p> <p>Step 9) The labor force and employment aged 25-64 years old by education level after 2022 were then projected using the assumed unemployment rates, the labor force in the previous year, new degree holders entering the labor market which includes new higher education graduates from Vietnam's traditional higher education institutes and new higher education holders from other sources such as foreign migrants and Vietnamese graduates returning from abroad, and the population who exited the labor market.</p>
<p>The gap between the supply and demand for higher education holders</p>	<p>Step 10) The annual total demand for higher education holders was estimated by first, setting the target share of employment with a higher education degree aged 25-64 in the same age group in 2030 to the average of the corresponding share in upper-middle-income countries in 2022. We then computed the annual gradual change in the target share from 2019 to 2030 using the target share in 2030 and the actual share in 2019. The annual target share was then computed using the actual share in 2019 and the gradual change. Subsequently, the annual total demand was computed using the annual target share and the projected population aged 25-64.</p> <p>Step 11) The annual total labor supply of higher education holders is the projected employment aged 25-64 years old with a higher education degree in Step 9.</p> <p>Step 12) The annual gap between the supply and demand for higher education holders is the difference between the annual total demand in Step 10 and the annual total supply in Step 11.</p>

A1.4.4. List of indicators

Indicator	Definition	Formula
Higher education access rate (AR)	AR: the ratio of total higher education enrolments to the population aged 18-24	$AR (\%) = \frac{\text{Total higher education enrolment}}{\text{Total population aged 18 to 24}} \times 100\%$
Higher education gross enrolment ratio (GER)	GER: the ratio of total higher education enrolments to the population aged 18-22	$GER (\%) = \frac{\text{Total higher education enrolment}}{\text{Total population aged 18 to 22}} \times 100\%$

¹⁶ We excluded the data for 2020 and 2021 when averaging due to the high number of people exiting the labor market in 2020 and 2021 as a consequence of the pandemic.

Share of the number of individuals aged 25-64 with a higher education degree who are working in the 25-64 population	The share of individuals aged 25-64 with a higher education degree who are working, in the total population aged 25-64	$Share = \frac{\textit{The number of individuals aged 25 to 64 with a higher education degree who are working}}{\textit{Total population aged 25 to 64}} \times 100\%$
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Annex 2. Financing Vietnam’s Higher Education – Results from a simulation exercise

A2.1. Summary of the results

This note presents the results of the higher education (HE) financing projection to the Vietnamese government and households from 2023 to 2030 in different scenarios. In the baseline scenario, it is projected that the government will need to spend USD 0.650–1.215 billion (in 2023 prices) per year to support 1,314–1,835 thousand students from 2023–2030 to ensure quality and access. It is equivalent to 0.16% – 0.31% of 2022 GDP^{17,18}, representing an average annual increase rate of 9.4%, but still much lower than the government expenditure on tertiary education (excluding R&D) of the OECD average or Korea (i.e., 0.84% and 0.38% of GDP in 2019, respectively). Relative to the average level during 2016–2022, the government needs to increase the annual spending by USD 100–340 million (0.02–0.08% of 2022 GDP) during 2024–2027 and by USD 420–650 million (0.10–0.16% of 2022 GDP) during 2028–2030.

Regarding the household spending, for each student per year, Vietnamese households would pay from USD 602 in 2023 to USD 831 in 2030. This estimation assumes that the household contribution to the unit cost per student Vietnam continues to be at 45%, which is higher than that of the OECD average, China, the US, Korea, and Thailand. During the next seven years, household contribution to each university student would equal to about 161% of the median household income for the poorest welfare quintile but only 2% for the richest quintile.

We also examine two other scenarios: (i) the unit cost would be equal to that of Hanoi University of Science and Technology (HUST), one of the highest-ranking universities in science and technology nationally and where the unit cost is lower than at national universities (Sensitivity 1); and (ii) the share of students enrolled in public universities scenario would decrease (Sensitivity 2). All other assumptions in the baseline scenario continue to hold. Estimating results in the sensitivity analysis show that government expenditure on HE is the lowest when the percentage of the projected students enrolled in private universities continuously increases (i.e., the annual rate of increase is 16.2%). For households, relative to the baseline, their financial contribution to the unit cost in public universities (in absolute terms) is lessened in either Sensitivity 1 or Sensitivity 2, with the government spending on HE remains their investment at the historical level. Key outputs from these exercises are summarized in Table A2.1.

¹⁷ Vietnam’s 2022 GDP in current prices (i.e., USD 406.45 billion) are used in all calculation.

¹⁸ The average imputed level during 2016–2022 is 0.17% of 2022 GDP.

Table A2.1: Summary of projection results in 2030 three scenarios

Output indicators	Projected figures in 2023-2030		
	Baseline scenario: unit costs equal average of leading research universities	Sensitivity 1: unit costs 20 percent lower than the baseline	Sensitivity 2: Baseline, increased share of enrolment in private universities, no government support for private universities
Government expenditure on HE (% GDP)	0.16% – 0.31%	0.13% – 0.25%	0.14%-0.09%
Household contribution to unit cost in public universities (USD, 2023 prices)	USD 602-USD831	USD 486- USD 671	USD 602- USD 831
Household contribution to unit cost in public universities (% of median household income of the poorest quintile in 2022)	137%-189%	110-154%	137%-189% ¹⁹

Source: World Bank projection

A2.2. Baseline results

The results in the baseline scenario are estimated under two sets of assumptions. The first set is those made for estimating the number of enrolled students and similar to key assumptions for the baseline scenario of the supply and demand of workers with HE analysis (i.e., Vietnam’s HE continues growing through 2030 in terms of access, equity, and quality). The second set of assumptions is those related to the unit cost and cost-sharing structure, including: (i) the unit cost, the cost per student per year, used in the estimation is the average unit cost of 04 public research-oriented umbrella universities²⁰ in Vietnam in 2020 adjusted to the 2023 price (i.e., the unit cost in 2022 is USD 1,283) which themselves consist of 31 member universities; (ii) the annual rate of increase of the unit cost is the mid-level of the average real growth rate of the **tuition ceilings for public higher education institutions** not self-financing their recurrent expenditure **set in Decree No. 81/2021/ND-CP (i.e., 4.7% per year) (details of the tuition ceilings can be found in Table A1)**; and (iii) the cost-sharing structure in public universities and the distribution of enrolled students in public-private universities remain at the current level (i.e., the average of 2013 and 2017 and the average of 2021 and 2022, respectively).

Projection of government spending on higher education enrolment

The total spending of all stakeholders (governments, households, private sectors, non-governmental organizations and funders) in Vietnam is estimated at USD 2.292 billion in 2023 to

¹⁹ It will be reduced to 116%-47% if the government remains its spending for enrolled students (i.e., 0.17% of 2022 GDP)

²⁰ including Vietnam National University-Hanoi (VNU-Hanoi), Vietnam National University-Ho Chi Minh City (VNU-HCMC), Hanoi University of Science and Technology (HUST), and University of Danang (UD)

USD 4.415 billion in 2030 (Figure 1) to support 1,707 – 2,384 thousand projected enrolled students that only meet up to half of the projected annual new demand for higher education holders.²¹ It translates to 0.56%-1.09% of 2022 GDP.

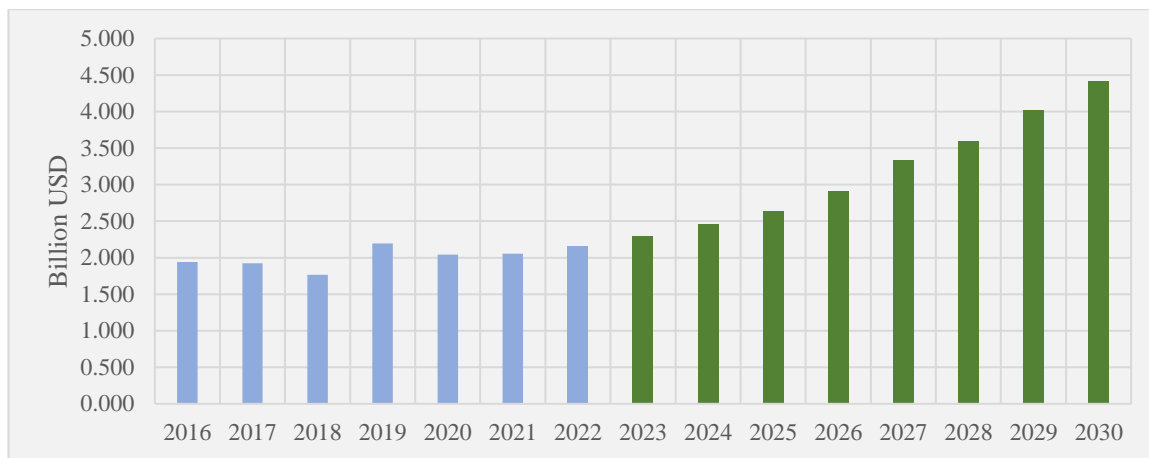


Figure A2.1: Projected spending for higher education all stakeholders in Vietnam until 2030 – Baseline scenario
Source: WB staff calculation

The Vietnamese government is estimated to spend 0.16%-0.31% of 2022 GDP annually during the period 2023-2030 (Figure A2.2) to support the projected number of students enrolled in public universities (i.e., 1,314-1,835 thousand) that only fulfill up to 50% of the new demand for HE holders every year. In absolute terms, it equals to USD 0.791–1.524 billion per year. The estimated government spending on HE in Vietnam is much lower than that of the OECD and Korea (0.84% and 0.38% in 2019, respectively) (Figure A2.2).

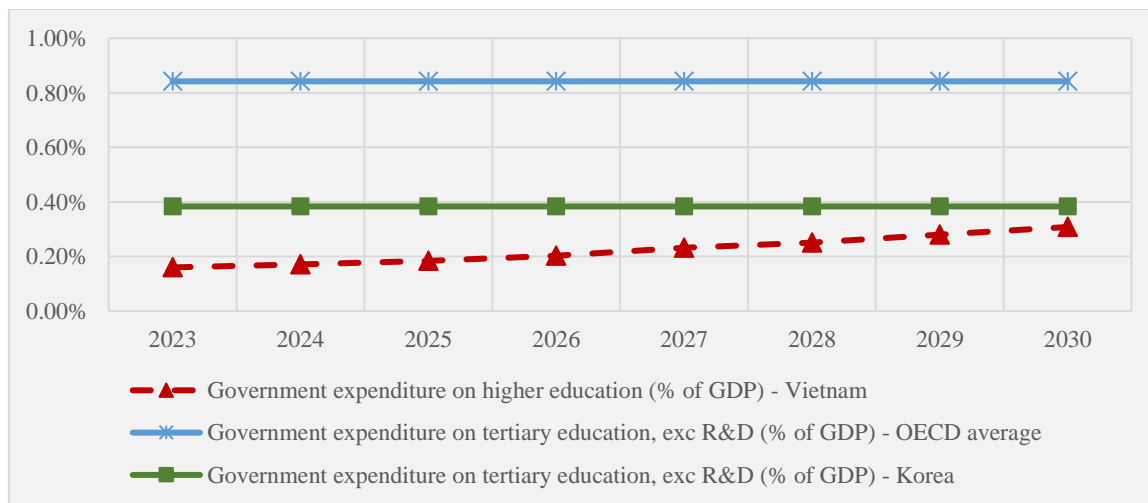


Figure A2.2. Projected government expenditure on higher education (% of GDP) in Vietnam and other countries²²
Source: WB staff calculation, OECD, IMF

²¹ Assuming 75% of the annual demand comes from new graduates in Vietnam’s universities. Details of this projection is in the supply and demand of workers with HE analysis.

²² Data of the OECD average and Korea are in 2019.

Projection of household spending on higher education enrolment

Continuing the current cost-sharing structure will leave Vietnamese households bearing an average of 45% of the unit cost of public universities, equivalent to USD 602 in 2023 and USD 831 in 2030 per student per year. This proportion of household contribution to unit cost is higher than that of the OECD average and China (Figure A2.3).²³ In relative terms, for each student, households are estimated to bear the annual cost equivalent to 11% of median household income in 2019 and 17% of average GDP per capita in 2022. Notably, the unit cost of public universities borne by households accounts for 137%-189% of the median household income for the poorest group from 2023 to 2030, but only 2%-3% for the wealthiest group.

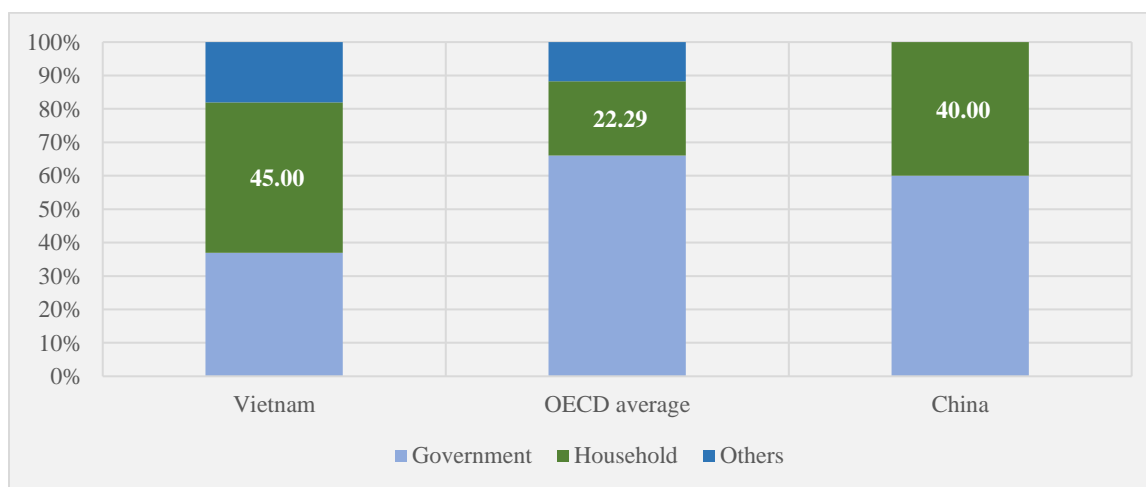


Figure A2.3. Cost-sharing structure in HE in Vietnam and other countries²⁴

Source: University survey 2018, OECD, UNESCO

A2.3. Sensitivity analysis

Two additional scenarios. Two additional scenarios are examined to assess the sensitivity of the results in the baseline scenario with changes in different assumptions. Relative to the baseline scenario, the unit cost is assumed to decrease to the average level of HUST during 2021-2022 in Sensitivity 1, while in Sensitivity 2, the proportion of students enrolled in private universities will increase to the Korean level. Overall, results in those scenarios corroborate with the baseline results.

Lower unit cost compared with the baseline. In this case, the average unit cost of HUST, the leading science and technology in Vietnam, during 2020-2021, adjusted to the 2023 prices (i.e., USD 1,036 per student per year) is used for calculation, which is 20 percent lower than the baseline scenario. The estimated unit cost ranges from USD 1,085 in 2023 to USD 1,496 in 2030. Accordingly, the government spending on HE to support the projected enrolled students is estimated to decrease to 0.13%-0.25% of GDP (Figure A2.4). In addition, households would need

²³ In a sample of public universities that we collected the 2022 data, household contribution to unit cost accounts for an average (between 2013 and 2021) of 68% (unweighted by the number of students) and 72% (weighted by the number of students).

²⁴ In other countries, data is in tertiary education in 2019.

to pay lower for each enrolled student in public universities relative to the baseline (i.e., on average, 9% of the median household annual income in 2019). The proportion of median household income contributing to the cost per student reduces from 161% in the baseline scenario to 130% in this scenario for the poorest group, whereas that remains at 2% for the wealthiest group.

Lower share of students enrolled in public universities. Under this scenario, we assume that the proportion of students enrolled in private universities will reach the average level in Korea during 2013-2020 (i.e., 76.5%). Its average annual increase rate is estimated at 16.2%. The number of projected students enrolled in public universities is approximately 1,250 thousand in 2023 and 560 thousand in 2030. The estimated government expenditure is USD 618–382 million (i.e., 0.14%-0.09% of 2022 GDP) (Figure A2.4), representing a decrease of about 32% relative to the baseline. The contribution of Vietnamese households to the cost per student of public universities remains the same as the baseline scenario; however, the decreased proportion of students enrolled in public universities will worsen the access to HE for the poorest group, partly due to the higher cost of private universities relative to public universities.

In this case, if the government continues its spending of 0.17% of 2022 GDP (i.e., the imputed average level during 2016-2022), the government funding would account for 43.5%-70.5% of the total expenditure for the projected enrolled students in public universities (i.e., 1,250-556 thousand students during the period 2023-2030).

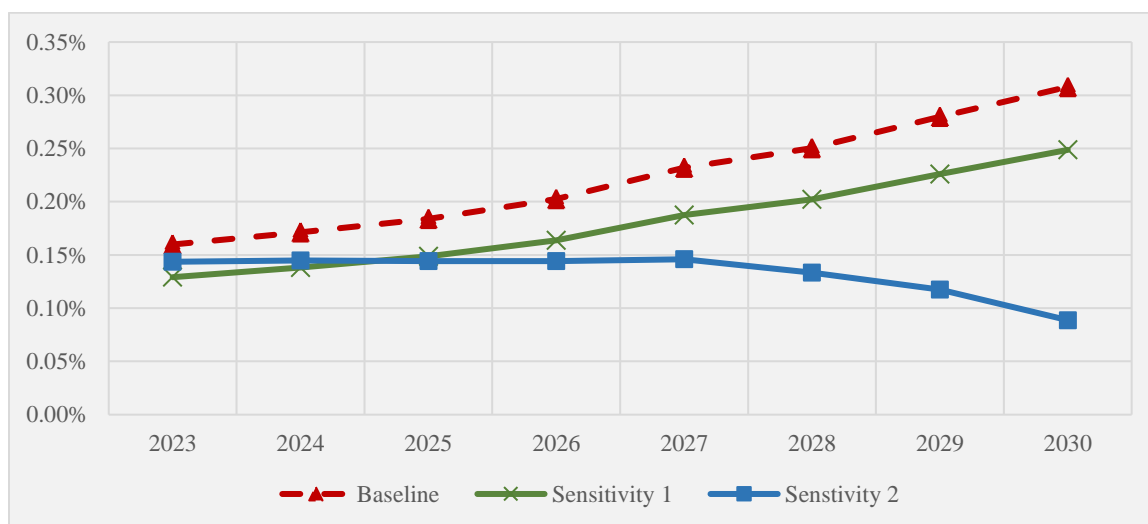


Figure A2.4. Projected government expenditure on higher education (as % of GDP) in different scenarios
Source: WB staff calculation

A2.4. Data source, assumptions, and detailed methodology

A2.4.1. Data source

- Data on universities' annual expenses are obtained for four public universities in Vietnam, including VNU-Hanoi, VNU-HCMC, HUST, and UD due to limited disclosure and access to information. Nevertheless, VNU-Hanoi, HUST, and VNU-HCM are leading research-oriented universities in northern and southern Vietnam, and UD is the top research institution in the central part of the country.

- Data on historical sources of revenue and the number of enrolled students are from the University Survey conducted by the Ministry of Education and Training (MOET) in 2018. This survey covers all public and private universities in Vietnam. We complement the data with that collected from the websites of a sample of universities. Vietnamese universities are required to publicly disclose information on (i) the commitment to quality education and actual quality of education, (ii) quality assurance conditions, and (iii) financial revenues and expenses under Circular 36/2017/TT-BGDDT in 2017. Nevertheless, not all universities disclose the information, and the disclosure period varies across universities.
- We collect the average annual increase rate of tuition ceilings for public higher education institutions from Decree No. 81/2021/ND-CP in 2021, which set the latest ceilings for tuition fees for public universities by group of disciplines for the academic years from 2015/16 to 2020/21.
- Data on the inflation rate, GDP, and GDP per capita are obtained from the IMF DataMapper. We also use data from the General Statistics Office of Vietnam (GSO) to double-check.
- Data on household income are from the Vietnam Household Living Standard Survey.
- The USD/VND exchange rate is the central exchange rate on December 31, 2022 issued by the State Bank of Vietnam.
- Data on total public expenditure on tertiary education (excluding R&D) and the number of students enrolled in different types of institutions in Korea are obtained from OECD.

A2.4.2. Assumptions

The main assumptions of the projection are summarized in Table A2.2.

Table A2.2: Summary of assumptions for the baseline scenario

Assumptions	Available data	Estimation	Values
Unit cost per student in 2022	<ul style="list-style-type: none"> ▪ Annual expenses and the total number of students of VNU-Hanoi, VNU-HCM, HUST and UD in 2020 ▪ Inflation rates in Vietnam from 2020-2023 from IMF Datamapper 	<ul style="list-style-type: none"> ▪ Average the unit cost of VNU-Hanoi, VNU HCM, HUST, VNU and UD in 2020 ▪ Adjust to the 2023 prices using the inflation rates ▪ The unit cost is also assumed to be equal for public and private universities 	USD 1,283
Annual increased rate of unit costs during 2016-2022	<ul style="list-style-type: none"> ▪ Public spending per student in 2016 from the World Bank's report "Improving the performance of higher education in Vietnam: 	<ul style="list-style-type: none"> ▪ Calculate the unit cost in 2016 by dividing the public spending per student by the average percentage of government funding of total universities' revenue in 2016 	2.63%

	<p>Strategic priorities and policy options”</p> <ul style="list-style-type: none"> Universities’ revenues from different sources in 2016 (all universities) 	<ul style="list-style-type: none"> Impute the annual rate of increase during 2016-2022 	
Annual increased rate of unit costs during 2023-2030	<ul style="list-style-type: none"> Tuition ceilings for public HE institutions not self-financing their recurrent expenditure (Table B1) from 2023 to 2026 stipulated in Decree No. 81/2021/ND-CP in 2021 Inflation rates in Vietnam from 2012 to 2021 	<ul style="list-style-type: none"> Calculate the average annual increase rate of tuition ceilings (i.e., 17%) Use the mid-level of the average of the annual increase rate (i.e., 8.5%) Adjusted for inflation using the 10-year average inflation rates (i.e., 3.8%) 	4.7%
Cost-sharing structure during 2023-2030	<ul style="list-style-type: none"> Universities’ revenues from different sources from 2013 to 2017 (all universities) Universities’ revenues from different sources from 2013 to 2017 and 2021 (sampled universities) 	<ul style="list-style-type: none"> Calculate the cost-sharing structure for each year and each sample, unweighted by the number of students Average the government and household proportions over 2013-2017 	<ul style="list-style-type: none"> Government: 37% Household: 45% Others: 18%
The number of enrolled students during 2023-2030		<ul style="list-style-type: none"> The assumptions of the <i>baseline scenario</i> of the Supply Projection. In general, the scenario assumes the current trends in tertiary education continue, including the trends in the dropout rates and transition rates. (Refer to the Section A2 in the Supply Projection) 	<ul style="list-style-type: none"> <u>Dropout rates</u> at each grade in 2023 are 1% for the primary level, 1.46% for the lower secondary level, 7.85% for the upper secondary level, 12.63% for TVET high school, 14.58% for college, and 14.77% for higher education. <u>Transition rates</u>: <ul style="list-style-type: none"> between primary and lower secondary: at the maximum in 2025 (at 99.5%) between lower and upper secondary schools would peak in 2026 (at 73.04%) between lower secondary and TVET high school: increase by less than 0.1% every year, starting from its value of 16% in 2019

			<ul style="list-style-type: none"> ▪ Between upper secondary and TVET high school to higher education transition rates are assumed to increase at a diminishing rate of less than 5% every year, with the transition rates in 2023 and 2026 being 53.7% and 58.9%
Percentage of students enrolled in public universities during 2023-2030	% HE enrolments from private universities in Vietnam (i.e., 23.01%) during 2021-2022		76.99%

A2.4.3. Calculation methods

The financing analysis is performed in **five steps**.

- Step 1 – unit cost: the historical unit cost is calculated by dividing the university’s total expenses by the total number of students, including both full-time and part-time students, in 2020. The cost is adjusted to the 2023 price using the inflation rates. It is estimated to increase over time using the inflation-adjusted annual growth rate of tuition fees.
- Step 2 – total expenditure on higher education to all stakeholders: the annual expenditure on HE is the product of the number of enrolled students per year and the estimated unit cost. This calculation is conservative because it assumes that the unit cost is similar between the public and private universities.
- Step 3 – total expenditure in public universities: to calculate the total expenditure in public universities, we multiply the total expenditure on HE to all stakeholders by the proportion of students enrolled in public universities.
- Step 4 – government and household expenditure in public universities: the proportion of costs borne by the government (households) is calculated by multiplying the total expenditure in public universities and the proportion of the public universities’ revenues from the government (households), respectively.
- Step 5 – government and household spending per student in public universities: it is the product of the estimated unit cost and the proportion of the public universities’ revenues from the government and household, respectively.

A4.4.4. The ceilings of tuition fees in public universities stipulated in Decree No. 81/2021/ND-CP dated August 27, 2021

Table A1. The ceilings of tuition fees for public higher education institutions not self-financing their recurrent expenditure by discipline

Unit: VND thousand/student/month

Groups of disciplines	School year 2021 – 2022	School year 2022-2023	School year 2023-2024	School year 2024-2025	School year 2025-2026
Teacher training and science education; Business and administration, law	980	1,250	1,410	1,590	1,790
Arts	1,170	1,200	1,350	1,520	1,710
Life sciences, natural sciences	1,170	1,350	1,520	1,710	1,930
Mathematics, computer statistics, information technology, technical technology, engineering, manufacturing and processing, architecture and construction, agriculture, forestry, aquaculture, and animal health	1,170	1,450	1,640	1,850	2,090
Other health disciplines	1,430	1,850	2,090	2,360	2,660
Pharmacy	1,430	2,450	2,760	3,110	3,500
Humanity, social sciences and behavior, journalism and communication, social services, tourism, hotels, sports, transport service, environment, and environmental protection	980	1,200	1,500	1,690	1,910

Annex 3 – China’s “Double First Class” Universities

China's leadership has embraced Science, Technology, Engineering, and Mathematics (STEM) graduates as a pivotal human resource in its strategy to develop an innovation- and science-and-technology-driven economy. Over the last two decades, Chinese authorities have mobilized an array of policies to implement this strategy, ranging from enrollment expansion to quality enhancement. Recently, at the 20th National Congress of the Communist Party of China in 2022, the President of China, Xi Jinping, reiterated this emphasis by stating that “science and technology as our primary productive force, talent as our primary resource, and innovation as our primary driver of growth.”²⁵

From 2000 to 2018, the number of STEM's PhD students in China has increased for more than 4 times (Figure in Annex 1). During this period, STEM consistently accounted for the majority of doctoral students graduated from Chinese universities.^{26,27,28} In 2000, the number of PhD student completed doctoral program in Chinese universities was less than a third of those in the US universities. However, they nearly caught up with their US counterparts in 2018. Following the same trend, China’s annual STEM PhD graduates are expected to almost double those in the United States by 2025.ⁱⁱ

Approximately 45% of Chinese Doctors graduates come from “Double First Class” (DFC) universities, which is the top-tier universities in China. DFC universities are those included in the Double First Class University Initiative, a continuation and adjustment of policies of the Government focusing on the construction of world-class universities in China. These universities have received considerable central government education and research resources to achieve this goal.ⁱⁱ In 2020, 36 of the 42 DFC universities were in the top 500 global universities, and 21 were in the top 200.

Substantial and long-term financial support to key universities under the DFC University Initiative and its preceding initiatives has contributed to the surge in postgraduate training. During the initial period, the investment focusing on upgrading teaching and research infrastructure enabled the universities to meet the radical increase in higher education students. In particular, DFC universities had their budget of financial allocation during the period of 2016 to 2020, accounting for 81 percent.²⁹ The research infrastructure development is especially essential for doctoral education & postdoctoral training. In addition, the increase in central government

²⁵The State Council of the People's Republic of China (2022). *Full text of the report to the 20th National Congress of the Communist Party of China*.

https://english.www.gov.cn/news/topnews/202210/25/content_WS6357df20c6d0a757729e1bfc.html. Retrieved 3/11/2023.

²⁶ Remco Zwetsloot, Jack Corrigan, Emily Weinstein, Dahlia Peterson, Diana Gehlhaus and Ryan Fedasiuk (2021). *China is quickly outpacing U.S. STEM PhD Growth* Center of Security and new Technology.

²⁷Ministry of Education, Department of Development Planning, data in various years.

²⁸ Denis Fred Simon, Cong Cao (2009). *China's Emerging Technological Edge: Assessing the Role of High-End Talent*. Cambridge University Press.

²⁹ Jian Li, Eryong Xue (2021). *Building World-Class Universities in China: Initiatives, policies and implementation efforts*. Springer Nature

funding allowed the DFC universities to attract, recruit, and retain highly qualified faculty members that effectively affected the universities' capacity to establish PhD programs.

Research-oriented universities with a strong foundation in science & engineering are in leadership positions in the Chinese government's determined efforts to develop world-class universities. In particular, the first nine selected universities are leading public research universities in China. 06 universities had S&E backgrounds (Harbin Institute of Technology, Shanghai Jiao Tong University, Tsinghua University, University of Science and Technology of China, Xian Jiao Tong University, and Zhejiang University), and the other 03 were traditional comprehensive universities (Fudan University, Nanjing University, and Peking University).

Training high-skilled students is a fundamental task of the DFC Initiative and one of the criteria for selecting universities and allocating annual fund.³⁰ While the universities had to submit their project proposals and budget plans for the Ministry of Education (MOE) and the Ministry of Finance (MOF)'s review to receive funding, they still had a high level of autonomy in determining how they spend it (e.g., establishing training programs, enrolling students, etc.).

Since 2006, a mental shift from increasing the size of PhD graduates to improving their quality in China has prevailed. The high pressure to publish for PhD candidates has diverted the focus on pushing the knowledge boundary to publish weaker and less well-thought-through papers, sometimes at the cost of research integrity.³¹ Against this backdrop, the Chinese government has issued policies to improve the quality aspect of doctoral education and research (e.g. establish a quality assurance system, apply stricter quality control measures, include in the evaluation system criteria for innovation and breakthrough of research findings, not just quantity of publication). In 2019, Tsinghua University, one of the leading DFC universities, also joined the shift by eliminating the requirement that PhD candidates must publish to graduate to give them the freedom to pursue academic exploration rather than to meet rigid and short-term publication requirements.³²

³⁰ The Ministry of Education, the Ministry of Finance, and the National Development and Reform Commission (2018). "Guiding Opinions on Accelerating the Construction of "Double First-Class"

³¹Over the past two decades, the number of Chinese research publications has increased sharply, along with the number of academic integrity violations (e.g. plagiarism, fraud, use of research article writing services, etc.) also increased (Tang, 2019; Jia, 2017). Tang, Li (2019). *Five ways China must cultivate research integrity*. Nature 575: 589-591. Jia, Hepeng (2017). *Retractions pulling China back*. Nature index. <https://www.natureindex.com/news-blog/call-for-tougher-sanctions-in-response-to-growth-in-papers-recalled-for-misconduct>. Retrieved April 03, 2023.

³² Nerad, M. at. al. (eds) (2022). *Towards a Global Core Value System in Doctoral Education*. London: UCL Press.

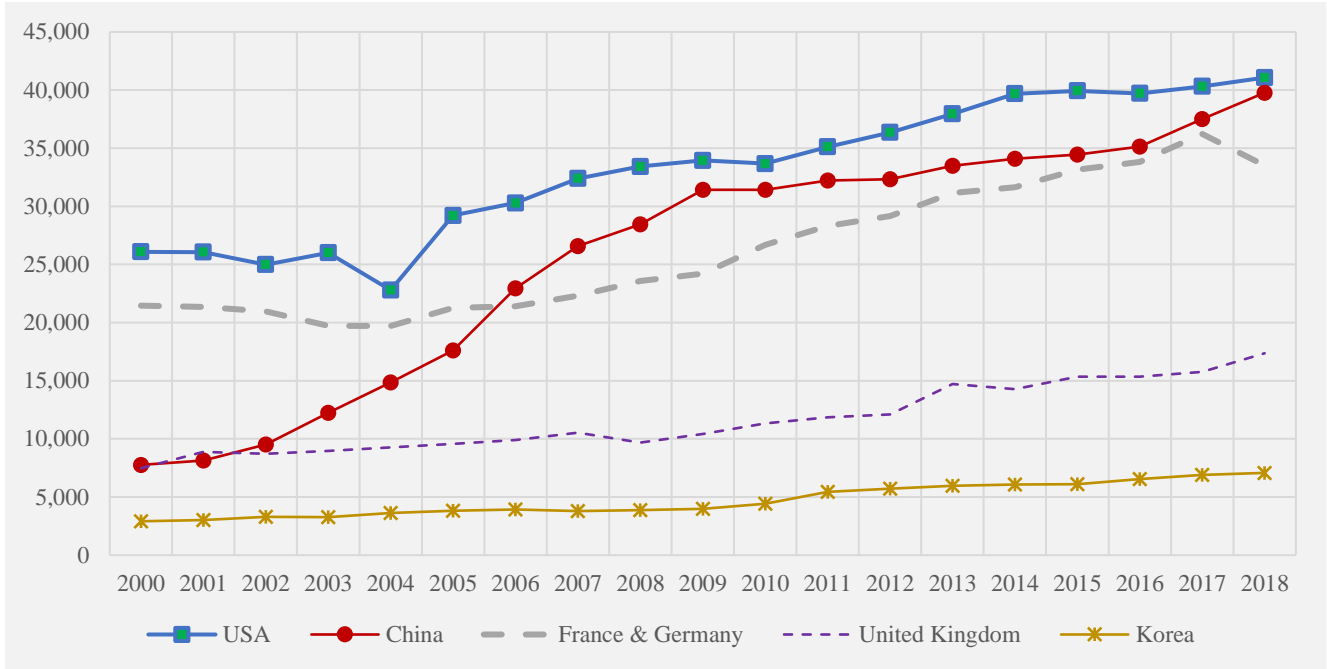


Figure 8: Science & engineering doctoral degrees, by countries, 2000 - 2018

Source: US National Science Foundation - Science and Engineering Indicators

Annex 4 – Vietnam’s initiatives in financing research & development

It is important to underscore that the success of the research capacity-building efforts for universities is highly dependent on the Vietnamese Government’s ability to significantly increase the research budget, protect the funding allocation process from political considerations and interferences, and maintain stable funding levels over the years. Vietnam may consider enhancing the mixed use of two approaches, namely (i) integrated training and research financing and (ii) competitive financing.

Combined funding for teaching and research. Most countries employ this common and traditional approach to financing on-campus research, where universities use publicly available resources to conduct research and pay for academic and institutional activities. Joint funding for education and research, through a negotiated budget or formula-based funding, has the strength of being the research funding method most likely to integrate teaching and research. Its downside is that the government has very little time to influence research directions or the effective use of funding.

In 2022, MOST approved a number of national mission-/solution-oriented R&D or scientific research programs, both ensuring that the Government has a clear vision for research work towards addressing pressing socio-economic issues while integrating training and research.

In addition, these programs all require that 50-100% of the projects should incorporate training of postgraduate programs, including masters and doctoral programs. Some further set specific requirements in doctoral training, targeting at least 10-20% of projects to be funded.

Some of the programs are listed below:

- (1) Decision No. 1217/QD-BKHHCN in 2022 approving the national S&T program to 2030 titled "Research, application and development of energy technology", code: KC.05/21-30 issued by MOST Minister;
- (2) Decision No. 1253/QD-BKHHCN in 2022 approving the national S&T program to 2030 titled "Research, application and development of biotechnology", code: KC.12/21-30 issued by MOST Minister;
- (3) Decision No. 1002/QD-BKHHCN in 2022 approving the national S&T program to 2030 titled "Research, development and application of information technology for the development of digital government and smart cities", code: KC.01/21-30 issued by MOST Minister;
- (4) Decision No. 1033/QD-BKHHCN in 2022 approving the national S&T program to 2030 titled "Scientific and technological research for environmental protection, disaster prevention and response to climate change", code: KC.08/21-30 issued by MOST Minister;
- (5) Decision No. 1034/QD-BKHHCN in 2022 approving the national S&T program to 2030 titled "Scientific and technological research for sustainable development of the marine economy", code: KC.09/21-30 issued by MOST Minister;

Competitive financing. This is one of the most common ways of allocating public resources for research. Faculty members apply for grants for specific research projects, which are provided based on peer review of proposals. By measuring the quality and potential of proposals objectively, the process is somewhat insulated from political pressures.

A practical example of competitive financing implemented in Vietnam is from the project “Fostering Innovation through Research, Science and Technology” (FIRST project financed by the World Bank loan).³³ The project effectively funded public research institutes and universities in priority areas identified in Law on High Technologies No. 21/2008/QH12, which are: (i) Information, Communication, and Technology (ICT); (ii) Biotechnology and agriculture; (iii) New materials and (iv) Mechanical engineering and automation. In addition, priority is also given to such areas as geodesy, cartography, hydrometeorology, environmental protection and climate change. Of the granted projects, funds from the FIRST project financed an average of 44% of the total research expenses and the beneficiaries, including HEIs, research institutes, enterprises or alliances between these entities - covered the rest (56%).

The FIRST project’s calls for appraisal and approval of research funding were on a competitive basis. Accordingly, its Project Management Unit actively called for proposals from science, technology and innovation institutions on a competitive basis. In four years of implementation from 2016 to 2019, there were 03 calls for proposals, engaging 328 funding applicants, signing 77 financing agreements and implementing 67 financing agreements. The project adopted an active and broad-based communication strategy to attract competitive funding proposals, with a series of activities for sustainable professional management to invite competitive proposals.

³³Final report of the project “Fostering Innovation through Research, Science and Technology (FIRST)” by the FIRST Project Management Unit, 2020