

COST AND RETURN OF AN INTERNATIONAL STUDY PROGRAM IN A DEVELOPING COUNTRY: A CONTEXT OF STRATEGY

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Abstract

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Higher education has long been viewed as a catalyst for personal advancement and national economic growth, particularly in developing regions (Pal, 2023). This study examined the financial viability and return on investment (ROI) of higher education in developing countries, with a focus on assessing whether the costs are justified by the expected economic benefits. The research analyzed data collected from multiple sources, including government reports, educational institutions, and international databases covering several countries in Southeast Asia and Sub-Saharan Africa. The methodology applied cost-benefit analysis (CBA) principles, utilizing financial metrics such as net present value (NPV) and internal rate of return (IRR) to evaluate the economic returns of higher education investments. The study finds that although initial education costs impose a substantial burden on students and governments, the long-term earnings potential for graduates generally offsets these expenditures. Specifically, postgraduate degrees tend to yield a higher ROI than bachelor's degrees, with master's graduates typically recovering their investments within approximately seven years, compared to nine years for bachelor's graduates. These findings underscore the importance of investing in advanced degrees to promote economic development and suggest that policies enhancing access to higher education can significantly improve national economic outcomes in these regions.

Keywords: Economic Returns, Higher Education Investment, Cost-Benefit Analysis

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1. INTRODUCTION

Education is widely recognized as a cornerstone of human development, offering transformative opportunities to enhance skills, knowledge, and capabilities. Its impact extends far beyond individual growth, serving as a critical driver of organizational success, national competitiveness, and global progress. Investments in education and lifelong learning create a more skilled and adaptive workforce, capable of meeting the demands of a rapidly evolving world. Thailand has prioritized education as a means of empowering its people and achieving sustainable development. Recognizing the transformative potential of a skilled and knowledgeable workforce, the Thai government has made significant strides to improve the quality of its education system. These efforts include expanding access to education at all levels, from early childhood through higher education, and ensuring inclusivity by extending opportunities to regional and underserved areas. Both public and private educational institutions have played vital roles in shaping the nation's academic landscape. Government policies have emphasized raising educational standards to align with global benchmarks, reflecting the ambition to make Thailand's workforce competitive on an international scale. The role of education has become increasingly vital in the digital economy, where technological advancements continuously reshape industries and job markets. This era, characterized by technological disruption, has heightened the need for a workforce equipped with diverse and specialized skills. For Thailand to remain resilient in this environment, it must focus on cultivating lifelong learning and fostering adaptability among its people. Technological disruption — driven by advancements in artificial intelligence (AI), automation, and digital connectivity — has fundamentally altered the global economic landscape. Jobs that once relied on routine tasks are increasingly being replaced by technology, while demand surges for roles requiring critical thinking, creativity, and emotional intelligence (Huyen et al., 2024; Morris et al., 2020; Limna, 2023; Limna et al., 2023; Limna & Kraiwanit, 2024; Namraksa & Kraiwanit, 2024; Pal, 2023; Rafiyya et al., 2024; Sanglimsuwan & Songwathana, 2024; Siripipatthanakul et al., 2022; Siripipatthanakul et al., 2025).

This paradigm shift underscores the necessity of rethinking education systems to prepare individuals for the future of work. In Thailand, integrating digital literacy, science, technology, engineering, and mathematics (STEM) education, and soft skills into curricula has become a strategic priority. Educational institutions are also exploring innovative teaching methods, such as blended learning and online platforms, to enhance accessibility and effectiveness. Education offers numerous benefits across various sectors. For the workforce, it provides individuals with the opportunity to pursue careers that align with their interests and skills, while also offering flexibility in moving between companies and industries. Employers benefit from a more productive workforce and increased innovation within their organizations. On a societal level, education promotes social mobility, where the children of well-educated parents are more likely to achieve higher education themselves, leading to better job security and income. This ultimately helps reduce poverty and lower crime rates. Furthermore, education contributes to creating a more equitable

society by encouraging active participation in social discussions, advocating for human rights, and supporting gender equality. This is especially evident in younger generations, who are more confident in expressing their opinions and standing up for their beliefs. International schools in Thailand are witnessing significant growth, despite a broader trend of declining student enrollment due to falling birth rates. Between 2012 and 2024, the number of births in Thailand decreased at an average annual rate of 4.5%, leading to a 0.9% drop in the total student population. Yet, international schools have grown their student base by 6.9% annually during the same period. This divergence is driven by several key factors. Firstly, the increasing number of expatriates working in Thailand, particularly in executive roles, has contributed to the rise in international student enrollments, with a steady 0.6% yearly growth in foreign professionals over the past decade. Secondly, the modernized curricula offered by international schools have gained popularity over traditional Thai systems, appealing to parents seeking globally relevant education. Additionally, the growing wealth of Thai households has played a pivotal role. The number of high-net-worth individuals in Thailand, defined as those possessing assets over \$1 million, is projected to grow by 24% from 2023 to 2028, enabling more families to afford international schooling. In contrast, public and private Thai curriculum schools have faced challenges, with closures averaging 0.6% and 0.7% per year, respectively. Meanwhile, the number of international schools has grown by 5% annually, reflecting a shifting preference for foreign educational systems. This trend underlines the increasing demand for global educational opportunities and the evolving priorities of Thai families aiming to equip their children for competitive international futures (K-Research, 2024). International education programs hold significant potential for developing human capital, especially in developing countries. However, the role of such programs in driving economic growth remains underexplored. While existing literature extensively examines the relationship between education, human capital, and economic outcomes, it often overlooks the specific contribution of international education investments. Moreover, most studies fail to provide a detailed cost-benefit analysis (CBA), particularly concerning the long-term financial returns for individuals and the broader economy. Studying at international schools in Thailand offers unique and valuable opportunities for building professional networks. For instance, students enrolled in international business programs often interact with individuals from diverse industries, which provides a significant advantage in establishing connections that can enhance future career prospects (Samrit, 2017). Therefore, pursuing education at an international school is a strategic investment, offering substantial returns such as access to roles in top-tier companies, competitive salaries, and long-term career advancement.

To bridge these gaps, this study focuses on the financial implications of international education, analyzing factors such as tuition fees, related costs, and career earnings across professional trajectories. The aim is to provide a robust conceptual framework that integrates financial modeling with theories of human capital development. By addressing these overlooked aspects, the research contributes to a deeper understanding of how international education can enhance economic mobility,

workforce competitiveness, and innovation in developing nations. Additionally, the findings offer valuable insights for policymakers and stakeholders in prioritizing investments in education for sustainable economic growth.

The structure of this paper is as follows. Section 1 provides the foundation for the study. Section 2 presents a review of the relevant literature. Section 3 outlines the research methodology. Section 4 reports the study's findings. Section 5 discusses the implications of the findings. Finally, Section 6 summarizes the study's conclusions, highlights its limitations, and offers recommendations for future research.

2. LITERATURE REVIEW

Education is a foundational investment in human development, enhancing individuals' skills, knowledge, and abilities. This growth contributes significantly to both personal achievements and organizational success. For organizations, prioritizing employee training, skill development, and personal growth translates to improved efficiency, long-term competitiveness, and adaptability in dynamic markets (Bau et al., 2020; Goldin, 2024). Human capital is also essential for societal and economic engagement, spanning cultural, political, and economic domains, thereby emphasizing the need for consistent improvements in quality and efficiency. At a macro level, human capital drives sustained economic growth by fostering innovation and enhancing productivity through skilled labor. Unlike physical capital, which experiences diminishing returns, human capital offers limitless growth potential. This underscores the necessity of continuous investment in education and workforce development as drivers of long-term economic progress (Goldin, 2024). On a microeconomic level, education and work experience, proxies for human capital, play a decisive role in determining employment prospects and earning potential. Numerous studies demonstrate a direct correlation between higher educational attainment and increased economic returns, validating education's role in fostering upward mobility and individual success (Kuzmin et al., 2020). These findings collectively highlight the multifaceted impact of education as a cornerstone for both individual advancement and national economic development (Giustinelli, 2022).

This includes income from the employment of graduates and salary growth rates. Both systems have a salary growth rate of 7% per year, based on the civil service salary increase rate of 5-10% for the years 2023-2024 from the Thai government, and this study used 7% (Namraksa et al., 2025). Numerous studies have concentrated on the private economic returns across different education levels, with a strong emphasis on higher education (Patrinos et al., 2021). These findings reinforce the notion that investing in education significantly enhances private economic returns, suggesting that higher education plays a crucial role in elevating living standards and fostering economic growth at both individual and national levels.

Kasnauskiene et al. (2024) demonstrate that Lithuania's investments in education generate significant financial benefits for individuals and society. The study reveals that low education costs paired with high returns yield net present values (NPV) of €126,000 to €224,000 per individual and internal rates of return (IRR) between 7% and 46%. The highest returns are linked to males with bachelor's degrees employed in medium-sized companies.

Additionally, each extra year of education boosts average earnings by 4.1%. The research also finds that undergraduate programs are more cost-effective for the state than graduate and postgraduate studies, costing approximately half as much. Consequently, first-cycle education has higher NPV and IRR, highlighting its superior economic efficiency and impact. The study by Samlee et al. (2022) focuses on analyzing the costs and returns of educational investment for students in the Faculty of Management Technology at Rajamangala University of Technology Srivijaya, Nakhon Si Thammarat Campus (Sai Yai). The research evaluates the financial viability of pursuing education in this program by examining metrics such as NPV, return on investment (ROI), and IRR. Key findings indicate that investing in education within this faculty is worthwhile, as the analyzed indicators exceed the established thresholds, confirming the long-term financial benefits. The study also highlights that education significantly influences future income potential, with higher levels of education linked to better employment opportunities and higher salaries compared to individuals with lower educational attainment. According to Equitable Education Fund (EEF, 2022), investing in education in Thailand not only boosts the average income of young people but also directly enhances the quality of life in households. This investment increases the number of individuals contributing to the tax base, as those earning over 26,583 Baht per month qualify as taxpayers under current regulations. Moreover, it generates substantial economic returns at the national level, estimated at 66 billion Baht, representing a return seven times higher than the initial costs. This transformative impact also positions Thailand closer to achieving high-income country status in the future. The reviewed research highlights the significant role of education in promoting economic growth and personal financial returns. Namraksa and Kraiwanit (2024) emphasize that education strengthens economies by enhancing workforce skills and shows a positive link between public education spending and economic growth. For example, in developed countries, a 1% increase in education spending correlates with over a 1% rise in economic growth, slightly less in Europe. Mitra (2019) confirms that higher levels of education yield greater returns, using methods like IRR and earnings functions. Bashir and Siddique (2023) examine the economic returns of Ph.D. degrees compared to non-Ph.D. degrees. They find that domestic Ph.D. holders experience 46.5% higher lifetime economic returns than non-Ph.D. faculty members, while foreign Ph.D. holders earn 29.8% more. However, foreign degree holders' net returns are 16.7% lower than domestic Ph.D. holders due to the higher costs of obtaining a degree abroad. Their sensitivity analysis reveals that changes in retirement age (from 60 years old to 55 years old or 65 years old) influence the difference in returns, with a retirement age of 55 years old reducing the gap and 65 years old increasing it. Additionally, extending the time required to complete a Ph.D. negatively impacts net lifetime economic returns. Afzal et al. (2015) find that public sector financial institution employees benefit more from educational investments than those in the private sector, with returns of 15.4% and 12%, respectively. Lastly, Khan (2021) confirms that higher education yields the highest economic returns among all education levels in Pakistan, bolstering individual earnings and economic growth overall.

3. RESEARCH METHODOLOGY

This study evaluates the financial viability of investing in international education by analyzing the long-term economic returns for individuals. A quantitative research approach was employed due to its capacity for systematic, empirical analysis using statistical tools (Limna, 2025; Shaengchart et al., 2025). The methodology integrates financial metrics such as *NPV*, *IRR*, and benefit-cost ratio (*BCR*) to assess the private benefits of educational investments. Data were collected from both primary and secondary sources, including educational institutions, labor market reports, and relevant government agencies. The cost structure includes direct educational expenses such as tuition fees, service fees, and technology-related costs, with tuition data sourced from the International Education Association of Thailand for the fiscal year 2024. Additionally, opportunity costs — reflecting foregone earnings during the study period — were considered to capture the full economic burden on individuals. ROIs were estimated based on projected post-graduation earnings. For bachelor's degree holders in the social sciences and master's degree holders, income was calculated from age 24 years old to 60 years old. Salary projections were based on net income after taxes and assumed to increase annually by 4.64%, without a salary cap, following data from the Thailand Personnel Management Association in 2024. This framework provides a comprehensive view of the lifetime economic outcomes associated with international educational investment.

CBA of educational investment is an important process for investment decision-making, helping investors assess whether to proceed with the investment or not. Key tools for this analysis include calculating the *NPV*, *BCR*, and *IRR*, with the “discount rate” or “opportunity cost of capital” being a critical factor. In developing countries, the discount rate is typically assumed to range between 8–15%. The discount rate refers to the rate used to calculate the *ROI* by applying an average annual discount rate of 7.5% (based on the interest rate of loans from Krung Thai Bank as of September 2024). The criteria for determining whether a project should proceed are as follows:

NPV is a financial metric that represents the difference between the present value of cash inflows and the present value of cash outflows, discounted by a specific rate over time. In the context of educational investment, this method accounts for both the costs associated with acquiring education and the lifetime earnings that result from it. If the *NPV* is positive ($NPV > 0$), this indicates a positive return on the educational investment, meaning the benefits outweigh the costs. Conversely, if *NPV* is negative ($NPV < 0$), the *ROI* is negative, signaling that the costs exceed the benefits. When *NPV* equals zero ($NPV = 0$), it indicates that there is neither a profit nor a loss from the investment. The *NPV* calculation is typically derived using the following equation:

$$NPV = \sum \frac{R_t}{(1+r)^t} - C_0 \quad (1)$$

where,

- R_t is the net cash inflow during the period t ;
- r is the discount rate;
- t is the time period;
- C_0 is the initial investment cost.

BCR is a financial metric used to assess the value of an investment or project by comparing its expected benefits to its costs. The formula for calculating *BCR* is as follows:

$$BCR = \frac{PVC}{PVB} \quad (2)$$

Present value of benefits (*PVB*): The total value of all projected benefits from the investment, discounted to their present value using a selected discount rate.

Present value of costs (*PVC*): The total costs associated with the investment, similarly discounted to their present value.

If $BCR \geq 1$, the investment is considered viable, as benefits outweigh or equal costs.

If $BCR < 1$, the investment may not be economically viable, as costs exceed benefits.

IRR is the discount rate at which the *NPV* of an investment becomes zero. It is often used to evaluate the profitability of a project or investment. *IRR* can be calculated using iterative methods or financial tools, as there is no straightforward formula to compute it directly.

$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+r)^t} = 0 \quad (3)$$

where,

- CF_t = cash flow at time t (inflows or outflows);
- r = internal rate of return (*IRR*);
- t = time period;
- n = total number of time periods.

If $IRR > \text{discount rate}$, the investment is considered profitable.

If $IRR = \text{discount rate}$, the project breaks even.

If $IRR < \text{discount rate}$, the investment is unprofitable.

The *payback period* is the time it takes for an investment to recover its initial cost from its cash inflows. It is a simple way to assess the risk and liquidity of a project.

$$\text{Payback period} = \frac{\text{Initial investment cost}}{\text{Annual cash inflows}} \quad (4)$$

This study's methodology provides a systematic framework for assessing the financial feasibility of international education through rigorous CBA. By incorporating key financial indicators — *NPV*, *IRR*, *BCR*, and *payback period* — and utilizing both primary and secondary data sources, the approach enables a clear evaluation of the long-term economic returns relative to educational costs. This method not only quantifies the private benefits of international study programs but also offers evidence-based insights to support strategic educational investment decisions in developing countries.

4. RESULTS

Based on a primary data survey using questionnaires distributed to international graduates in Thailand, as detailed in the Appendix, a total of 1,230 responses were collected. The research was divided into two dimensions: 1) bachelor's degree graduates in social sciences, and 2) master's degree graduates in social sciences.

Table 1. Education investment model: International curriculum cost (Baht)

Education level	Duration (years)	Tuition fees	Technology costs	Total costs
Kindergarten	3	461,250	49,050.00	510,300.00
Primary school	6	1,530,000	103,590.00	1,633,590.00
Lower secondary	3	705,000	54,306.00	759,306.00
Upper secondary school	3	847,500	64,782.00	912,282.00
Bachelor's degree (social sciences)	4	755,000	312,600.00	1,067,600.00
Total	19			4,883,078.00

Table 1 outlines the total cost of an education investment model based on an international curriculum over 19 years. The costs are broken down by educational level, detailing the duration in

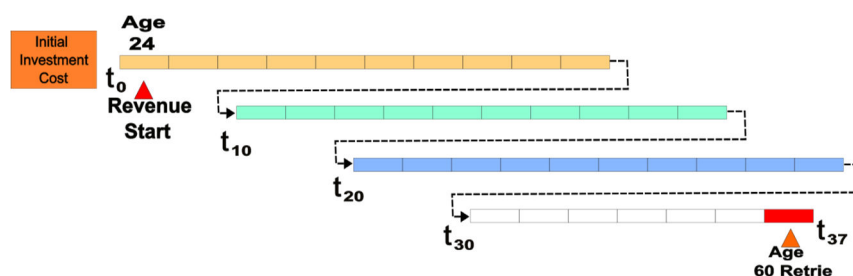
years, tuition fees, technology costs, and the overall total costs for each level of education. The total cost for all 19 years of education in this model amounts to 4,883,078 Baht.

Table 2. Calculates the expected revenue over a career (Bachelor's degree graduates in social sciences)

Age at start of work (years)	Working period (years)	Expected income/month	Expected income per year
24 years old	1	40,000.00	480,000.00
25 years old	2	41,856.00	502,272.00
26 years old	3	43,798.12	525,577.42
27 years old	4	45,830.35	549,964.21
28 years old	5	47,956.88	575,482.55
29 years old	6	50,182.08	602,184.94
30 years old	7	52,510.53	630,126.32
31 years old	8	54,947.02	659,364.19
32 years old	9	57,496.56	689,958.68
33 years old	10	60,164.40	721,972.77
34 years old	11	62,956.03	755,472.30
35 years old	12	65,877.18	790,526.22
36 years old	13	68,933.89	827,206.63
37 years old	14	72,132.42	865,589.02
38 years old	15	75,479.36	905,752.35
39 years old	16	78,981.61	947,779.26
40 years old	17	82,646.35	991,756.22
41 years old	18	86,481.14	1,037,773.71
42 years old	19	90,493.87	1,085,926.41
43 years old	20	94,692.78	1,136,313.39
44 years old	21	99,086.53	1,189,038.34
45 years old	22	103,684.14	1,244,209.71
46 years old	23	108,495.09	1,301,941.05
47 years old	24	113,529.26	1,362,351.11
48 years old	25	118,797.02	1,425,564.20
49 years old	26	124,309.20	1,491,710.38
50 years old	27	130,077.15	1,560,925.74
51 years old	28	136,112.72	1,633,352.70
52 years old	29	142,428.36	1,709,140.26
53 years old	30	149,037.03	1,788,444.37
54 years old	31	155,952.35	1,871,428.19
55 years old	32	163,188.54	1,958,262.46
56 years old	33	170,760.49	2,049,125.83
57 years old	34	178,683.77	2,144,205.27
58 years old	35	186,974.70	2,243,696.40
59 years old	36	195,650.33	2,347,803.91
60 years old	37	204,728.50	2,456,742.01
Total			45,058,940.55

Table 2 outlines the projected lifetime income of an individual starting work at the age of 24 years old with a monthly salary of 40,000 Baht, assuming an annual salary increase of 4.64%. In the first year, the individual earns 480,000 Baht annually, with the salary increasing to 41,856 Baht per month (502,272 Baht per year) in the second year due to

the 4.64% adjustment. By the 37th year of employment, the individual's monthly income rises to 204,728.50 Baht, equating to 2,456,742.01 Baht annually. Over the entire 37-year career span, the total cumulative income reaches approximately 45.05 million Baht.

Figure 1. The duration of employment and income for bachelor's degree graduates

Source: Authors' elaboration.

Figure 1 shows the duration of employment and income for bachelor's degree graduates starting from the age of 24 years old and working until retirement at the age of 60 years old, resulting in a total working period of 37 years old.

Table 3. CBA of individual educational investment (Bachelor's degree graduates in social sciences)

<i>Financial analysis</i>	<i>Results</i>
Initial investment cost	4,883,078.00
Discount rate (%)	7.50
NPV	5,711,743.12
IRR (%)	14.07
BCR	2.17
Payback period (year)	9

From Table 3, the analysis of the costs and personal returns on international educational investment demonstrates that the investment is worthwhile, as the NPV is greater than 0. The NPV

of 5,711,743.12 indicates that the project is likely to generate positive returns over the 37-year period, even when accounting for the time value of money. The IRR at 14.07% is higher than the *discount rate*, supporting the possibility of profitability. However, the BCR of 2.17 is concerning, as it shows that the benefits of the project compared to its costs are lower than 1. A BCR under 1 typically suggests that the investment may not be economically sustainable in the long term, as the costs outweigh the expected benefits. Despite the positive NPV and IRR reflecting some potential for profitability, the low BCR still warrants further evaluation. It may be necessary to consider revised benefits or reduce cost structures to improve the outcome. This indicates it would take nine years for the individual to recover their initial investment through earnings. This relatively long payback period reflects a slower ROI compared to other potential financial commitments.

Table 4. Education investment model: International curriculum cost (Baht, master's degree graduates in social sciences)

<i>Education level</i>	<i>Duration (years)</i>	<i>Tuition fees</i>	<i>Technology costs</i>	<i>Total costs</i>
Kindergarten	3	461,250	49,050.00	510,300.00
Primary school	6	1,530,000	103,590.00	1,633,590.00
Lower secondary	3	705,000	54,306.00	759,306.00
Upper secondary school	3	847,500	64,782.00	912,282.00
Bachelor's degree (social sciences)	4	755,000	312,600.00	1,067,600.00
Master's degree	2	531,000.00		531,000.00
Total	21			5,414,078.00

Table 4, the total costs associated with an international curriculum education model spanning 21 years. The total investment for

a student from kindergarten through a master's degree is 5,414,078 Baht, including both tuition and technology costs.

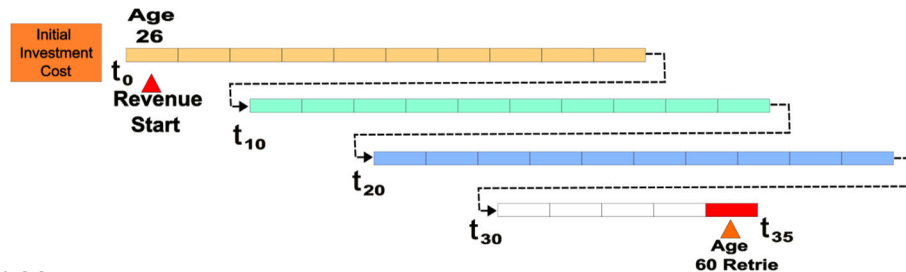
Table 5. Calculates the expected revenue over a career (Master's degree graduates in social sciences)

<i>Age at start of work (years)</i>	<i>Working period (years)</i>	<i>Expected income/month</i>	<i>Expected income per year</i>
26 years old	1	62,500.00	750,000.00
27 years old	2	65,400.00	784,800.00
28 years old	3	68,434.56	821,214.72
29 years old	4	71,609.92	859,319.08
30 years old	5	74,932.62	899,191.49
31 years old	6	78,409.50	940,913.97
32 years old	7	82,047.70	984,572.38
33 years old	8	85,854.71	1,030,256.54
34 years old	9	89,838.37	1,078,060.44
35 years old	10	94,006.87	1,128,082.45
36 years old	11	98,368.79	1,180,425.47
37 years old	12	102,933.10	1,235,197.22
38 years old	13	107,709.20	1,292,510.37
39 years old	14	112,706.90	1,352,482.85
40 years old	15	117,936.50	1,415,238.05
41 years old	16	123,408.76	1,480,905.10
42 years old	17	129,134.92	1,549,619.09
43 years old	18	135,126.79	1,621,521.42
44 years old	19	141,396.67	1,696,760.01
45 years old	20	147,957.47	1,775,489.68
46 years old	21	154,822.70	1,857,872.40
47 years old	22	162,006.47	1,944,077.68
48 years old	23	169,523.57	2,034,282.88
49 years old	24	177,389.47	2,128,673.61
50 years old	25	185,620.34	2,227,444.06
51 years old	26	194,233.12	2,330,797.47
52 years old	27	203,245.54	2,438,946.47
53 years old	28	212,676.13	2,552,113.59
54 years old	29	222,544.30	2,670,531.66
55 years old	30	232,870.36	2,794,444.33
56 years old	31	243,675.55	2,924,106.54
57 years old	32	254,982.09	3,059,785.09
58 years old	33	266,813.26	3,201,759.12
59 years old	34	279,193.39	3,350,320.74
60 years old	35	292,147.97	3,505,775.62
Total			62,897,491.60

Table 5, the expected revenue after completing education, based on a monthly salary starting at 62,500 Baht at the age of 26 years old. The revenue grows annually at a rate of 4.64%, with the annual income increasing each year as the individual progresses through their career. At age 26 years old,

the person earns 62,500 Baht per month, which totals 750,000 Baht per year. By the time they reach 60 years old, their monthly salary has grown to 292,147.97 Baht, resulting in an annual income of 3,505,775.62 Baht. The total expected revenue for those over 35 years old is 62,897,491.60 Baht.

Figure 2. The duration of employment and income for master's degree graduates



Source: Authors' elaboration.

Figure 2 shows the duration of employment and income for master's degree graduates starting from the age of 26 years old and working until retirement at the age of 60 years old, resulting in a total working period of 35 years old.

Table 6. CBA of individual educational investment (Master's degree graduates in social sciences)

Financial analysis	Results
Initial investment cost	5,414,078.00
Discount rate (%)	7.50
NPV	10,604,544.15
IRR (%)	18.30
BCR	2.96
Payback period (year)	7

The CBA of an individual educational investment indicates positive financial prospects. The initial investment of 5,414,078.00 Baht leads to an impressive NPV of 10,604,544.15 Baht, highlighting that the investment yields a significant return when adjusted for the time value of money. Furthermore, the IRR of 18.30% surpasses the discount rate of 7.5%, reinforcing the investment's profitability. The BCR of 2.96 suggests that for every Baht invested, the return exceeds the initial cost, confirming the economic feasibility of this educational investment. These results suggest that investing in education can offer substantial financial benefits in the long run, particularly when considering factors like the long-term return and profitability shown through the NPV and IRR metrics. The seven-year payback period demonstrates the efficiency of the investment, making it an attractive option for those seeking to enhance their earning potential through education.

5. DISCUSSION

The research on the CBA of educational investment in international programs highlights the financial viability of such an investment in monetary terms, providing critical data to support decision-making regarding further education. The findings reveal that educational investment, particularly in international programs, proves to be worthwhile in the long term. This conclusion aligns with personal rate-of-return criteria, meeting thresholds for NPV, BCR, and IRR, all of which exceed established benchmarks. Consequently, these programs are deemed a sound investment.

However, the high initial cost of education, such as a total expenditure of 4,883,078 Baht, poses significant financial challenges for learners in developing countries, particularly for low-income families. These findings align with prior studies (Psacharopoulos & Patrinos, 2018), which identify education costs as a major barrier to access in low- and middle-income countries.

The extended payback period, often a feature of such investments, presents additional challenges, particularly for students and families in developing economies, where securing funding for education is already constrained. Delayed returns can deter investment in education. Nonetheless, the lifetime present value of income for master's degree holders surpasses that of bachelor's degree holders, supporting Bashir and Siddique (2023), who found that postgraduate degree holders earn, on average, 29.8% more than non-doctoral faculty. Similarly, Khan (2021) revealed that higher education yields greater economic returns compared to all other levels of education, based on studies of Pakistan's higher education outcomes. These findings underline the importance of policy and financial support to bridge gaps in accessibility while emphasizing the significant long-term benefits of international education programs in developing regions. Higher education is essential for better career prospects and higher income. According to Yubilianto (2020), an analysis of the return on higher education in Indonesia using the full discounting method and data from the Indonesia family life survey (IFLS-5) and synthetic work-life earnings (SWE) estimation reveals that college graduates earn, on average, 60% more than secondary school graduates. This implies that the ROI in higher education is approximately 15% per year, which aligns with findings from the Mincer earnings equation. However, it takes at least 14 years of work to recover the costs of obtaining a bachelor's degree. These results suggest that households should carefully consider investing in university education, and governments and financial institutions should provide better loan policies to support access to higher education.

While monetary returns are a central focus in most studies, including factors such as social mobility, health outcomes, and social benefits of education, could provide a more holistic picture of its value. Many studies focus on income, but the broader benefits of education are equally important, especially in the context of societal

development and equality. Given the high cost of higher education, especially in developing countries, policymakers and financial institutions should consider ways to make higher education more accessible. This could include offering lower interest rates on educational loans, providing scholarships, or creating more partnerships between universities and industries to offer job-placement-based funding. This would help reduce the financial burden on students and families, making education a more feasible investment.

6. CONCLUSION

This analysis explores the financial dynamics of educational investment costs and the associated returns for individuals pursuing higher education, particularly in developing countries. The total cost of education for a student reaching a bachelor's degree is 4,883,078 Baht, covering all educational stages from kindergarten to university, with the highest expenses occurring at the university level, both for undergraduate and graduate studies.

Regarding income accumulation, individuals completing a bachelor's degree and working until age 60 years old (37 years of employment) are projected to accumulate 45,058,940.55 Baht in total income. This amount significantly increases for individuals with a master's degree, reaching 62,897,491.60 Baht over 35 years. These figures demonstrate the substantial financial benefits of higher education, particularly postgraduate education.

Several financial metrics were applied to assess the return on educational investment. The NPV for a bachelor's degree holder stands at 5,711,743.12 Baht, reflecting a positive return. For master's degree holders, however, the NPV rises to 10,604,544.15 Baht, indicating a more substantial financial return. The IRR for a bachelor's degree is 14.07%, while for master's degree holders, it jumps to 18.30%, further underscoring the higher return associated with advanced education.

The BCR for a bachelor's degree is 2.17, meaning that the returns fall short of the initial investment. In contrast, the BCR for a master's degree is 2.96, suggesting that the returns significantly exceed the investment, making it a more financially advantageous option. Moreover, the payback period, which measures how long it takes to recover the initial educational investment, is nine years for a bachelor's degree but only seven years for a master's degree, indicating a faster financial recovery for those with advanced degrees.

In conclusion, the findings of this study indicate that higher education, especially at the master's level, offers a highly valuable ROI. Despite the high initial costs, the long-term financial gains from a master's degree are considerable. The shorter payback period for master's degree holders enhances the financial attractiveness of this educational investment. These results align with previous research emphasizing the significant economic benefits of higher education in terms of lifetime income.

This study has several limitations, including its primary focus on financial returns while overlooking non-financial benefits such as skill development and career advancement. It relies on projected salary increments, which may not fully capture economic fluctuations or job market uncertainties. Additionally, the findings are based on a developing country, limiting generalizability, and qualitative perspectives from students and employers were not included. Future research should adopt a more holistic approach by integrating qualitative insights, conducting cross-country comparisons, and employing longitudinal studies to track actual career progression. Moreover, exploring policy measures on educational funding and accessibility could provide valuable recommendations for improving higher education investment.

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APPENDIX. QUESTIONNAIRE**Section 1. General information of the respondent**

1. Gender:

- ☐ Male
☐ Female
☐ Prefer not to say

2. Age:

- ☐ 18–21 years old
☐ 22–25 years old
☐ 26–29 years old
☐ 30 years old and above

3. Have you completed an international education system in Thailand?

- ☐ Yes
☐ No
☐ Other (e.g., bilingual system)

4. Which international school/university have you studied at, located in which region?

- ☐ Central Region
☐ Northeastern Region
☐ Northern Region
☐ Eastern Region
☐ Southern Region
☐ Bangkok and surrounding areas

5. What level of social sciences have you graduated from?

- ☐ Doctorate (PhD)
☐ Master's degree
☐ Bachelor's degree
☐ Currently studying

6. Current occupation (if currently studying, please indicate your expected occupation):

- ☐ Private company employee
☐ Government employee/state enterprise staff
☐ Business owner/self-employed
☐ Freelance (e.g., website designer, mobile application developer, digital marketer)
☐ Startup
☐ Other (please specify)

Section 2. Income and expected income

7. What is your initial monthly income?

- ☐ Less than 25,000 Baht
☐ 25,001–50,000 Baht
☐ 50,001–75,000 Baht
☐ 75,001–100,000 Baht
☐ 100,001–125,000 Baht
☐ 125,001–150,000 Baht
☐ 150,001 Baht and above

8. What are your sources of income?

- ☐ Additional income
☐ No additional income

Section 3. Comments

9. How has technology helped you during your studies in the international education system?

10. What are your comments and suggestions regarding international education in the digital economy era?