# Financial statement analysis : A comparison between Bangkok Dusit Medical Services PCL, Bumrungrad Hospital PCL and Thonburi Healthcare Group PCL during COVID pandemic

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An Independent Study Submitted in Partial Fulfillment of the Requirements
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Field of Study of Business and Managerial Economics
FACULTY OF ECONOMICS
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# การวิเคราะห์ทางการเงิน: การเปรียบเทียบระหว่างบริษัท กรุงเทพดุสิตเวชการ จำกัด(มหาชน), บริษัท โรงพยาบาลบำรุงราษฎร์ จำกัด (มหาชน)และ บริษัท ธนบุรี เฮลท์แคร์ กรุ๊ป จำกัด (มหาชน) ในช่วงการแพร่ระบาดของโควิด 19

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| Thesis Advisor | Assistant Professor SAN SAMPATTAVANIJA, Ph.D. |

Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Arts

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พงษธร จุ้ยศรีแก้ว : การวิเคราะห์ทางการเงิน: การเปรียบเทียบระหว่างบริษัท กรุงเทพดุสิตเวชการ จำกัด(มหาชน), บริษัท โรงพยาบาลบำรุงราษฎร์ จำกัด (มหาชน)และ บริษัท ธนบุรี เฮลท์แคร์ กรุ๊ป จำกัด (มหาชน) ในช่วงการแพร่ระบาดของโควิด 19. ( Financial statement analysis : A comparison between Bangkok Dusit Medical Services PCL, Bumrungrad Hospital PCL and Thonburi Healthcare Group PCL during COVID pandemic) อ.ที่ปรึกษาหลัก : ผศ. ดร.สันต์ สัมปัตตะวนิช

ในช่วงระหว่างปี 2563 ถึง 2565 บริษัทหลายแห่งในธุรกิจต่างๆประสบปัญหาอย่างหนักอันเนื่องมาจากการระบาดของโควิด-19 และธุรกิจโรงพยาบาลก็เป็นหนึ่งในธุรกิจที่ได้รับผลกระทบตั้งแต่เริ่มมีการระบาดครั้งแรกในประเทศไทยเมื่อต้นปี 2563 ดังนั้นรายงานฉบับนี้จึงถูกจัดทำขึ้นเพื่อศึกษาผลกระทบอันเนื่องมาจากการระบาดของโควิด-19ต่อประสิทธิภาพทางการเงินของบริษัทที่ทำธุรกิจโรงพยาบาลเอกชนในไทย 3 บริษัทได้แก่ บริษัท กรุงเทพดุสิตเวชการ จำกัด(มหาชน), บริษัท โรงพยาบาลบำรุงราษฎร์ จำกัด (มหาชน) และ บริษัท ธนบุรี เฮลท์แคร์ กรุ๊ป จำกัด (มหาชน)ในช่วงเวลาดังกล่าว โดยใช้การวิเคราะห์อัตราส่วนทางการเงินเพื่อเปรียบเทียบประสิทธิภาพการทำงานใน 4 ด้าน ได้แก่ สภาพคล่อง ประสิทธิภาพ การทำกำไร และโครงสร้างทางการเงิน นอกจากนี้ยังวิเคราะห์สถิติการดำเนินงานของแต่ละบริษัทเพื่อหาสาเหตุที่แท้จริงของอัตราส่วนและประสิทธิภาพทางการเงินที่แตกต่างกันรวมถึงคาดการณ์อัตราส่วนการทำกำไรในอนาคตของแต่ละบริษัทด้วย

ผลการวิจัยพบว่าอัตราส่วนระหว่างผู้ป่วยไทยและผู้ป่วยต่างชาติ และภาระทางการเงินเป็นปัจจัยสำคัญสองประการที่มีอิทธิพลต่อประสิทธิภาพทางการเงินในช่วงวิกฤตโควิด บริษัทที่มีหนี้สินทางการเงินจำนวนมาก การจัดการต้นทุนที่ไม่ดี และอัตราส่วนระหว่างผู้ป่วยไทยและผู้ป่วยต่างชาติที่ไม่สมดุลนั้นจะมีความเสี่ยงที่จะสูญเสียรายได้และกำไรมาก ด้วยเหตุนี้เราจึงแนะนำให้โรงพยาบาลสร้างสมดุลระหว่างจำนวนผู้ป่วยไทยและผู้ป่วยต่างชาติ หลีกเลี่ยงการสร้างหนี้สินที่มากเกินไป และปรับปรุงการจัดการต้นทุนอย่างต่อเนื่อง นอกจากนี้ อีกทางเลือกหนึ่งสำหรับโรงพยาบาลในการบรรเทาปัญหาและปรับปรุงประสิทธิภาพทางการเงินคือการใช้การตัดสินใจเชิงกลยุทธ์เพื่อทำกำไรจากโอกาสที่มีในช่วงวิกฤต



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Many industries are suffering greatly because of the COVID pandemic, and the hospital industry is one of them that has been disrupted since the disease first spread in Thailand in early 2020. This study demonstrates the financial performance of three Thai healthcare firm groups, BDMS, BH, and THG, as a result of economic activities intervening on both the demand and supply sides.
This study will examine the financial performance of BDMS, BH, and THG during the COVID pandemic in Thailand, using financial ratio analysis to compare their performance in four areas: liquidity, efficiency, profitability, and leverage. Operational statistics analysis and financial forecasting reveal the ratio's underlying cause.

According to the findings, the care portfolio and financial burden are two key factors that influence financial performance. During a crisis, a company with a heavy financial debt, poor cost management, and an unbalanced care portfolio is vulnerable. As a result, we recommended hospitals to balance their care portfolios, avoid excessive debt, and constantly improve their cost management. In addition, one option for a company to alleviate the issue and improve their financial performance is to use a strategic move to profit from advantageous opportunities during the crisis.



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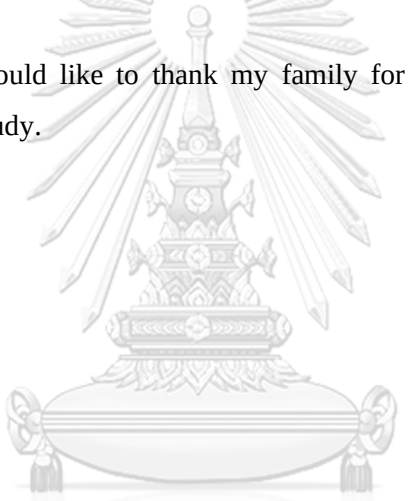

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# 1. **Introduction**

Hospital business is one of the businesses that many people are familiar with because hospitals provide services to almost everyone from the first day to the last day of their life, so that many people have already understood intuitively what hospital's products or services are so, there is no surprise that many investors are interested in investing in this sector. In Thailand, many private hospitals' stocks are traded in the healthcare sector of the stock exchange of Thailand (SET) and their stocks usually get the premium valuation from investors as from 2008 to 2018, the average P/E ratio[1] of healthcare sector stocks is 34 while the average P/E ratio of all stocks listed in SET is 14.This indicates that it is acceptable for many investors to buy healthcare stocks at the price which is 34 times of the earning per share.(Ekasamut, 2019, 15)

However, easy-to-understand products and services may not be the only reason why the healthcare stocks have been interested by investors for years. Historical data show us that there is no correlation between Thai GDP growth and the sales of the firms in healthcare sector (Ekasamut, 2019,9) which means that no matter GDP rose or declined, it did not affect the revenue of the firms in healthcare sector. As the red circle show in the figure below, even when the economy faced downturn, the sales of healthcare firm still grew. For examples, the 'Tom Yum Kung' financial crisis in 1997 (2540 B.E.) that shocked Thai economy as GDP growth dropped dramatically and the hamburger crisis in 2009 (2552 B.E.) that also caused a big decline of GDP growth did not affect the growth of healthcare sales.

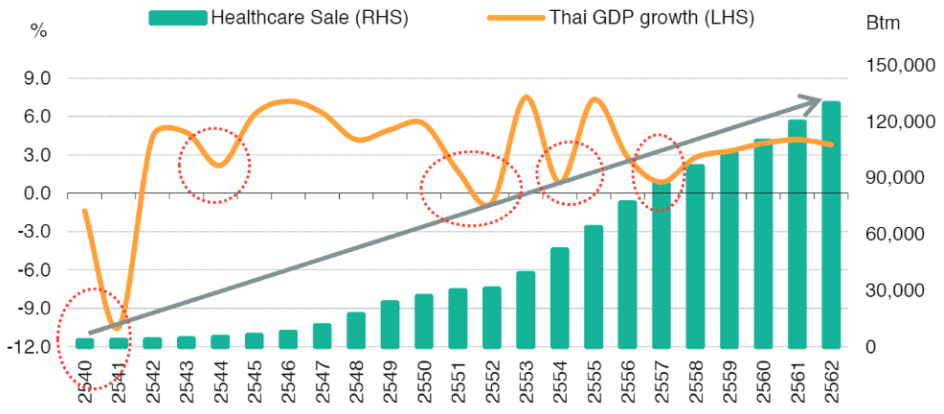


Figure 1: Relational graph between Thai GDP growth and Sales in Healthcare sector between 1997 and 2019
Source: Bank of Thailand and Bualuang research

[1] P/E ratio measures the firm current share price relative to its earnings per share.

Remarks: In figure 1, the x-axis is year on the basis of B.E. (= year in A.D. + 543) in this figure it starts from 1997 to 2019, the left y-axis is percentage of Thai GDP growth, and the right y-axis is value of healthcare sales in the unit of Million Baht

However, in 2020, it was a different story as Thailand experienced a crisis again with GDP growth of -6.2%[2], but this time the healthcare sector also got a negative effect. The studied by Kasikorn research shown a contraction of 12.5 percent of the revenue of private hospitals[3] which indicates that this crisis was worse than previous crises mentioned above.

To be more specific, we examined the consolidated financial statements of the three largest corporations in the Thai healthcare sector by market capitalization in 2020, BDMS, BH, and THG, and discovered the similar pattern of revenue change. In 2020, they all had a revenue decline, which was followed by a revenue recovery in 2021. Although the movement was the same, the magnitude was much different, as shown in figure 2.

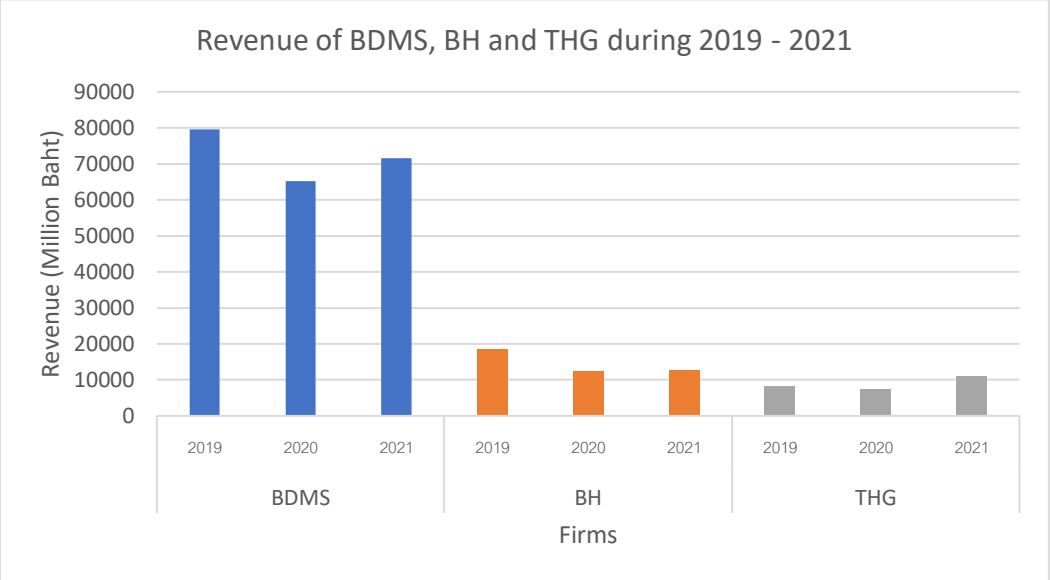


Figure 2: Annual revenue of BDMS, BH and THG between 2019 – 2021
Source: investor relation website of BDMS, BH and THG

[2] NESDC Economic Report (2022, February 21), Thai Economic Performance in Q4 and 2021 and Outlook for 2022, Retrieved from: https://www.nesdc.go.th/ewt_dl_link.php?nid=12313&filename=QGDP_report#:~:text=trade%20volume.,%20in%20the%20previous%20quarter
Remarks: NESDC is the National Economic and Social Development Council of Thailand

[3] Kasikorn research current issue No.3277 (2021, October 8), Private hospitals 2021 likely to see revenue recover from low base though cost management and intense competition continue to affect business, Retrieved from: https://www.kasikornresearch.com/EN/analysis/k-econ/business/Pages/Private-hospital-z3277.aspx

The BDMS faced the biggest decreased in revenue followed by BH, while THG had quite small loss compared with the first two. In addition, BDMS and THG had a significant recovery of their revenue while BH's revenue still did not change much, so even though this crisis was financially severe, the financial loss affected by the pandemic was not equal among these 3 Thai healthcare firms.

Therefore, this study aims to compare the financial performance between BDMS, BH, and THG during 3-years period of COVID pandemic (2019 - 2021) in order to determine the key areas where the most suffering firm can learn from the least suffering firm to improve its financial performance so that they will not experience a dramatic financial loss again in case the crises happened again in the future.

# 2. Background

## 2.1 Private healthcare sector outlook

According to the study by Krungsri research[4], overall, Thailand has 38,512 healthcare services facilities. State-funded facilities such as public health centers, community and general hospital accounted for approximately 35% whereas about 65% are private-funded facilities such as private clinics and hospitals which can be divided as shown in pie charts below.

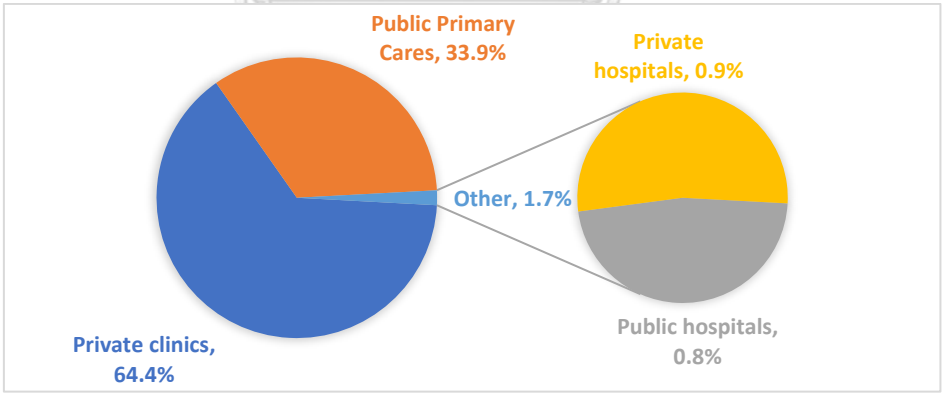


Figure 3: Overview of Thai healthcare facilities
Source: Bureau of policy and strategy, ministry of public health (MOPH) and Krungsri research (observed in April 2016)

[4] Ninkitsaranont Poonsuk.(2020, September, 02). *Krungsri Research.Industry Outlook 2020-2022: Private Hospital*. Retrieved from: https://www.krungsri.com/en/research/industry/industry-outlook/Services/Private-Hospitals/IO/io-Private-Hospitals

Noticed that private hospitals accounted for 0.9%, these percentage is represented by 370 registered private hospitals including 116 hospitals in Bangkok and 254 hospitals upcountry.

To be specific, private hospital can be grouped by the number of registered beds as shown in pie charts below.

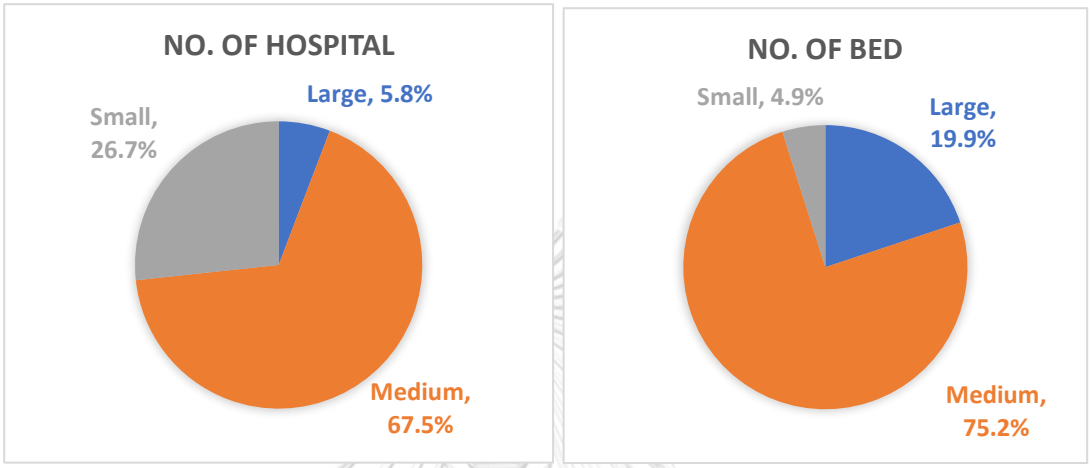


Figure 4: Number of hospitals and beds in Thailand breakdown by size
Source: ministry of public health (MOPH) and Krungsri research

A large hospital is the hospital with more than 249 registered beds. 90% of large hospitals are in Bangkok or the central region of Thailand due to concentration of high-income consumer. a medium hospital is the hospital with the registered beds between 31 - 249 beds. a small hospital is the hospital with the registered beds between 1 - 30 beds.



The source of private hospital's revenue is mainly medicine, doctor fee, laboratory test and x-rays, room fees from inpatient and others which can be divided by percentage as shown in figure 5 (left).

About the customers of private hospitals or the patients, the recent data available, observed in 2016, shows that There was a total of 61.6 million patient visits at Thai private hospitals. 93.1% of that number of patients were Thai citizens and 6.9% were foreign nationals mostly from Myanmar, Japan, the Middle East, and Europe.

Breaking down by patient types of 61.6 million patient visits in total, 95.5% were for outpatient services and 4.5% were for in-patient treatment.

It can also be broken down by the region where patient registered. The result is shown in figure 5 (right).

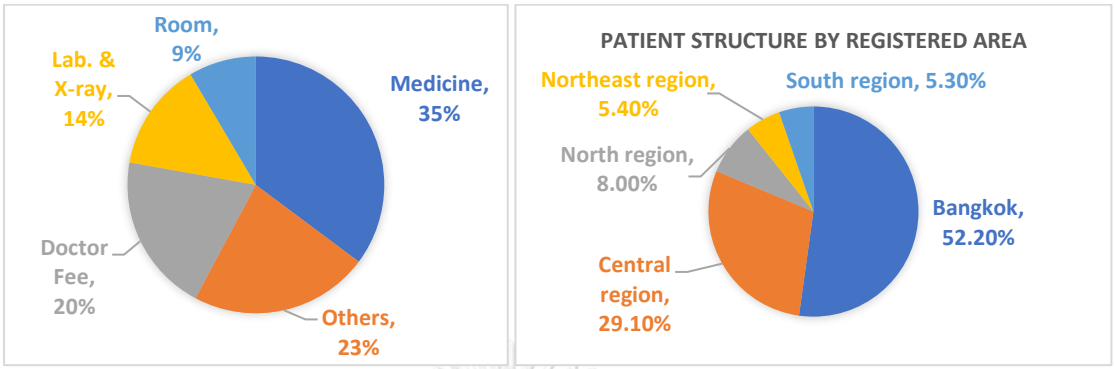


Figure 5: The components of Thai private hospital revenue structure (left) and Thai patients structure break down by registered area (right)
Source: National statistical office (NSO) and Krungsri research (observed in 2011)

## 2.2 Bangkok Dusit Medical Services PCL (BDMS)

Bangkok Dusit Medical Services Public Company Limited has been listing on The Stock Exchange of Thailand under the symbol "BDMS" and is regarded as a healthcare service provider including private hospitals and other healthcare - related businesses in Thailand and abroad. The Company's main line of business is the private hospital business which is operated through the Company and its subsidiaries. Currently, the Bangkok Hospital group consists of 25 hospitals such as Samitivej Group and Phyathai Hospital Group. Apart from the private hospital business, the Company has also invested in many other supporting or related businesses such as Wellness Clinic, medical laboratory, manufacturing of medicine and saline, pharmacy, and medical supply store. BDMS's revenue, gross profit, EBITDA, and net profit during 2016-2021 are shown below.

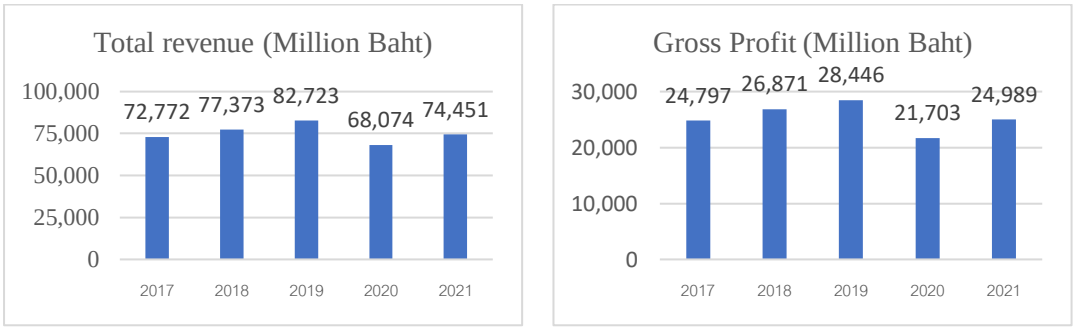


Figure 6: BDMS total revenue (left) and gross profit (right) between 2017 and 2021
Source: BDMS annual report 2021

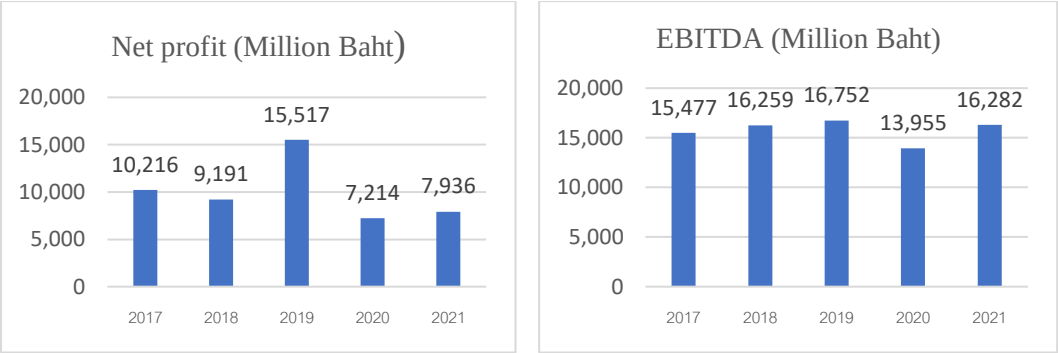


Figure 7: BDMS net profit (left) and EBITDA (right) between 2017 and 2021
Source: BDMS annual report 2021

### 2.3 Bumrungrad Hospital PCL (BH)

Bumrungrad Hospital Public Company Limited has been listing on The Stock Exchange of Thailand under the symbol "BH". The company operates a private hospital business in Bangkok with 580 licensed beds and capacity for over 5,500 outpatients per day. The Company is one of the leading healthcare providers in Thailand and the Southeast Asian region, providing complete healthcare services for both outpatients and inpatients. The Company has always emphasized the importance of quality healthcare and experienced physicians and staff. Bumrungrad International Hospital, Bangkok is the first hospital in Asia to receive the US standard accreditation from the Joint Commission International (JCI). Additionally, the hospital is the first to be approved by Thai Hospital Accreditation (HA) and has received Advanced Healthcare Accreditation (AHA) until now. It is also the first hospital in Thailand to receive accreditations from the College of American Pathologists (CAP). BH's revenue, gross profit, EBITDA and net profit during 2016-2021 shown below.

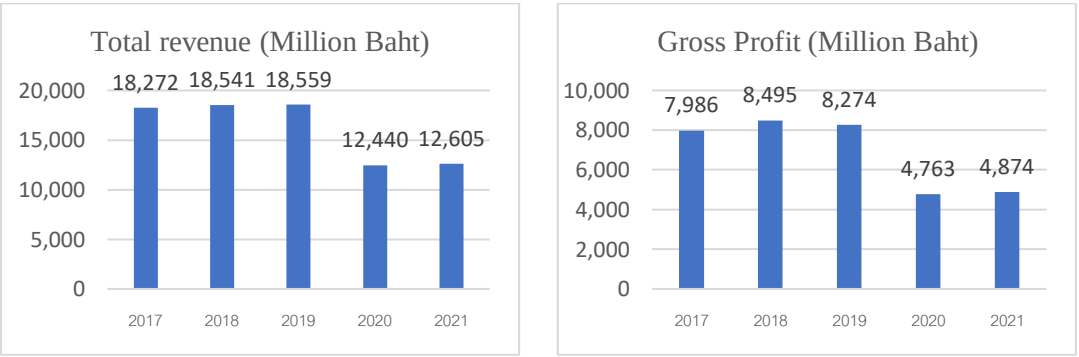


Figure 8: BH total revenue (left) and gross profit (right) between 2017 and 2021
Source: BH annual report 2021

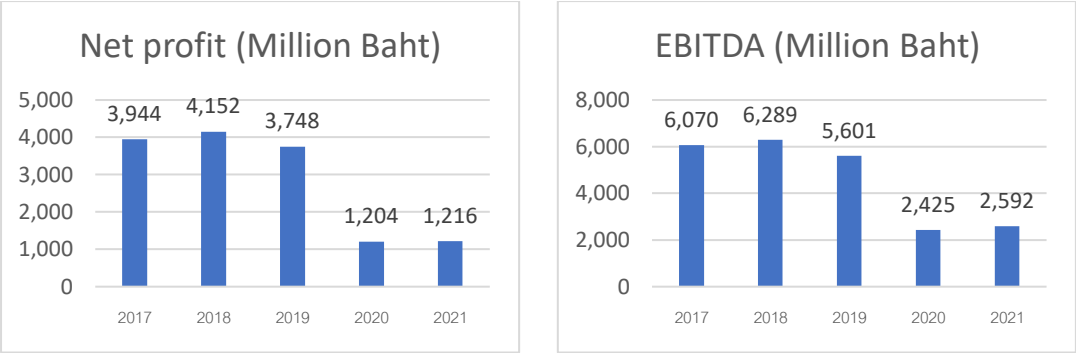


Figure 9: BH net profit (left) and EBITDA (right) between 2017 and 2021
Source: BH annual report 2021

## 2.4 Thonburi Healthcare Group PCL (THG)

Thonburi Healthcare Group has been listing on The Stock Exchange of Thailand under the symbol "THG". The core business of THG is operating hospitals both in Bangkok and upcountry in Thailand. In addition, the company also operates two hospitals abroad. Apart from the private hospital business, the firm also run related business, such as medical center management, healthcare solutions provider and dental equipment, as well as senior living project with comprehensive medical services. THG's revenue, gross profit, EBITDA and net profit during 2016-2021 shown below.

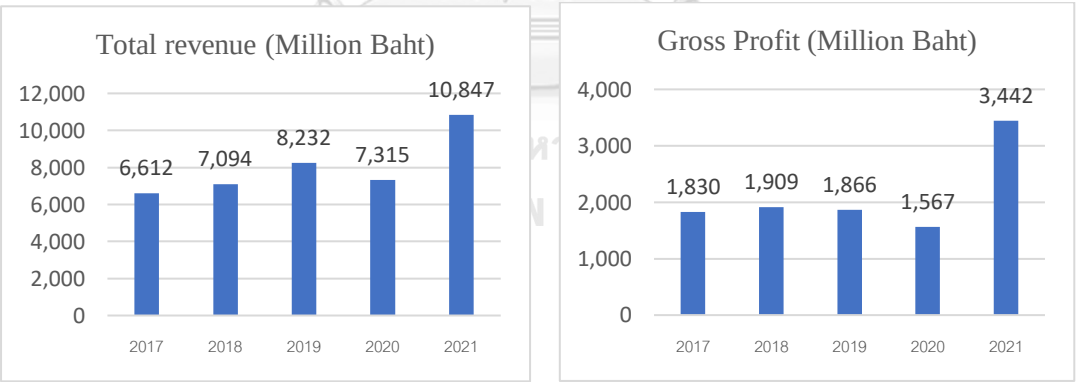


Figure 10: THG total revenue (left) and gross profit (right) between 2017 and 2021
Source: THG annual report 2021

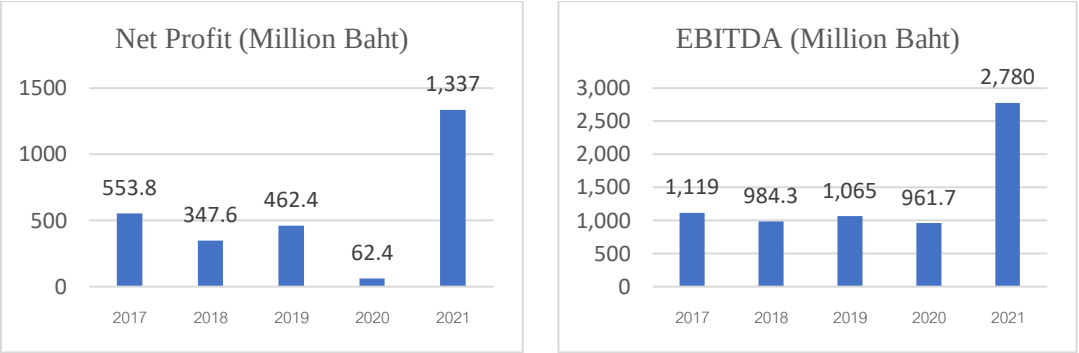


Figure 11: THG net profit (left) and EBITDA (right) between 2017 and 2021
Source: THG annual report 2021

## 2.5 Economic and financial impact of COVID pandemic in Thailand

In December 2019, the first human instances of COVID-19 were discovered in Wuhan, People's Republic of China. Since then, the infection has aggressively spread. There were an increasing number of COVID cases. As a result, on December 31, 2019, WHO was notified of instances of pneumonia with an unknown cause in Wuhan, China. On January 7, 2020, Chinese authorities identified a novel coronavirus as the cause, which was given the temporary designation "2019-nCoV."[5] However, Thailand got no effect at that time as the first confirmed case in Thailand was found on 13 January 2020.[6] Therefore, 2019 is considered to be a year before covid outbreak, but after that the COVID cases in Thailand started to rise and Government responded by applying many restrictions such as Curfew and lockdown according to the timeline below.



[5] World Health Organization (WHO), (2020 January 20), Novel Coronavirus (2019-nCOV) situation report -1, Retrieved from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf
[6] World Health Organization (WHO), (2020 September), Thailand how a strong health system fights a pandemic, Retrieved from: https://www.who.int/docs/default-source/coronaviruse/country-case-studies/thailand-c19-case-study-20-september.pdf?sfvrsn=d5534183_2&download=true

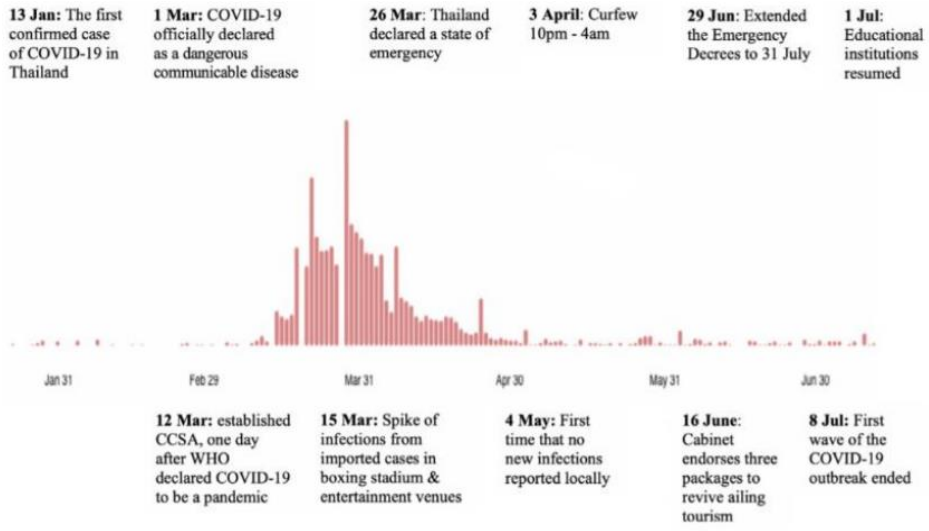


Figure 12: Timeline of COVID situation in Thailand
Source: WHO report, Thailand how a strong health system fights a pandemic (September 2020)

In the same year, we saw many negative effects to the economy and many businesses.

The most obvious one is a drastic shrink in Thai economy in 2020 as NESDC reported that Thai GDP growth rate declined by -6.2%YoY. In that year, the growth rate of the export of goods decreased by -6.5 %YoY while the private investment fell by -8.2%YoY.[7] The economy was so bad that IMF estimated the expected growth rate of Thai economy in 2021 was 1.0% which was the lowest among ASEAN-5.[8] Even though the actual growth rate of Thai economy in 2021 was more than IMF expectation at 1.6%, it was still not a good sign. In addition, the United Nations industrial development organization (UNIDO) reported that from their observations on 307 respondent firms, 90 percent or more of Thailand's manufacturing firms faced extreme loss of revenue. Thai small-size and low-tech firms had been hit the hardest by the crisis. In April 2020, there was a fall of 82%YoY in the manufacturing performance index (MPI) in the automotive sector, registering the lowest production since 1987.[9]



[7] NESDC (2022, February 21), Thai Economic Performance in Q4 and 2021 and Outlook for 2022, Retrieved from: https://www.nesdc.go.th/ewt_dl_link.php?nid=12313&filename=QGDP_report#:~:text=trade%20volume.,%20in%20the%20previous%20quarter
[8] International Monetary Fund (IMF), (2021, October), World Economic outlook: Recovery During a Pandemic page 38
[9] United Nations Industrial Development Organization, Impact assessment of COVID-19 on Thailand's manufacturing firms. Retrieved from: https://www.unido.org/sites/default/files/files/2021-03/UNIDO COVID19 Assessment_Thailand_FINAL.pdf

Healthcare sector also got a negative effect. The studied by Kasikorn research shown a contraction of 12.5 percent of the revenue of private hospitals.[10] As government temporary cancelled certificate of entry (COE) in order to prepare the beds for domestic COVID patients, so the foreign patients could not come in. As a result, the revenue that private hospitals got from medical tourism, which generated more than 140,000 million Baht of revenue per year for Thai hospitals in 2018 and 2019, decreased.[11] A drop in hospital revenue led to a decrease in doctors, nurses, and healthcare workers OT. Some hospitals reduced the numbers of employees. Private hospitals executives expected that in Q4/21, there will be more medical tourists as the COVID situation is better. This will led to a better financial position for private hospitals.[12] However, Prof. Dr. Chalerm Harnphanich, CEO of Bangkok chain hospital, mentioned that "although the medical tourists will come back after COVID, it may not be the same as before COVID and it may decrease because during 2 years of COVID pandemic foreign patients who need a treatment urgently have already admitted to the hospitals in their home countries. Therefore, Thai medical tourism will take some time to recovery while the rivals in this market such as Singaporean hospitals recover faster due to their efficient COVID pandemic management"[13]

## 3. Literature review

The observed negative effect from COVID-19 on hospital's financial performance occurred not only in Thailand but also in many countries as there were several studies on this issue.

In the U.S., the financial performance of the many American hospitals was not healthy since before the COVID pandemic. In 2018, the median of US hospitals operating margin (defined as the measures of how much profit a company makes on a dollar of sales after paying for the cost of production) was 2%. On the median, US hospitals had liabilities approximately twice as much as their assets which implies that a hospital need more asset to cover its debt. In terms of liquidity, the median of US hospitals had 53.4 days cash on hands which means a hospital can continue to pay its operating expenses for 53.4 days. Moreover, some hospitals

[10] Kasikorn research current issue No.3277 (2021, October 8), Private hospitals 2021 likely to see revenue recover from low base though cost management and intense competition continue to affect business, Retrieved from: https://www.kasikornresearch.com/EN/analysis/k-econ/business/Pages/Private-hospital-z3277.aspx
[11] Kriddikorn Padermkurkulpong,Workpointtoday, (2020, September, 18), The future of the hospital business when a foreign patient disappeared and Thailand has become an aging society, Retrieved from: https://workpointtoday.com/hospital-business-after-covid/
[12] ThaiPBS, (2020, July 12), COVID-19 has resulted in a reduction in revenue for private hospitals., Retrieved from: https://news.thaipbs.or.th/content/294499
[13] Thairath, (2021 August 16), COVID affected medical tourism and private hospitals business: International patients disappeared and expected to recover in 5 years

had a worse position. For example, some hospitals in the 25th percentile had -4.4% operating margin and 7.6 days cash on hand. (Khullar, Bond, and Schperp, 2020)

For this reason, when the outbreak of COVID started in 2019 the situation got worse. COVID pandemic put the extreme financial pressure on the US healthcare system. Almost all elective procedures and outpatient visits have to be cancelled. Their revenue was drained as many high margin services such as orthopedic and cardiac procedures were cancelled while many surgical expenses are fixed. For example, the operating room and equipment. (Barnett, Mehrota and Landon, 2020) As a result, it was not financially beneficial for US hospital, although there are many new patients associated with COVID pandemic because the cost outweighed the benefit. The figure below shows the estimated financial loss of Washington State hospital. (Carroll and Smith ,2020)

| Department | Reduction in volume | Revenue lost | Supply cost avoided | Net financial impact |
|---|---|---|---|---|
| Surgery | 25% | (15,500,636) | 3,038,828 | (12,461,807) |
| | 37% | (22,940,941) | 4,497,466 | (18,443,475) |
| | 50% | (31,001,271) | 6,077,656 | (24,923,615) |
| Clinics | 10% | (798,011) | 154,167 | (643,844) |
| | 15% | (1,197,017) | 231,251 | (965,766) |
| | 20% | (1,596,023) | 308,335 | (1,287,688) |

Figure 13: Estimated financial losses associated with a 3-month reduction in clinical and surgical volume of Washington state hospital during COVID pandemic
Source: Data from a Washington State Hospital, Financial Implications of the COVID-19 Epidemic for Hospitals: A Case Study (Carroll and Smith ,2020)

This study by Carroll and Smith also pointed out 3 main reasons why US hospitals incur loss. First, as both clinical and surgical treatment volumes dramatically declined, many hospitals experienced the tremendous loss of revenue. Second, the cost of supplies rose. And third, there was a shift of patient volume from acute care, which is the type of short-term medical care for serious injuries or illnesses such as bone fractures, burns or some surgical procedure, to intensive care service, which is the type of care that requires life-saving actions and close monitoring of patients. This change does not tend to be beneficial.

Not only for hospitals, the financial performance of the academic medical centers (AMCs) was unhealthy and risky as their cost structure are high. (Colenda, et al, 2020)

Apart from the US, there are several studies in ASEAN region which indicate the same thing. The Indonesian hospitals' revenue also decreased as "The COVID-19 Pandemic has a negative impact income generation of hospitals, OPD and diagnostic services operating at 20%, while inpatient services have been affected by government notifications to delay non-essential and elective operations and only 15% on" (Mahubessy and Darmawan 2022, 2245)

The financial performance of Bayu Asih hospital Purwakarta, one of Indonesian hospitals, was analyzed by applying ratio analysis to compare its performance before and during the COVID pandemic. The study found some facts below.

1. The length of treatment was shortened as there were more cases with minor sickness.
2. Some available beds were transferred for COVID patients which is the less effective bed management. However, it still within the normal limits.
3. Between 2019 and 2020, the use of bed was not fully utilized as less people visited hospital due to restrictions.
4. Between 2019 and 2020, it will take more than 1 day on average to wait for each bed to be occupied.

In terms of financial and service performance, the Bayu Asih Hospital had an improved performance in 2019 before the pandemic. However, after the pandemic started, financial and service performance of the Bayu Asih Hospital decreased, due to restrictions on patient services. In particular, the outpatient clinics. The less effective use of available beds also had an impact on hospital revenues. (Yuniarti, Paryanti, and Tejaningsih, 2020)



We can see from most studies that the financial ratio analysis was applied because this technique was proved to be useful that they can indicate a firm's business performance well and sometimes they are also used for predicting future performance as well. (Barnes, 1987) Even though there is no officially agreement on the universal formulas or calculation methods or number of financial ratios to be used (Delen, Kuzey, and Uyar 2013), the ratios that commonly used can be divided by what they measure into 4 main groups including liquidity, profitability, debt and activity (efficiency) (Gitman, McDaniel, and Shah 2018)

Another thing, that most studies show, is that the source of the hospital loss in profit during COVID pandemic is related with the cost and revenue structure which is associated with their business model. Their performance before COVID pandemic, which is reflected in their

financial statement, is also relevant which means different business models and different operating performance leads to different outcome and different financial resilience.

According to Kruse, and Jeurissen (2020), The result of studying three organizational factors in the business model that determine how much hospitals, which are in the developed countries such as the US, the UK ,and Australia, will be affected by pandemic shock show that the most influential factor is care portfolio (whether the hospital focus on outpatients or just have mixed portfolio) followed by the size by market capitalization of the hospital and the type of ownership (whether it is private equity owned or Publicly-Quoted and Owner-Managed Hospitals) respectively. The study also shows the Schematic Outline Financial Resilience of for-Profit Hospitals

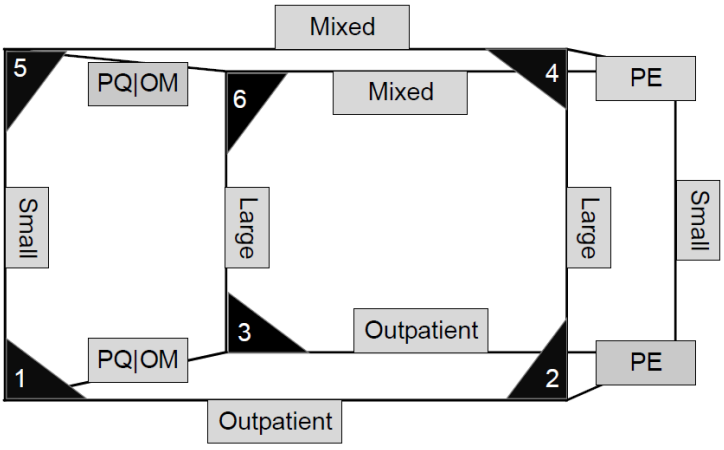


Figure 14: The Schematic Outline Financial Resilience of for-Profit Hospitals diagram
Source: For-profit hospitals out of business? Financial sustainability during the COVID-19 epidemic emergency response. Kruse, F. M., & Jeurissen, P. P. (2020)
Remarks: PE = private equity; PQ/|OM = publicly quoted or owner-managed

Each corner represents the combination of three financial resilience determinant factors mentioned above. The corners include scores. One indicates the most vulnerable organizational form and six indicates the least vulnerable which means the small-scale OM hospitals that focus strongly on outpatient treatments are the most vulnerable types of hospitals during pandemic. However, the study was conducted with only hospitals in the developed countries and provides no clear information for the hospitals in the developing countries such as Thailand whether the same result will appear or not.

Therefore, this study will focus on the financial ratio analysis of three Thai hospitals during COVID pandemic and provides discussion in depth regarding their different business models

including care portfolio, cost management and debt structure in order to compare which type of hospital business model has the most financial resilience and the best financial performance during COVID pandemic and also which is the most vulnerable one, so that the most affected one can adjust their business model to be more financially strong.

## 4. **Conceptual framework**

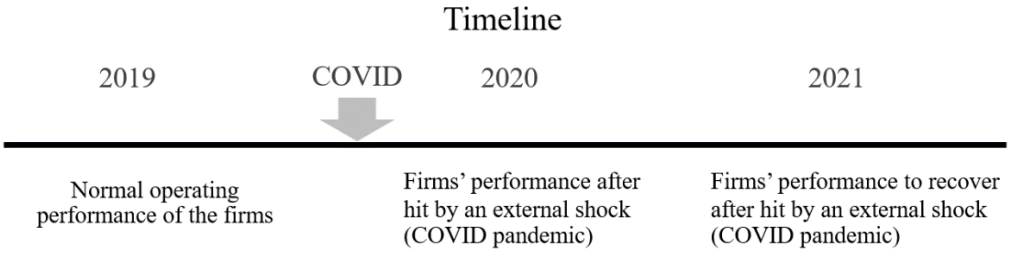


Figure 15: The tentative timeline of COVID situation in Thailand in firms' perspective

The timeline above illustrated the characteristics of Thai firms' performance during 2019 - 2021 as a result from the effect of COVID pandemic. As mentioned in an introduction part, the COVID started to influence many businesses in 2020 and the effect is lower in 2021. Therefore, the performance of a firm can be tentatively divided by year into 3 phases. First, in 2019, the observed performance of a firm showed its normal operating performance before getting the negative effect from COVID. Second, the firm's performance in 2020 showed how much effect they got from COVID pandemic. Finally, the firm's performance in 2021 showed the firm's ability to recover after getting hit by COVID pandemic.



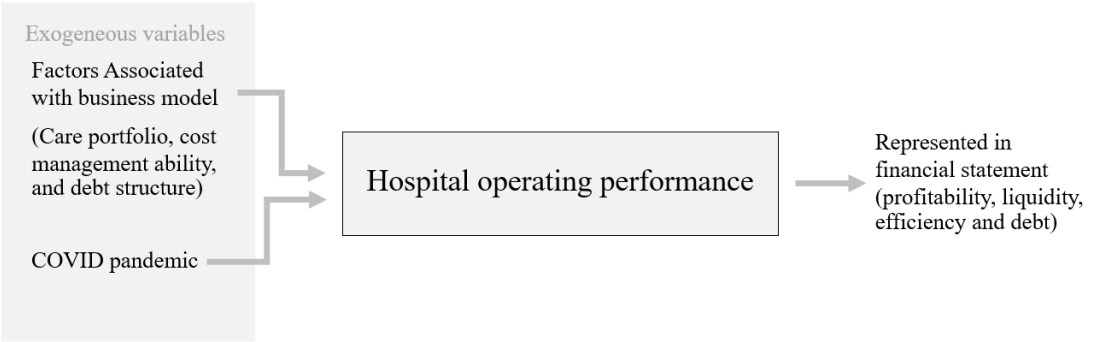


Figure 16: The conceptual framework diagram

The conceptual framework relates to hospital operating performance shown above is associated with the above timeline. To be specific, the firm's operating performance mentioned in the timeline is the hospital operating performance that reflected by its financial position extracted from its accounting statement by applying financial ratio analysis.

As government imposed several restrictions such as curfew and lockdown to alleviate the pandemic situation, the demand and supply in hospital business, which are considered as endogenous variables that directly affect hospital operating performance, have been disturbed. As a result, hospitals, which are the business in healthcare sector, experienced the financial loss as well as other firms in other sectors. However, all hospitals did not experience the same size of loss because they have different business model. The hospital with an efficient business model would sustain less harm and recover sooner whereas ones with an inefficient business model would encounter financial difficulties. Therefore, we can consider the COVID pandemic and the hospital business model as exogenous variables that influence the hospital operating performance.

# 5. **Research Scope, Data and Methodology**

This research compares the financial performance of BDMS, BH, and THG from Q3/2019 to Q1/2022 based on secondary data sources such as company financial statements, NESDC reports, business records of each firm, journals, newspapers, and websites. Financial data of the three companies was obtained from Stock Exchange Thailand (SET), investors relation website of each firm and Jitta.com.

The study applied ratio analysis to determine the key differences between the three companies. Ratio analysis was used because it is a valuable method for understanding a company's status, including its strengths and weaknesses, by dividing distinct financial statistics by one another. Furthermore, ratios are useful because they normalize balance sheet and income statement information, allowing for analysis to be conducted regardless of firm size. (Melicher & Norton, 2017). The financial statements of BDMS, BH, and THG are examined using ratios in the categories of liquidity, efficiency, profitability, and leverage. The current ratio and cash ratio are used to measure liquidity. Cash conversion cycle and asset turnover are used to measure efficiency. ROA and ROE are used to determine profitability. Last but not least, leverage ratios are Time Interest Earned (TIE) and Debt Ratio. Each ratio's explanation is given below.

## 5.1 Key financial ratios

### 5.1.1 Liquidity ratios

The current ratio evaluates a company's capacity to pay back short-term debts when they become due by comparing current assets and current liabilities. Therefore, the current ratio formula is shown as follows:

$$Current\ ratio = \frac{Current\ Asset}{Current\ liabilities}$$

The cash ratio is a measurement for determining a firm's liquidity. It analyzes the amount of total cash and cash equivalents of a company compared to its current liabilities. The indicator estimates a company's ability to repay short-term debt using cash or near-cash resources such easily marketable securities. The formula is shown as follows:

$$Cash\ ratio = \frac{Cash\ or\ equivalents}{Current\ liabilities}$$

### 5.1.2 Efficiency ratios

The asset turnover ratio measured the efficiency with which a corporation uses its total assets to produce revenue. In other words, it illustrates how much revenue a firm can generate from its assets. This ratio is calculated by the following formula:

$$Asset\ turnover\ ratio = \frac{Revenue}{Asset}$$

The Cash Cycle indicates how long it takes for a corporation to get money back (from selling products or services to customers) after paying suppliers, according to the figure below.

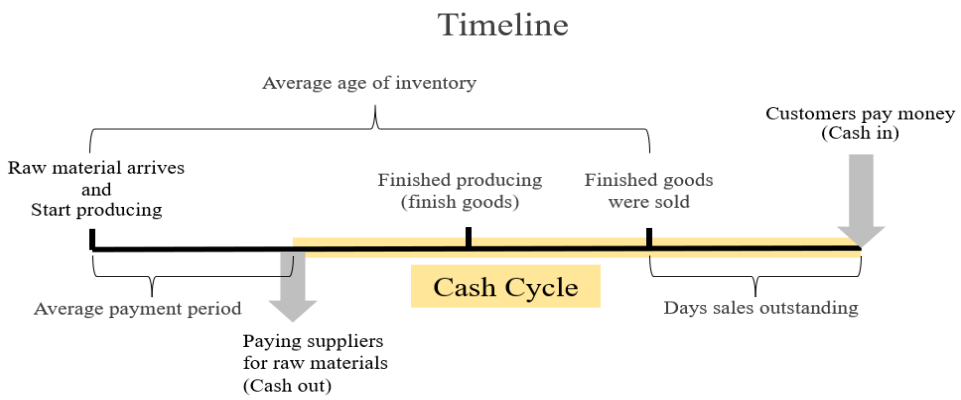


Figure 17: The illustrated diagram of the Cash cycle

$$Cash\ cycle = Days\ sales\ outstanding + Average\ age\ of\ inventory - Average\ payment\ period$$

The ratio takes Day sales outstanding, Average age of inventory and average payment period into consideration, which the explanation shows below.

Days sales outstanding (DSO) measures the average number of days it takes a corporation to receive payment for a sale. We use the formula which shown next page to find it.

$$Days\ sales\ outstanding = \frac{Account\ receivable}{Revenue\ per\ day}$$

The average age of inventory refers to how long it takes a company to sell out its inventory. It is a number those analysts use to figure out how efficient sales are. Days' sales in inventory are another term for the average age of inventory (DSI). We use the formula below to find it.

$$Average\ age\ of\ inventory\ = \frac{Inventory}{Cost\ of\ goods\ sold\ per\ day}$$

The average payment period refers to how long it takes an organization to pay off its debts for goods purchased on credit from the company's suppliers. We use the formula below to find it.

$$Average\ payment\ period\ = \frac{Account\ payable}{Cost\ of\ goods\ sold\ per\ day}$$

5.1.3 Profitability ratios

Net profit or net income or net earnings of a firm indicates a company's profit after all of its expenses have been deducted from revenues. It is often referred to as the “Bottom line” and is calculated as followed.

$$Net\ profit = EBIT(1 - Tax\ rate) - Paid\ interest$$

Where EBIT (earnings before interest and taxes) is a company's net income before income tax expense and interest expenses are deducted.

$$EBIT = Revenue - Cost\ of\ goods\ sold - \text{selling, general and administrative expenses}$$

The return on equity (ROE) is a financial performance indicator that is computed by dividing net income by shareholders' equity. Because shareholders' equity equals a company's assets minus its debt, the return on net assets is referred to as ROE. In conclusion, the return on equity (ROE) is a measure of a company's profitability and efficiency in generating profits.

$$ROE = \frac{Net\ profit}{Equity}$$

The return on assets (ROA) measures how profitable a company is in comparison to its total assets. ROA is a metric that measure how well a company uses its assets to generate profit. The metric is often stated as a percentage. A higher return on investment (ROI) implies that a corporation is more effective and productive in managing its balance sheet to generate profits, whilst a lower ROA suggests that there is still space for improvement.

$$ROA = \frac{Net\ profit}{Asset}$$

5.1.4 Leverage ratios

The debt ratio measures a company's financial leverage (indebtedness) by demonstrating how much of its assets are financed by debt. Because we are focusing on financial leverage rather than future spending, we will only look at financial debt (debt with interest) in this interpretation. Therefore, the formula is shown as follows:

$$Debt\ ratio\ = \frac{Interest\ bearing\ debt}{Total\ asset}$$

The TIE ratio is a measure of a company's capacity to meet debt obligations based on current income. Earnings before interest and taxes (EBIT) divided by total interest payable on bonds and other debt is the formula for calculating a company's TIE number. The outcome is a number that indicates how many times a company's pretax earnings could pay its interest charges. The interest coverage ratio is also known as the TIE.

$$Time - interst - earned\ (TIE)\ ratio\ = \frac{EBIT}{Interest\ expenses}$$

Following the financial ratio analysis, the research uncovers the underlying reasons behind those financial ratios by the analysis of operational statistics, which are used to create an overview of the operating impact and identify possible areas in which the most affected organization can improve to be in a stronger financial position. As such, to discovers the underlying reasons for the financial metrics, we analyzed the operational statistics, and this will be relevant to some more technical terms whose explanation are shown below.



## 5.2 Operating statistics variables

ADC

Average Daily Census (ADC) is the average number of inpatients during the year. It can be used to converted to other indicators. For examples, The ADC multiplied by 365 gives the total number of patient days per year. The ADC divided by the bed capacity and multiplied by 100 gives the Bed occupancy rate.

Utilization rate or Bed occupancy rate

Bed occupancy rate (BOR) is a measure of utilization of the available bed capacity in the hospital, and it indicates the percentage of beds occupied by patients in a given period, usually 1 year. It reflects efficiency in the use of hospital beds.

IPD / OPD

IPD stands for inpatient department while OPD full form is outpatient department.

### 5.3 Projected revenue and profitability method

After analyzing financial ratios and operational statistics, this study additionally forecasted BDMS, BH, and THG's revenue, ROA, and ROE over the following few years in order to examine how the financial ratios with significant differences between the three organizations would change over time. Some variables we refer to the forecast by Kasikorn research[14] as it would take a lot of time to predict those variables and require a deep understanding in healthcare industry which is beyond the scope of this study.

In order to forecast ROA and ROE, we need to forecast net profit, total assets, and total equity of each firm. Therefore, we must forecast EBIT, paid interest, and tax expense rate in order to forecast net profit due to the formula in 5.1.3. Then, to forecast EBIT, we must forecast sales, cost of goods sold, as well as selling general and administrative expenses. Ultimately, all relevant variables, which we have to predict for projecting, and the prediction method for each variable are summed in table 1 and virtually illustrated as shown in figure 18.

| Variables | Forecast calculation method |
|---|---|
| Revenue | calculated based on each firm revenue structure and some variables would be relied on Kasikorn research forecast |
| Cost of goods sold | Finding the average of the past 5 years before COVID (2015-2019) because these variables did not change much over the period |
| Selling, general and administrative expenses | |
| Tax expense rate | |
| Paid interest | refer to Kasikorn research forecast |
| Total assets | |
| Total Equity | |

Table 1: All relevant variables require for forecasting profitability of each firm and the prediction method for each variable

[14] KS research strategy company analysis (searching for BDMS, BH and THG). Retrieved from: https://www.kasikornsecurities.com/th/research/company-analysis/

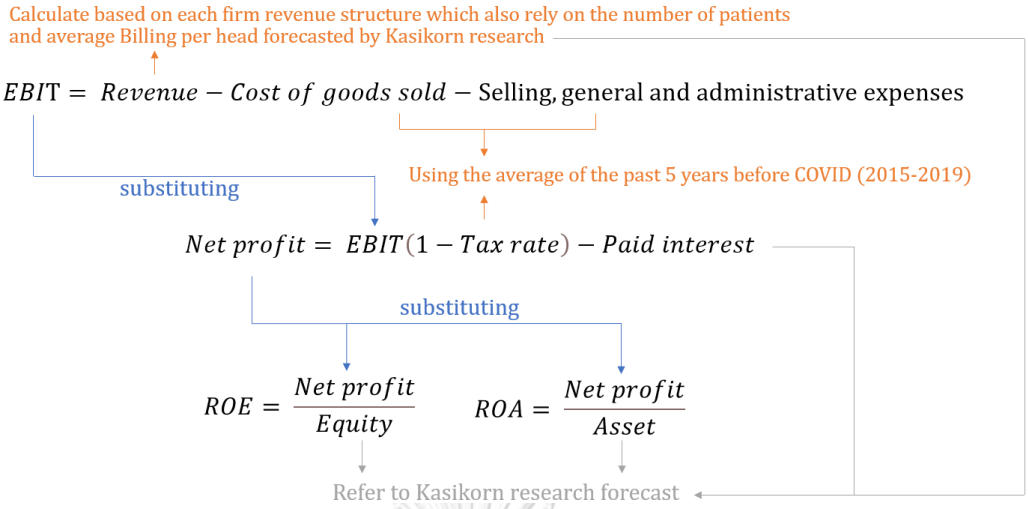


Figure 18: The calculation method for projecting the ROA and ROE for 2022-2024

Remarks: As the forecast is done based on different revenue structures for each firm so it would be very difficult to provide all prediction details of each firm in this section. More thorough calculation details for each variable would be provided in section 8.

### 5.4 Annotation

In this study, we employed some annotations, so we have concluded it in this part to ensure your understanding.

COVID

COVID stands for Coronavirus disease of 2019

BDMS / BH / THG

BDMS stands for Bangkok Dusit Medical Services Public Company Limited.
BH stands for Bumrungrad Hospital Public Company Limited
THG stands for Thonburi Healthcare Group Public Company Limited

SG&A expenses

SG&A expenses stands for selling, general and administrative expenses

Qx/yyyy means The Quarter x of year yyyy
For instances, Q2/2020 means the second quarter of 2020 or Q4/2019 means the fourth quarter of 2019

FYyyyy means full year of yyyy

For instances, FY2019 refers to Full year 2019

# 6. **Accounting performance analysis**

| Time period | 2019-Q3 | 2019-Q4 | 2020-Q1 | 2020-Q2 | 2020-Q3 | 2020-Q4 | 2021-Q1 | 2021-Q2 | 2021-Q3 | 2021-Q4 | 2022-Q1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Bangkok Dusit Medical Services PCL (BDMS)** | | | | | | | | | | | |
| Total revenue | 21625 | 21139 | 19740 | 13787 | 16719 | 17828 | 16027 | 17163 | 19664 | 21596 | 22986 |
| Net income | 2890 | 2323 | 2568 | 457.8 | 1801 | 2388 | 1339 | 1452 | 2509 | 2636 | 3443 |
| Liquidity : | | | | | | | | | | | |
| Current ratio | 0.81 | 0.85 | 0.81 | 1.05 | 0.97 | 2.67 | 2.37 | 1.53 | 1.27 | 1.54 | 1.44 |
| Cash ratio | 0.31 | 0.24 | 0.40 | 0.27 | 0.29 | 1.75 | 1.67 | 0.78 | 0.59 | 0.69 | 0.60 |
| Efficiency ratio : | | | | | | | | | | | |
| Asset turnover | 0.16 | 0.16 | 0.14 | 0.10 | 0.13 | 0.13 | 0.12 | 0.14 | 0.15 | 0.17 | 0.18 |
| Cash Cycle | 22.71 | 24.05 | 25.05 | 38.44 | 25.99 | 24.94 | 23.40 | 23.03 | 28.12 | 25.22 | 21.31 |
| Leverage ratio : | | | | | | | | | | | |
| Debt ratio | 0.21 | 0.18 | 0.24 | 0.23 | 0.22 | 0.18 | 0.18 | 0.15 | 0.15 | 0.15 | 0.12 |
| Time-interest-earned ratio (TIE) | 17.26 | 15.51 | 12.06 | 4.53 | 9.77 | 13.64 | 8.28 | 16.87 | 16.98 | 36.31 | 24.50 |
| Profitability : | | | | | | | | | | | |
| ROA | 11.30% | 11.60% | 6.90% | 6.20% | 5.40% | 5.30% | 4.30% | 5.40% | 5.90% | 6.00% | 7.50% |
| ROE | 19.40% | 20.10% | 12.10% | 10.40% | 8.70% | 8.40% | 7.00% | 8.60% | 9.40% | 9.20% | 11.40% |
| | | | | | | | | | | | |
| **Bumrungrad Hospital PCL (BH)** | | | | | | | | | | | |
| Total revenue | 4801 | 4676 | 4128 | 2452 | 2913 | 2947 | 2679 | 3015 | 2989 | 3922 | 4164 |
| Net income | 1055 | 885.9 | 765.2 | 44.4 | 221.5 | 173 | 91.1 | 216.5 | 296 | 612.1 | 725 |
| Liquidity : | | | | | | | | | | | |
| Current ratio | 3.94 | 4.45 | 4.73 | 5.41 | 5.28 | 2.44 | 2.52 | 2.21 | 2.10 | 3.53 | 3.58 |
| Cash ratio | 0.83 | 0.79 | 0.53 | 0.86 | 0.92 | 0.28 | 0.35 | 0.32 | 0.44 | 0.79 | 0.71 |
| Efficiency ratio : | | | | | | | | | | | |
| Asset turnover | 0.19 | 0.18 | 0.15 | 0.10 | 0.12 | 0.12 | 0.11 | 0.13 | 0.13 | 0.19 | 0.19 |
| Cash Cycle | 28.79 | 39.11 | 52.39 | 94.46 | 56.97 | 56.10 | 40.38 | 37.31 | 21.86 | 19.15 | 16.07 |
| Leverage ratio : | | | | | | | | | | | |
| Debt ratio | 0.11 | 0.10 | 0.10 | 0.10 | 0.11 | 0.11 | 0.11 | 0.11 | 0.12 | 0.00 | 0.00 |
| Time-interest-earned ratio (TIE) | | 15.24 | | 0.25 | | 3.36 | | 4.44 | | 13.19 | 59.53 |
| Profitability : | | | | | | | | | | | |
| ROA | 15.40% | 14.70% | 12.90% | 11.00% | BH | 4.80% | 2.10% | 2.90% | 3.30% | 5.40% | 8.00% |
| ROE | 21.00% | 19.50% | 17.00% | 14.50% | 10.20% | 6.30% | 2.70% | 3.90% | 4.40% | 6.80% | 10.10% |
| | | | | | | | | | | | |
| **Thonburi Healthcare Group PCL (THG)** | | | | | | | | | | | |
| Total revenue | 2,235 | 2,117 | 1,940 | 1,580 | 1,913 | 1,882 | 1,566 | 1,906 | 3,861 | 3,514 | 3,530 |
| Net income | 148 | 82.4 | 82.5 | -126 | 75.2 | 30.7 | -215 | 84.2 | 833.1 | 635.1 | 526.8 |
| Liquidity : | | | | | | | | | | | |
| Current ratio | 0.79 | 0.98 | 1.19 | 1.11 | 1.06 | 0.97 | 0.92 | 0.84 | 0.85 | 0.80 | 0.85 |
| Cash ratio | 0.12 | 0.13 | 0.16 | 0.25 | 0.23 | 0.10 | 0.18 | 0.15 | 0.13 | 0.17 | 0.16 |
| Efficiency ratio : | | | | | | | | | | | |
| Asset turnover | 0.11 | 0.10 | 0.09 | 0.08 | 0.09 | 0.09 | 0.08 | 0.09 | 0.16 | 0.15 | 0.15 |
| Cash Cycle | 171.26 | 178.89 | 204.56 | 243.18 | 212.05 | 172.80 | 215.60 | 211.12 | 142.84 | 130.82 | 131.00 |
| Leverage ratio : | | | | | | | | | | | |
| Debt ratio | 0.43 | 0.44 | 0.49 | 0.52 | 0.51 | 0.49 | 0.50 | 0.51 | 0.44 | 0.43 | 0.43 |
| Time-interest-earned ratio (TIE) | 4.47 | 2.40 | 0.26 | -1.08 | 1.52 | 1.57 | -1.83 | 2.04 | 12.70 | 11.24 | 9.85 |
| Profitability : | | | | | | | | | | | |
| ROA | 2.20% | 2.40% | 2.70% | 0.90% | 0.60% | 0.30% | -1.10% | -0.10% | 3.30% | 6.10% | 9.60% |
| ROE | 4.80% | 5.60% | 6.50% | 2.40% | 1.40% | 0.80% | -3.00% | -0.30% | 9.00% | 15.70% | 24.20% |



Table 2: The financial performance of BDMS, BH and THG in the aspects of liquidity, efficiency, leverage, and profitability from Q3/2019 to Q1/2022

The table above shows the comparison between 3 different hospitals' accounting statement and financial ratios across time to compare their financial positions from Q3/2019 to Q1/2022.

## 6.1 Revenue and net profit

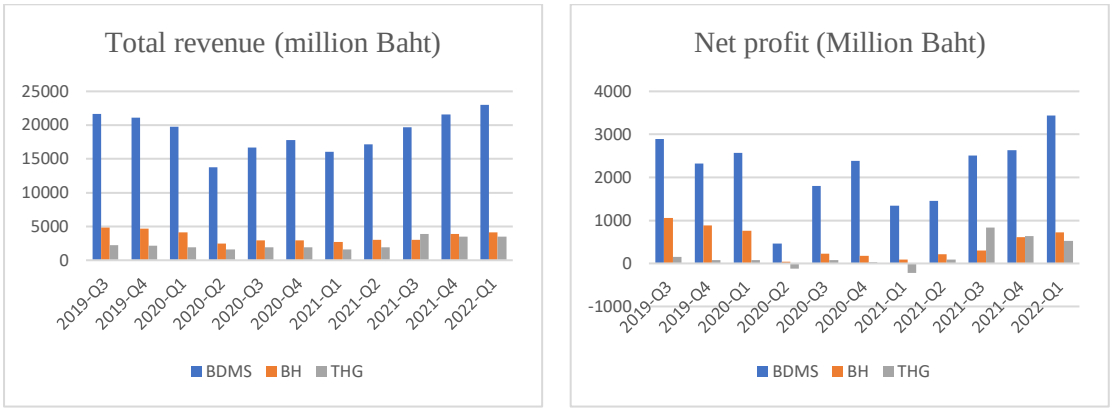


Figure 19: Total revenue of BDMS, BH and THG (left) and Net profit of BDMS, BH and THG (right) from Q3/2019 to Q1/2022

As shown in the figure 19, the revenue and net income of all three hospitals shows almost the same trend but different in magnitude. For the ease of comparison, we rescale it on the basis of the Q3/2019 by dividing other quarters figure by the Q3/2019 figure. As a result, we get figure 20.

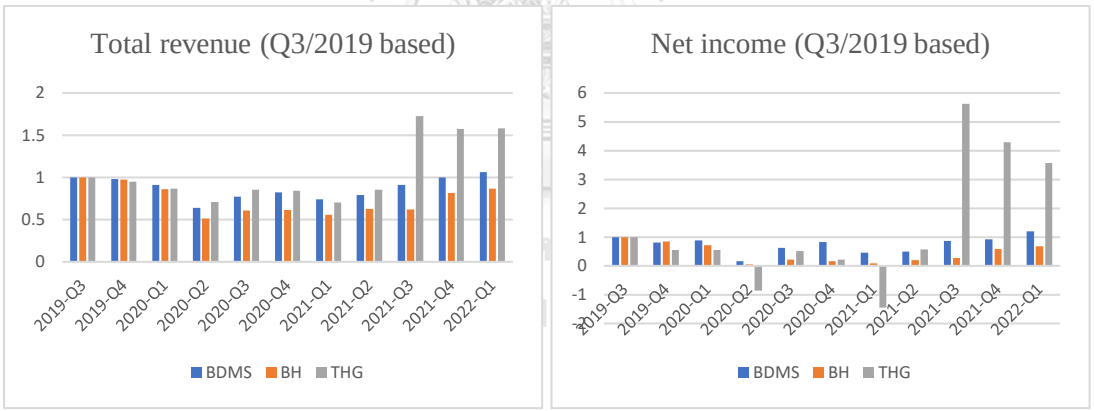


Figure 20: Total revenue of BDMS, BH and THG (left) and Net profit of BDMS, BH and THG (right) from Q3/2019 to Q1/2022 offset on Q3/2019

We can observe from these two graphs that sales and net earnings for all three companies have been declining since Q3/2019, reaching a minimum in Q2/2020. BDMS lost roughly 36.25 percent of its sales and 84.16 percent of its net profit from Q3/2019 during this time. Meanwhile, BH lost 48.93 percent of its sales and 95.79 percent of its net profit, while THG appears to have suffered the most from the negative consequences, losing only 29.30 percent of revenue but losing -126 million Baht in net profit. Following that, revenue increased the following quarter before dropping steadily until it hit its lowest point in Q1/2021.

BDMS and BH's revenue fell less in Q1/2021 than in Q2/2020, but THG's revenue fell about the same as in Q2/2020. Furthermore, THG lost -215 million Baht in net profit, which was higher than the loss in Q2/2020. THG's revenue, on the other hand, jumped substantially and peaked in Q3/2021 with 833.1 million Baht in sales, before progressively declining since then, while BDMS' revenue and net profit recovered and surpassed their Q3/2019 sales and net profit in Q1/2022.

In the meantime, BH sales and net profit recovered steadily as well, but at a slower pace than the other two, since Q1/2022, BH sales and net profit were still below the levels seen in the starting period of the figure.

## 6.2 Liquidity

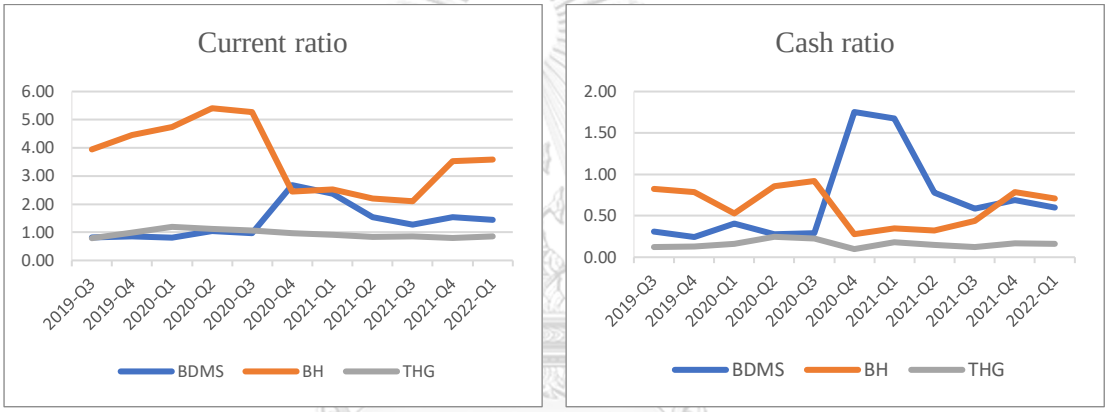


Figure 21: Current ratio of BDMS, BH and THG (left) and cash ratio of BDMS, BH and THG (right) from Q3/2019 to Q1/2022



Concentrating on the liquidity of Three hospitals, BH had more proportion of liquid assets than the others almost all the time, although this proportion dropped approximately by 50% between Q3 and Q4/ 2020. As we can observed from the current ratio, BH had current assets about 4-5 times as much as its current liability since Q3/2019 and dropped to about 2-3.5 times as much as its current liability after Q3 of the later year. Basically, it means that BH has the strongest liquidity position among these three firms. In the short term, BH may keep running the firm without fear of insolvency. In the worst-case scenario, BH can still afford its short-term liabilities by selling current assets and still have the assets to run the business, whereas the other two firms may not have any money left after paying off all of their short-term liabilities, as the current ratios of THG and BDMS were nearly equal to 1, indicating that the amount of current assets and current liabilities of BDMS and THG were nearly equal between the Q3/2019 and the Q3/2020.

To be more precise, BDMS had more liquidity after Q3/2020 because they sold a large number of BH stocks in that year and received a large amount of cash in return, as evidenced by the fact that the cash ratio is much higher in Q4/2020, resulting in BDMS having a stronger liquidity position than BH in that quarter. However, BDMS' liquidity assets declined again after that, but it was still in a better situation than THG. THG, which had the most stable liquidity situation during the time, had a low current ratio of about 1, which fell to slightly less than 1 after 2020. This is not a good sign since it suggests that if the company has no cash inflow, it will be unable to pay back its current liabilities, which are the items that the company has already used and must pay, with its current assets, potentially leading to insolvency. However, given the quantity of current assets and current liabilities were so close together, and we had already seen a modest increase in current assets in Q1/2022, it was not a major issue.

### 6.3 Efficiency

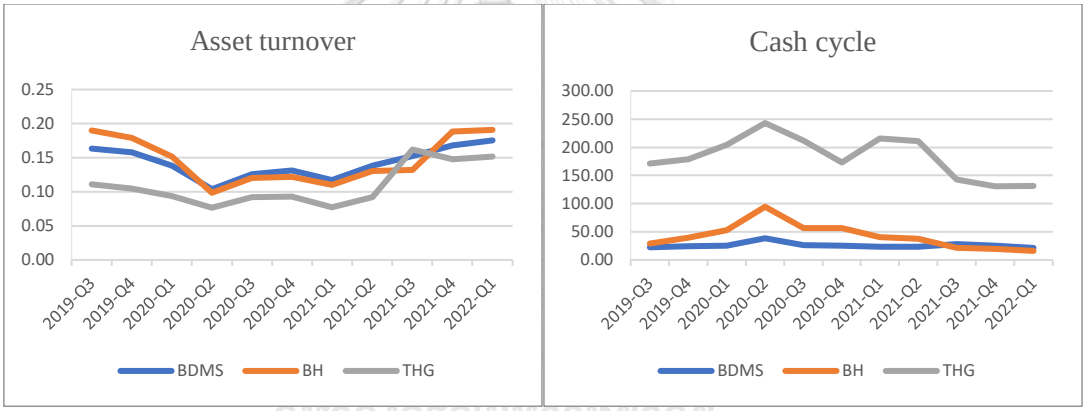


Figure 22: Asset turnover ratio of BDMS, BH and THG (left) and cash cycle of BDMS, BH and THG (right) from Q3/2019 to Q1/2022

In the aspect of hospitals' efficiency, we observed almost the same trends in the asset turnover ratio which show us how good a firm can utilize its asset to generate the sales.

This ratio indicates that all firms performed less efficiently from Q3/2019 to Q2/2020, and then steadily improved until Q1/2022. In that quarter, BDMS and BH were about as efficient as they were in Q3/2019, whereas THG was already more efficient than in Q3/2019. However, throughout this period of time the performance to generate sales from assets of THG was still below the others, despite having the best asset turnover ratio in Q3/2021 at 0.16, which means that if THG had 100 THB worth of assets, its operations could generate 16 THB worth of sales in that quarter. In terms of cash cycle, BDMS had the most consistent and lowest average cash cycle. This means that in comparison to the other two organizations,

BDMS did not have to wait as long to obtain their money back after paying suppliers during this time period. In Q2/2020, BH had to wait about 100 days after paying their suppliers to receive money back from their clients; after that, its cash cycle improved steadily and was lower than BDMS by Q3/2021. THG, on the other hand, had a slightly improved cash cycle throughout this time period, but they still had to wait more than 100 days to obtain their money back from customers after paying for supplier costs. This indicated that, when compared to BH and BDMS, THG had the least negotiating power with both suppliers and customers, and that THG needed to improve if they were to compete with them.

### 6.4 Leverage

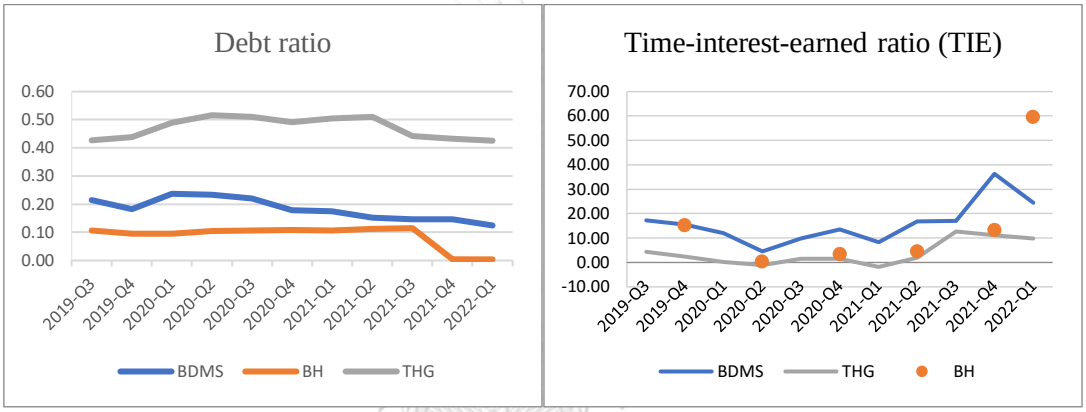


Figure 23: Debt ratio of BDMS, BH and THG (left) and TIE ratio of BDMS, BH and THG (right) from Q3/2019 to Q1/2022

Focusing on the financial burden of the firms, THG had the largest financial debt burden on average with roughly 40 - 50 percent of its assets, without counting other types of burden such as accrual expense, and this did not improve over time. Although this level of debt is not cause for concern at this time, THG will need to modify its debt structure if it wants to compete with BDMS and BH, who both have very low debt levels, accounting for less than 20% of their assets. Since Q4/2021, there has been essentially no debt burden in the BH scenario. For BDMS, its financial debt dropped gradually throughout this time. Investors will be more interested in a company with less debt since it is regarded to be a low financial risk. As a result, this is one of the areas in which THG can develop in order to become more competitive.

The time-interest-earned ratio is another indicator that may be used to determine how much financial debt a company has. It measures how many times a company earns on top of interest expense to show its ability to pay back the interest. The conclusion is the same as in the case of the debt ratio.

According to the TIE graph, because there was no report that BH paid any interest in some quarters due to their very low debt, cash paid for interest was zero in those quarters, resulting in an infinite TIE ratio that could not be put in the same graph to compare. Therefore, BH's figure was plotted as scatter instead. As a result, this indicator shows that, on average, BH earns the most from its operations when compared to paid interest, followed by BDMS and THG, all of which support the debt ratio analysis' conclusion.

### 6.5 Profitability

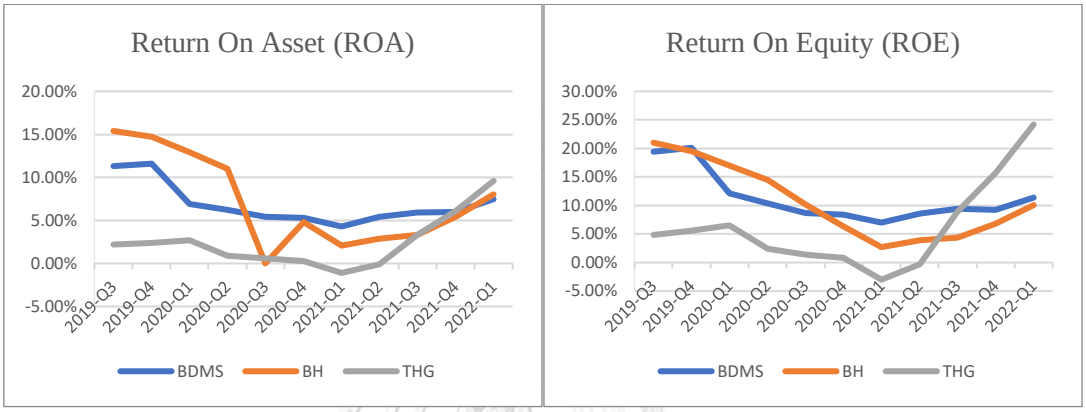


Figure 24: Return on asset of BDMS, BH and THG (left) and return on equity of BDMS, BH and THG (right) from Q3/2019 to Q1/2022

The ROA and ROE of three selected firms appear to be on the same downward trend, reaching a low point in Q1/2021 before turning around and growing since then. We can see from ROA and ROE that the profitability of these three companies has changed over time. In comparison to its asset and equity, BH has a better ability to create return to investors than BDMS and THG by Q4/2020. However, BH's profitability dropped behind BDMS after that, until the Q1/2022, when BH's ROA surpassed BDMS once more and its ROE was only slightly below BDMS.

Meanwhile, due to its very fast increase in sales and net profit at the time, THG's ROE and ROA skyrocketed, surpassing BH and BDMS in Q4/2021.

## 6.6 Brief Summary

| | BDMS | BH | THG |
|---|---|---|---|
| Liquidity | Starting with the lowest proportion of liquid assets, the firm had more liquid assets after getting the huge amount of cash from selling the BH stock in 2020. | On average, the firm had the most proportion of liquid assets over this period, so it had the least insolvency risk. | On average, the firm had the least proportion of liquid assets over this period and in some period, it had current assets below current debt. Therefore, the firm had the highest insolvency risk among 3 firms. |
| Efficiency | BDMS' efficiency in terms of power to negotiate and asset utilization was consistent and did not change much over time. | Although the firm's power to negotiate and asset utilization fell behind BDMS in 2020, it was improved over time and could exceed BDMS after Q3/2021. | The firm still fall behind BDMS and BH in terms of both the asset utilization and the power to negotiate with customers and suppliers as the firm has to wait for more than 5 times that BH and BDMS wait for the money back after paying their suppliers. |
| Leverage | The proportion of financial liabilities for BDMS was quite low with about 20% of debt ratio before COVID and this proportion was declined gradually over time, so the financial risk is low, although it is not as low as BH. | On average, the firm had the lowest proportion of financial debt over this period. After Q3/2021, its financial debt was as low as 0, so it had the least financial risk and also the highest ability to pay back interest. | The firm had the biggest financial debt, accounting for 40-50 percent of its assets, making it the most financially risky among 3 and the ability to pay interest should be of more concern, as THG had a low and even a negative TIE in Q2/2020 and Q1/2021 As a result, it is preferable for THG to change its debt structure. |
| Profitability | BDMS' profitability did not suffer as much at the time. However, it did not return to its pre-COVID level, indicating that its probability has not entirely recovered since being impacted. | BH had the highest profitability at the start, but by Q2/2020, it fell a lot. Since then, its profitability has steadily risen over time, but it has yet to entirely recover. | THG had the lowest and declined profitability before COVID but after reaching the lowest point in Q1/2021, it had the biggest improve in profitability and already exceeded its level prior to COVID pandemic. |

Table 3: The summary of financial performance analysis of BDMS, BH and THG from Q3/2019 to Q1/2022

# 7. Operational statistics analysis

From the comparative financial ratio analysis, we found that these three hospitals had the different financial positions during the COVID pandemic. In this section, we focus on finding the reasons for the different financial performances of those firms by concentrating on analyzing their sales and cost structures because they are the key factors which leads to different financial ratios in many aspects such as having low sales could lead to low asset turnover which implies less efficiency and it also could lead to low ROE and ROA which indicate the lower profitability.

## 7.1 BDMS

### 7.1.1 Revenue analysis

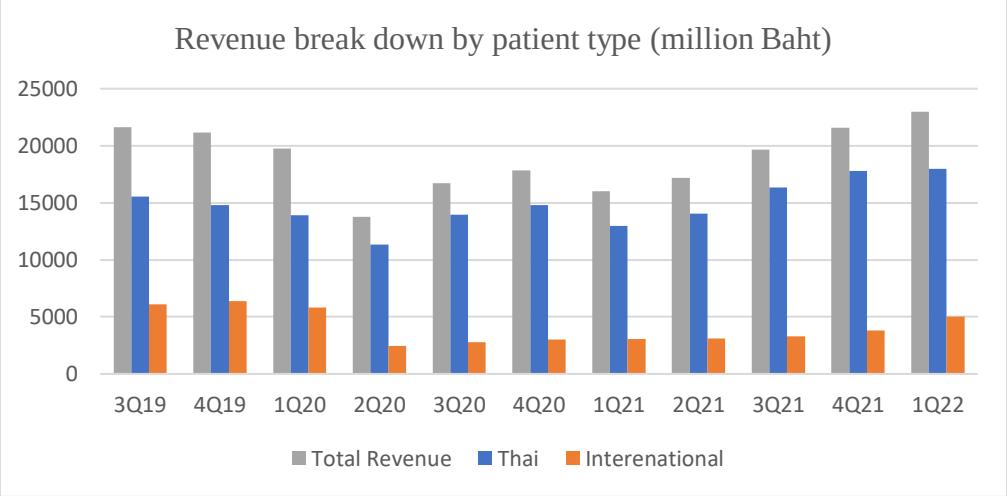


Figure 25: Revenue of BDMS breakdown by patient type
Source: BDMS investor relation website, operational figure



Before COVID pandemic, BDMS's revenue was declining. In Q2/2020, revenue from both Thai and overseas patients fell dramatically, especially the latter, which fell by more than 50%, but revenue progressively rebounded after that. Despite a reduction in revenue from Thai patients in Q1/2021 because of the second wave of the COVID pandemic in Thailand, revenue was still increasing.

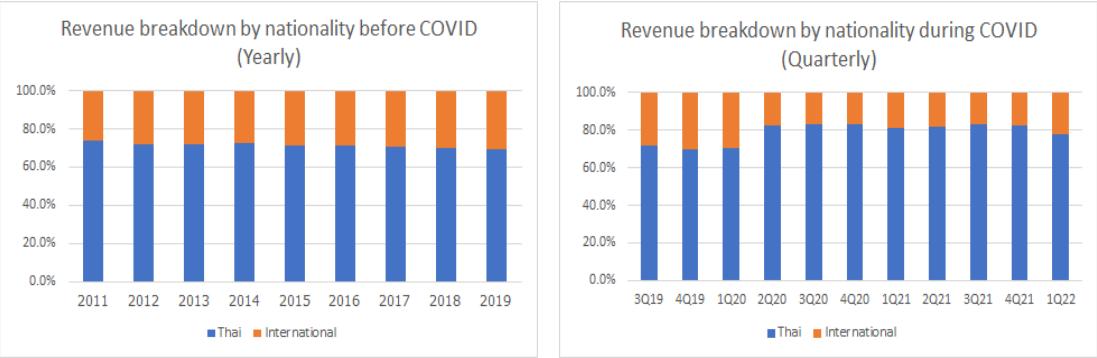


Figure 26: Annual revenue of BDMS breakdown by patient nationality from 2011 to 2019 (left) and Quarterly revenue of BDMS breakdown by patient nationality from Q3/2019 to Q1/2022) (right)
Source: BDMS investor relation website, operational figure

Figure 26 depicts the contribution of BDMS revenue by patient nationality before and during the COVID pandemic. By comparing these two figures (left and right), it is clear that the proportion of international revenue has been declining since Q2/2020 and has just recently risen in Q1/2022. Since 2011, Thai patients have accounted for the majority of BDMS revenue. As a result, when the COVID pandemic hit Thailand and tourism was disrupted by curfews and lockdowns, BDMS' revenue was less affected than that of some hospitals, such as BH, because international patients are not BDMS' primary source of revenue.

In terms of patient type, IPD services accounted for 54% of total income, while OPD services accounted for 46%, and this proportion of IPD and OPD revenue contribution was fairly balanced throughout the period. This suggests that the drop in IPD and OPD services is about evenly distributed among the sources of overall income loss. In more detail, figure 28 indicates that, although the utilization rate had more fluctuations, the OPD visits per day and utilization rate[15] (Orange bar charts) show the same trend which look likes “W”. The two bottom points were in Q2/2020 and Q1/2021 that the first and second wave of COVID pandemic occurred. This reflected that the inpatient group might be sensitive to the COVID scenario more than outpatient group. This basically means that the inpatients who did not have a severe disease might prefer being at home than going to BDMS hospitals due to the uncertainty COVID situation and this leads to the loss in room and services fees for BDMS.

[15] The explanation about utilization rate was mentioned in Research scope, data, and methodology

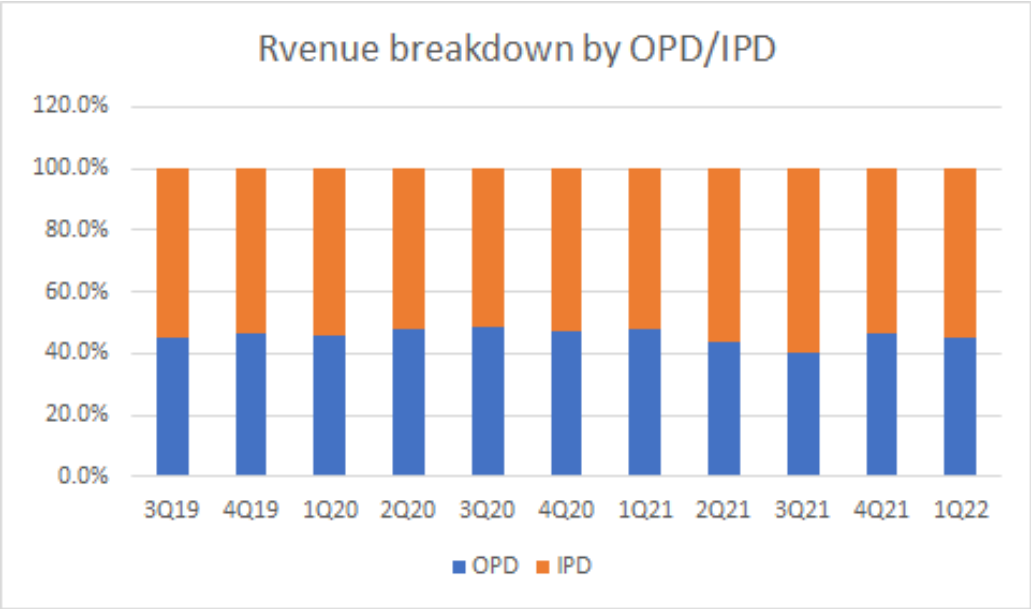


Figure 27: Quarterly revenue of BDMS breakdown by patient type from Q3/2019 to Q1/2022
Source: BDMS investor relation website, operational figure

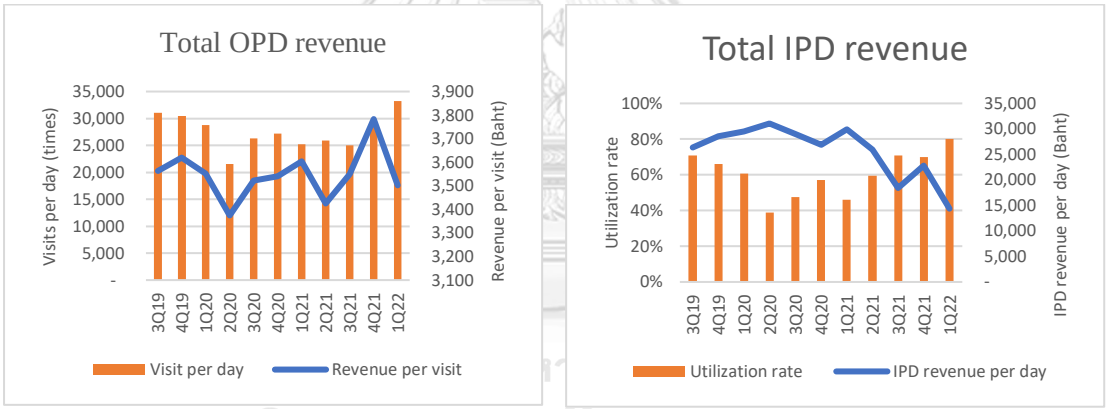


Figure 28: BDMS visits per day and revenue per visit from Q3/2019 to Q1/2022 (left) and BDMS utilization rate and IPD revenue per day from Q3/2019 to Q1/2022 (right)
Source: BDMS investor relation website, operational figure

In the meantime, the revenue per OPD visit stayed at the same level but fluctuated throughout the period. The bottom peaks were in Q2/2020 and Q2/2021 which reinforced the negative effect on Q2/2020 revenue the number of visitors per day and revenue per visit both decreased considerably. For IPD revenue per day, from the start of the COVID pandemic in 2020 through Q1/2021, IPD income per day did not change significantly in contrast with the utilization rate that fell substantially. After Q1/2021, the contrast still occurred, but it is on the reverse side, as utilization increased while IPD revenue per day continued to decline. This indicates that before Q1/2021, the majority of BDMS inpatients were likely patients with severe diseases that required a lot of money for treatment and were unlikely to be able to care

for themselves at home, whereas non-emergency patients who could care for themselves did not want to come to BDMS if possible, so the number of inpatients at BDMS decreased, resulting in a lower utilization rate and a higher average IPD revenue per day. After Q1/2021, non-emergency patients may choose to come to BDMS for admission, resulting in an increase in inpatients, but a decrease in average IPD revenue because these patients likely did not have to pay a lot for their treatment.

Although COVID initially caused BDMS a loss in revenue, it was also one of the causes that assisted in the revenue recovery. As shown in figure 29, Covid-related revenue accounted for a larger proportion of total revenue from Q1/ 2021 to Q3/ 2022, and although this proportion drop gradually after Q3/2022, this Covid-related revenue can mitigate the situation in 2021 and helped in revenue recovery to some extent. However, because of the declining COVID case, this covid-related contribution to overall revenue is likely to decline over time; however, as shown in figure 29 (left), non-covid patients' revenue has already recovered to nearly pre-covid levels as shown in figure 29 (right). The non-covid revenue will compensate for the loss of covid-related revenue and will eventually exceeding the pre-covid level afterwards.

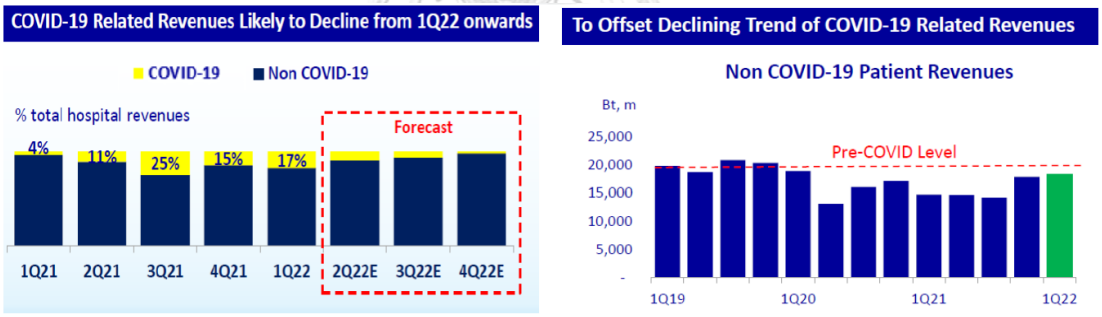




Figure 29: BDMS COVID related revenue from Q1/2019 to Q4/2022(Expected) (left) and BDMS Non COVID related revenue from Q1/2019 to Q1/2022 (right)
Source: Kasikorn research

### 7.1.2 Cost analysis

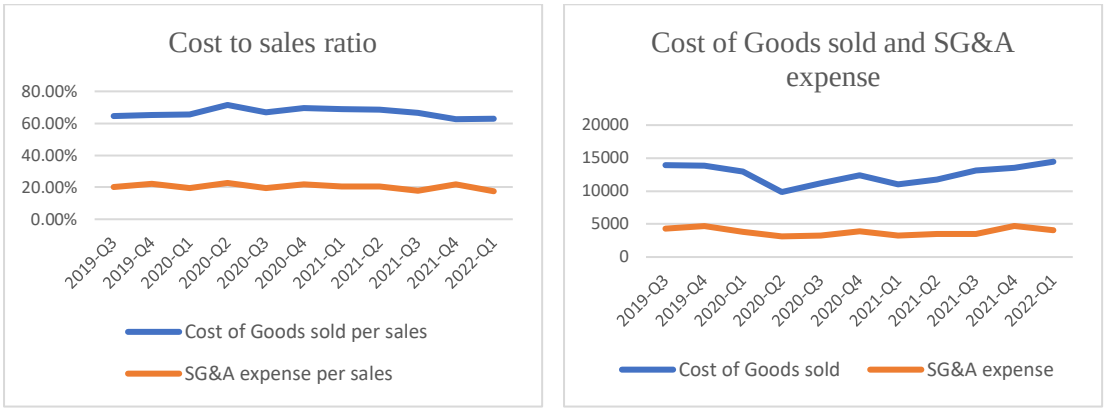


Figure 30: BDMS Cost to sales ratio from Q3/2019 to Q1/2022 (left) and BDMS cost of goods sold and SG&A expense from Q3/2019 to Q1/2022 (right)

BDMS had a good cost management throughout the period as we can see from figure 30 (left). that the level of cost of goods sold and sg&a expense to sales did not change much. From figure 30 (right), we observed that cost of goods sold, and sg&a expense dropped the most in Q2/2020 and dropped again in Q1/2021.

In Q2/2020 the sales dropped slightly more than cost of goods sold and sg&a expense, resulting in a modest increase in the cost-to-sale ratio. Overall, the cost of goods sold and sg&a expense line, however, followed the same pattern as the revenue. When revenue dropped, cost of goods sold dropped at about the same rate, so the cost-to-sales ratio did not change much.



As a result, BDMS suffered less of a negative impact during this time period than BH and THG, as reflected in the decrease in revenue and net profit. The profit of BDMS did not drop as much as the profit of those two companies. For this reason, the profitability and efficiency ratios of BDMS were not as low as those of BH and THG.

One of the reasons why BDMS had better cost management than the other two is that it is the largest healthcare stock, with more than 50 hospitals in Thailand and abroad with a total active bed count of 8,200. As a result, BDMS had more credit and negotiating power than THG and BH, as evidenced by the financial ratio analysis in the previous section. This is where BDMS' competitiveness comes from, and cost control is one of the key areas where BDMS clearly outperformed BH and THG.

## 7.2 BH

### 7.2.1 Revenue analysis

Domestic and international markets are the two main segments of BH's business. Thais in the upper-middle class and above make up the majority of the domestic market. The international market is mostly made up of local expatriates and medical tourists from countries where healthcare facilities and services are lacking in terms of quality, accessibility, and pricing.

Figure 31 clearly illustrates that international patients obviously contributed to the majority of BH's revenue before COVID pandemic in 2020. This implies that BH relied a lot on this customer group.

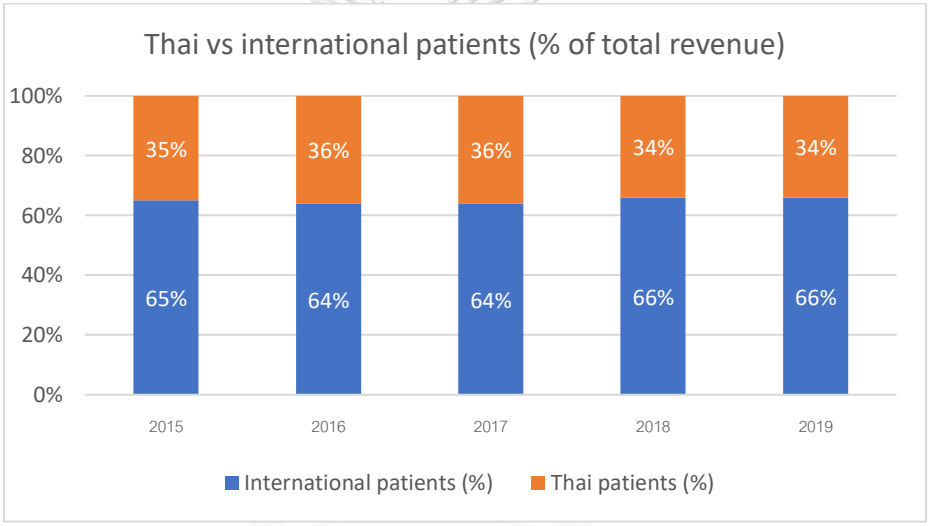


Figure 31: BH Cost of goods sold and SG&A expense from 2015 to 2019
Source: BH 56-1 report,2019



Therefore, when the COVID pandemic started spreading in Thailand at the beginning of 2020, Thai government enacted many policies such as curfew, lockdown and stopping flights which caused an inevitable shock in both the demand, as tourists could not come in, and supply, as some healthcare workers had to work remotely, in the service sectors. This shock had a negative effect for many firms in the sector, especially for the firms whose target group is the tourists. Unfortunately, BH was one of them. Since the government applied policies to control the pandemic in 2020, the BH revenue was drained out. As shown in figure 32, most of the loss in revenue came from the drop in foreign patient revenue which was their target group customer. we can also notice that the revenue from Thai patients also dropped due to curfew and other policies that control the people mobility which forced people do not move

freely across provinces. However, this drop was not much compared with the revenue from international patients.

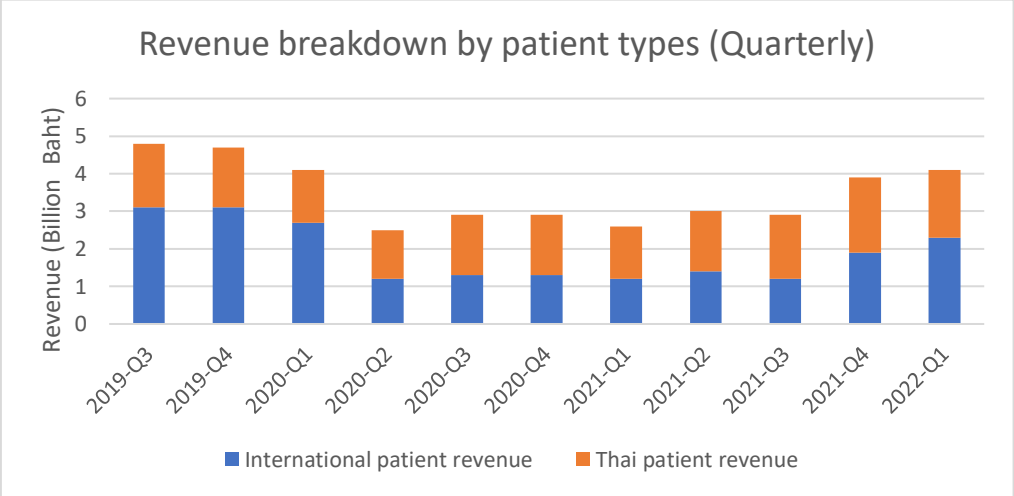


Figure 32: Quarterly BH revenue breakdown by patient types from Q3/2019 to Q1/2022
Source: Finansia Syrus research, BH

Meanwhile, the revenue split between IPD and OPD cases appears to be more evenly distributed. The revenue contribution of the IPD and OPD cases did not change much this period, implying that the fall in overall revenue was due to a roughly equal decrease in both IPD and OPD revenue.

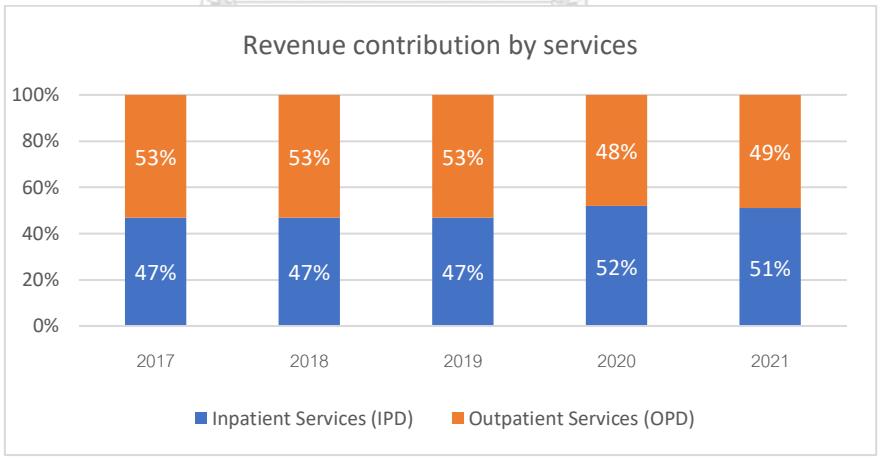


Figure 33: Annual BH revenue contribution by services from 2017 to 2021
Source: BH Annual report,2021

In details for IPD cases, the average admission per day for IPD cases is lower during this period, but the average revenue per admission is higher. This could mean that inpatients at BH in 2020 and 2021 had severe or complex conditions that required immediate treatment, thus they came, whereas individuals with less severe diseases may have chosen to postpone

treatment and did not come to BH. For OPD cases, according to COVID control policies, the average number of visits each day in the OPD is reduced. However, when compared to the IPD number, the revenue per visit did not change significantly.

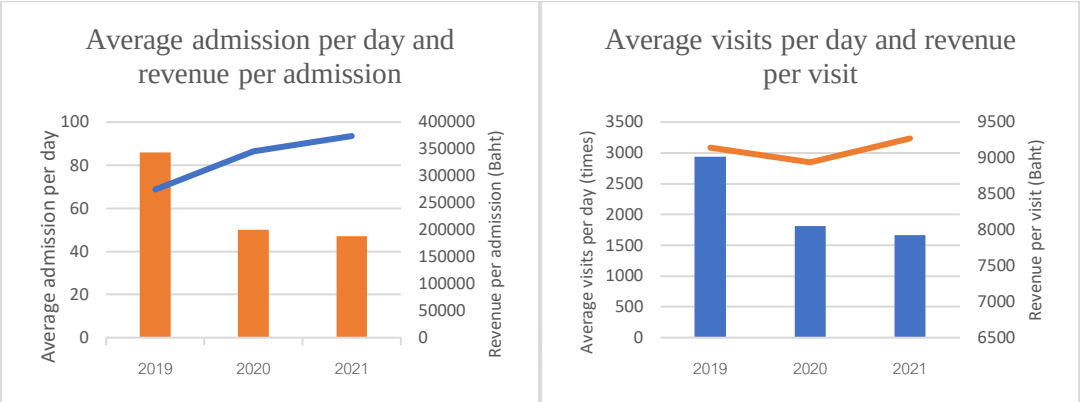


Figure 34: BH's Average admission per day and revenue per admission from 2019 to 2021 (left) and BH visits per day and revenue per visit from 2019 to 2021 (right)
Source: Kasikorn research, BH

Certainly, during COVID pandemic, there were attempts by many hospitals to make profit from this situation by offering services related with COVID such as importing alternative vaccine (Moderna). BH also offered some relevant services such as the alternative vaccines, establishing a COVID-19 Information Center, which answers all questions concerning anything COVID-19 and once things seemed to begin improving, BH established the post-COVID-19 Clinic, which provided solutions for people suffering from COVID-19 and Long COVID.



Anyway, the services which seem to alleviate the situation for BH the most were Alternative State Quarantine (ASQ) and Alternative Hospital Quarantine (AHQ)

ASQ is the service that BH staff will overlook the health care of travelers as per the guidelines established by the Ministry of Public Health, and monitor those entering the Kingdom for a COVID-19 infection for no less than 14 days ,while travelers are in ASQ hotel whereas AHQ service extends to those travelling to Thailand for treatment purposes, whether it is for chronic health conditions and specialist surgical procedures, or for medical and wellness tourism, such as cosmetic surgery and fertility treatment. All patients will be tested for COVID-19 and must remain under observation for a minimum of 14 days even if the treatment is completed in a shorter time as per the criteria and guidelines prescribed by the Thai Government.

By offering this kind of services, international patients who are the target customers of BH could came back, so BH's revenue improved. As shown in figure 35, the contribution of the revenue from AHQ, ASQ and test and go grew over time.

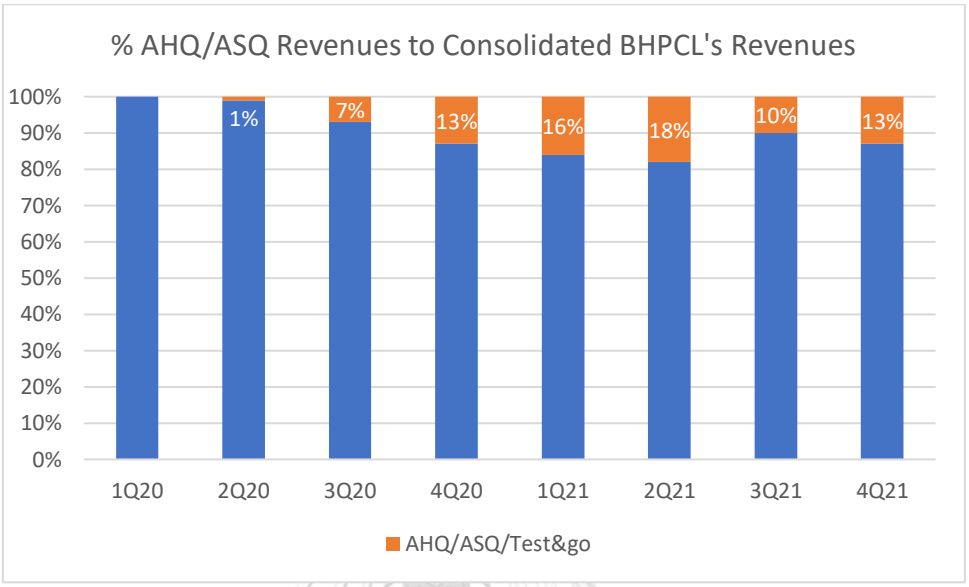


Figure 35: BH's ASQ/AHQ revenue contribution from Q1/2020 to Q4/2021
Source: BH Analyst Meeting 4Q 2021 results 28 February 2022

Although BH's revenue progressively increased after launching these services, it remained smaller than before COVID since Thailand had not yet fully opened up and the number of tourists had not yet rebounded.

### 7.2.2 Cost analysis

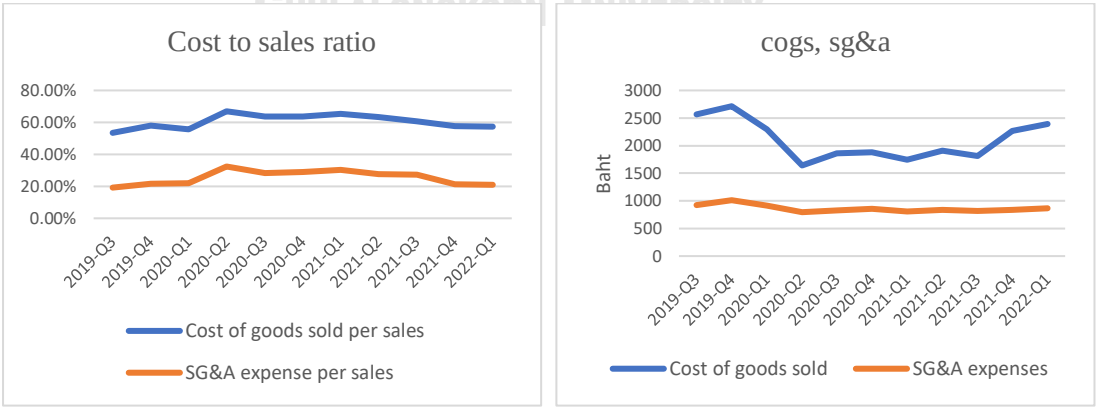


Figure 36: BH Cost to sales ratio from Q3/2019 to Q1/2022 (left) and BH Cost of goods sold and SG&A expense from Q3/2019 to Q1/2022 (right)

Roughly, we saw a decrease in cost of goods sold between 2020 and 2021 due to the lower variable costs, as there were less patients, so fewer variable costs. However, this drop was not so much because the majority of the cost for operating hospital is the fixed cost. Normally, to run a hospital business, it required many fixed assets such as the hospital facilities and medical equipment. Therefore, the cost did not fall as much, while SG&A expense approximately did not change.

Because sales decreased more than cost, the cost of goods sold per sales and the SG&A expense per sales increased during 2020-2021. As a result, the gross margin and operating margin went down, especially in Q2/2020, the operating margin was nearly 0.

In conclusion, as the sales went down at the higher rate than the decreasing rate of the cost, the profit was lower while the asset and equity did not change much. As a result, the firm had lower profitability ratios, observed from the financial statement, and then recovered after the recovery of the sales after Q1/2021. In the efficiency aspects, as the sales was lower while the asset did not change much, asset turnover ratio was lower which explained the lower efficiency of the firm between 2019 - 2020. In addition, lower profit means lower earning so the BH's ability to pay interest went down as we observed the declining TIE ratio that indicates the higher leverage in section 4. However, BH still was not financial risky, although BH's net earnings was lower which made the lower TIE ratio, because BH contained a very low level of debt.

## 7.3 THG

### 7.3.1 Revenue analysis



The source of THG revenue consists of three businesses including medical services business which accounted for 90% before COVID, healthcare solutions provider business (9.2% before COVID) and other businesses such as land development (0.8% before COVID)**.**[16]

When the COVID epidemic hit Thailand in 2020, income from both medical services and healthcare solutions providers plummeted, especially for affiliates whose target group is international patients. Patients did not want to come to the hospital to prevent getting COVID disease, so revenue from Thai patients reduced as well.

The number of OPD sequences, which indicates the number of OPD patients, is shown as a bar plot in figure 37 (left), and the pay per sequence is shown as a line plot in figure 37 (left),

[16] Retrieved from THG 2021 Annual report

for Thonburi 1, Thonburi 2, and Rajyindee Hospital, which are the three primary hospitals for THG.

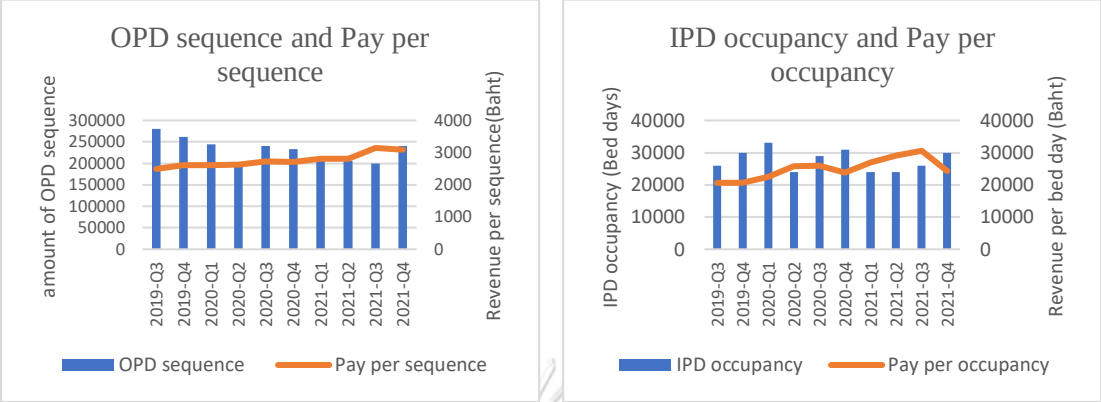


Figure 37: THG OPD sequence and revenue per visit from Q3/2019 to Q1/2022 (left) and THG IPD occupancy rate and IPD revenue per occupancy from Q3/2019 to Q1/2022 (right) Source: THG investor presentation slide in THG business relation website.

We can see that the number of OPD sequences has been decreasing since before the COVID pandemic and has hit a minimum in Q2/ 2020, due to lockdown and curfew restrictions. Then, it steadily recovered during a period of volatility caused by the second and subsequent waves of the COVID epidemic, The number of OPD sequences had not entirely recovered yet in Q1/2022. However, billing per sequence increased over time, implying that patients paid more for services overall, owing to the hospital's ability to provide more expensive and intricate therapy to patients.

On the IPD side, figure 37 (right) depicted the opposite pattern to figure 37 (right) between Q3/2019 and Q1/2020. At the time, the amount of bed occupancy was on the rise, while OPD sequences fell. Aside from that part, both figures (left and right) show the similar trend.

Not only did the hospital business suffer from the consequences of COVID restrictions, but the healthcare solutions provider firm also experienced a loss in revenue. Thonburi Wellness Co., Ltd., a major THG subsidiary in the healthcare solutions provider business that manages Jin wellbeing county, the resident with medical services such as clinic and spa, has also got a detrimental impact from COVID.

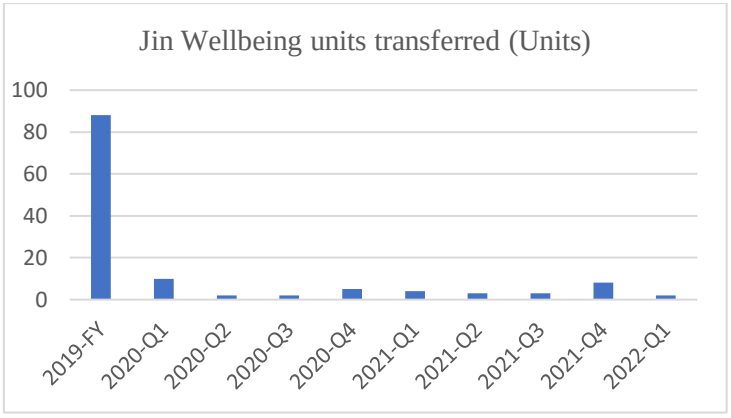


Figure 38: Jin Wellbeing units transferred from FY2019 to Q1/2022
Source: Finansia syrus research

Figure 38 shows the Jin Wellbeing units transferred since the first year of COVID pandemic in Thailand (2020) compared with the units transferred in the year before. we can see that in 2019, 88 units of Jin wellbeing were sold and transferred to customers (on average, 22 units transferred per quarter), but after Q1/ 2020 The units sold and transferred never reached 10 units per quarter. this led to a huge decline in the revenue. In 2019, THG got 756.5 million Baht from the healthcare solutions provider business. this number fell to 386.85 million Baht in 2020 and rebound slightly to 410 million baht in 2021 which was still approximately only 50% of its level before COVID. The main reason is that customers postpone their purchasing decision because of uncertainty COVID situation. [17]

As two main businesses of THG got affected, THG's revenue sank and experienced a loss especially in Q2/2020 and Q1/2021 that they have a negative number of net profit due to the first and second wave of COVID pandemic.

However, THG saw an opportunity in the crisis; although losing a significant revenue owing to the COVID pandemic, they adapted to capitalize on the situation by offering a variety of COVID-related services. THG, for example, was one of the first hospitals to publicly insist on importing Moderna, the alternative vaccine. Dr.Boon Vanasin, chairman and founder of THG, was interviewed by many TV programs regarding the issue of importing Moderna vaccine, and it became the talk of the town for a while. This keeps THG in the news, and more people knew THG and have made vaccine reservations as a result. On June 3, 2021, the news

[17] Retrieved from: THG 2021 annual report

reported that three days after THG opened reservations for the Moderna vaccination, approximately a million people had signed up.[18]

Apart from alternative vaccines, THG also introduced other services such as Hospitel, RT-PCR diagnostic, and also constructing a field hospital which generated a lot of profit to THG.

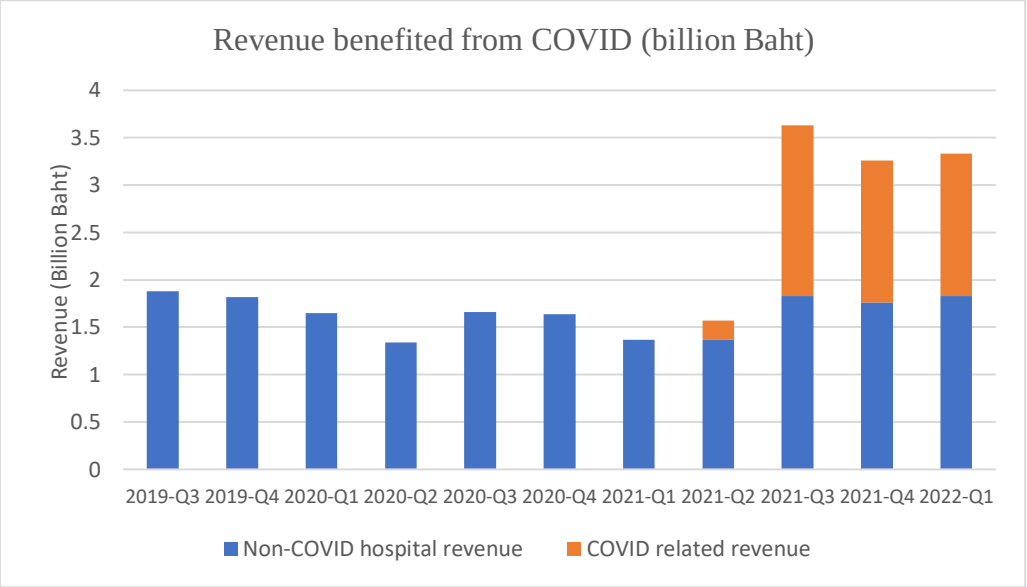


Figure 39: THG Revenue which was benefited from COVID between Q3/2019 to Q1/2022
Source: Finansia syrus research

The COVID-related services boosted total revenue considerably, surpassing the level of revenue before COVID pandemic, as seen in figure 39. THG had the greatest level of COVID related revenue of 1.8 billion baht in Q3/ 2021, which was virtually the same as revenue from non-covid hospital revenue of 1.83 billion baht.

Finally, while the COVID pandemic initially harmed THG, it was also the turning point that allowed THG to shift from a loss to a gainer after 2020.

[18] Retrieved from: https://www.thansettakij.com/general-news/482519

### 7.3.2 Cost analysis

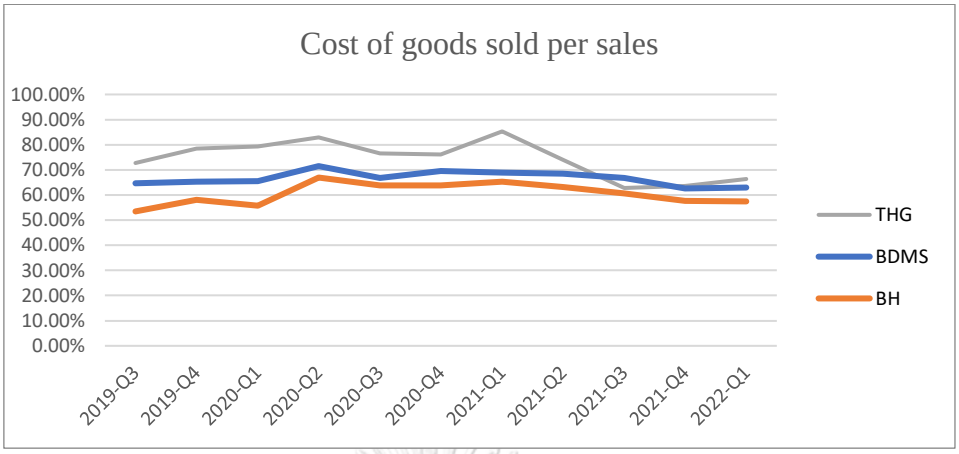


Figure 40: The comparison of BDMS, BH and THG Cost to sales ratio (Q3/2019 - Q1/2022)
Source: BDMS, BH and THG annual report 2021

Figure 40 shows that the cost of goods sold per sale for THG reduced in 2021 as a result of the substantial increase in sales from COVID related services, while the cost increased at a slower rate than the income. However, when compared to BDMS and BH, THG had the highest cost of goods sold per sale, implying that cost management is one of the firm's issues that should be improved. We witnessed the peaks of this ratio in Q2/2020 and Q1/2021, which were the two quarters in which THG had a negative net profit.

In more details, we discovered that in Q2/2020, THG had to pay for accruing expenses in the construction of Thanarad Thung Song Hospital and Thonburi Bamrungmuang Hospital, both of which had been opened in 2019, as well as medical equipment and landscape development costs[19], whereas in Q1/2021, apart from the loss in revenue due to second wave of COVID pandemic, THG had a cost in construction a field hospital and the rent of a hotel for hospitel service.[20]

THG borrowed money from a bank to cover these expenses, which explains why they had a higher debt ratio in FY2020-Q2/2021 and a lower TIE ratio, implying greater financial risk. THG's costs increased because of the borrowings, while its revenue decreased. As a result, they had lower net profit during the time, and in Q2/2020 and Q1/2021, they even had a negative net profit. In the meantime, their asset and equity values did not change much, so the firm had lower profitability ratios and lower efficiency ratio.

[19] Retrieved from: THG 2020 annual report
[20] Retrieved from: THG 2021 annual report

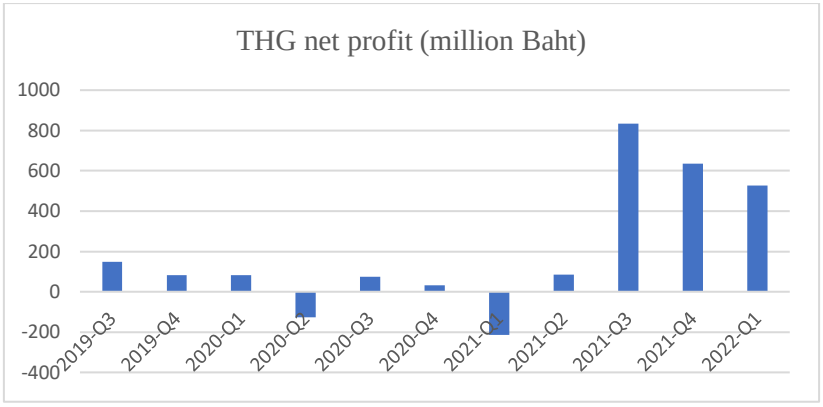


Figure 41: THG net profit from Q3/2019 to Q1/2022
Source: THG annual report 2021

However, this loss was compensated by the COVID-related revenue that push the revenue beyond pre-COVID level and leads to the improvement in efficiency and profitability of the firm.

## 7.4 Summary of operational statistics analysis

### 7.4.1 BDMS

Among 3 firms, BDMS had the least negative impact on revenue and net profit during the period of the time. One of the main reasons is that BDMS kept costs under control and sales did not drop significantly because international patients did not account for the majority of revenue in the first place. As a result, when COVID hit and the tourism sector saw a drop in demand due to lockdown, curfew, and other policies, BDMS did not suffer as much as the other two. Meanwhile, revenue from COVID-related services helped to alleviate the situation while also strengthening the overall revenue recovery, which has already exceeded the pre-COVID level in Q3/2021. Following that, the revenue continues to rise steadily.

### 7.4.2 BH

Because international patients, who accounted for more than 60% of total income, were unable to visit Thailand, BH suffered a significant drop in sales and net profit. Fortunately, although the revenue decreased drastically, BH was able to keep costs under control enough to avoid a negative net profit for the entire period. However, the massive decline in sales still led to extremely low profit margin because the cost fell less than the sales. Even though BH offered COVID-related services in 2021 to increase revenue, the loss in overseas patient revenue could not be compensated. In Q1/2022, total revenue had not yet approached the pre-COVID level, despite the fact that revenue had been gradually increasing for some time.

7.4.3 THG

Due to the first and second waves of the COVID pandemic in Thailand, THG got the most negative impact on revenue and net profit over the period in comparison to BDMS and BH, with a negative net profit two times in Q2/2020 (-126 million Baht) and Q1/2021 (-215 million Baht). The key reason was that the COVID crisis created uncertainty, which impacted demand not only in THG's main industry (hospitals), but also in its other businesses (operating the resident with medical services). THG cost management was also lacking compared with BH and BDMS, as various costs arose over the period. For example, COVID-related costs such as COVID-relevant medical equipment (smock) and field hospital building costs, while THG also had to pay accrued expenses in the construction of Thanarad Thung Song Hospital and Thonburi Bamrungmuang Hospital.

However, THG was able to adapt well as they introduced many COVID-related services before others and these services generated a lot of profit that push the total revenue to be more than 3.5 billion baht in Q3/2021 which was more than enough to compensate a loss before. These services, however, generated less profit as the number of COVID patients continued to decline, and revenue from this sort of service was not expected to be profitable in the long run. THG has already profited from the COVID crisis, but how far this profit will take THG is remained as a question.

## 8. Projected revenue and profitability

Based on the comparative analysis in Section 4.3, we could project some financial ratios of BDMS, BH and THG for the next few years by using a simple method in order to explore how the financial ratios with key differences among three firms would evolve in the future. We will mainly concentrate on the revenue and profitability ratios because they are important to many individuals, and they are always monitored. For examples, profitability ratios are important to creditors because they show the company's ability to satisfy interest obligations and it is also important to shareholders as it indicates the progress and the rate of return on their investments. (Kabajeh et al., 2012) In addition, we notice in Section 4.3 that the profitability of these three firms changed their orders throughout the period. For instance, at the beginning, BH had the best profitability and BDMS was the second best follow by THG in the third place, then during 2020, BH profitability dropped behind BDMS but still more than THG. After 2021, THG’s profitability rose exceeding BH and BDMS. Therefore, it is important to discover how this difference in profitability among three firms would evolve in the future as for investors it would affect the investment strategies while also affect the loan decision for creditors.

The profitability ratios that we will focus on in this section are the ratios of the return on assets (ROA) and the return on owner's equity (ROE) which are the most used profitability ratios in the analysis. (Kabajeh et al., 2012) Therefore, we recall the ROA and ROE formula.[21]

$$ROA = \frac{Net\ profit}{Asset}$$

$$ROE = \frac{Net\ profit}{Equity}$$

Where

$$Net\ profit = EBIT(1 - Tax\ rate) - Paid\ interest$$

$$EBIT = Revenue - Cost\ of\ goods\ sold - \text{selling, general and administrative expenses}$$

From these formulas, we notice that to project ROA and ROE, we have to predict the relevant financial variables of the firms including revenue, cost of goods sold, selling, general and administrative expenses, tax rate, paid interest, total asset and total equity. And we calculate these predicted variables based on different methods. The methods for calculating each predicted variable are shown below.

## 8.1 Revenue

To project the revenue of each firm for the next few years, we start by analyzing the revenue structure first.

### 8.1.1 BDMS

For BDMS, two main sources of the revenue are from hospital business and the other businesses including the laboratories and selling medicines.

For hospital business, we can separate the revenue into total OPD and total IPD revenue. Total OPD revenue is calculated from average visits per day times 365 times revenue per visit, while Total IPD revenue is calculated from average admission per day times 365 times revenue per admission. Therefore, to forecast total revenue from hospital business, we need to predict average visits per day, revenue per visit, average admission per day and revenue per admission which would require a deep understanding in healthcare industry and take a lot of

[21]The explanation about ROA and ROE was mentioned in Research scope, data, and methodology

time to do it. In this study, we will refer to the forecast of these 4 variables by Kasikorn securities[22] and their forecast were as shown in the table below.

| Variables | Unit | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| Average visits per day | times | 29,556 | 32,022 | 33,437 |
| Revenue per visit | Baht | 3,461 | 3,323 | 3,354 |
| Average admission per day | times | 1,371 | 1,754 | 1,913 |
| Revenue per admission | Baht | 86,689 | 72,299 | 71,937 |

Table 4: BDMS Average visits per day, Revenue per visit, Average admission per day and Revenue per admission during 2022 – 2024 forecasted by Kasikorn securities

According to Kasikorn researcher, the number of BDMS inpatients and outpatients will increase in 2023 as a result of lower COVID limitations, which will lead to a recovery in the number of both Thai and international patients. this number of patients will continue to climb in 2024. However, revenue per visit and revenue per admission in 2022 may be lower to nearly the level before COVID pandemic.

From this information, we can find total OPD and total IPD revenue and then total revenue from hospital business from 2022 to 2024 as shown in table 5.

| Variables | Unit | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| Total OPD revenue | Baht | 37,337,060,340 | 38,839,323,690 | 40,933,909,770 |
| Total IPD revenue | Baht | 43,380,475,935 | 46,286,542,790 | 50,229,650,565 |
| Total revenue from hospital business | Baht | 80,717,536,275 | 85,125,866,480 | 91,163,560,335 |

Table 5: BDMS Total OPD revenue, Total IPD revenue and Total revenue from hospital business during 2022 – 2024

| Variables | Unit | Year | | | | |
|---|---|---|---|---|---|---|
| | | 2017 | 2018 | 2019 | 2020 | 2021 |
| Revenue from other business | Million Baht | 2809.58 | 3086.75 | 3092.35 | 2907.62 | 2910.4 |

Table 6: BDMS Total revenue from other business during 2017 – 2021

According to table 6, we found that the sales from the other businesses including the laboratories and selling medicines did not significantly change in the past five years from

[22] KS research strategy (2022 May 24), BDMS analysis retrieved from: https://www.kasikornsecurities.com/th/research/company-analysis/LaLg4x

2017 to 2021.[23] Therefore, we would use the average of it (2961.34 million Baht) as a representative of the revenue from the other businesses including the laboratories and selling medicines in the next few years in the forecast process. After that, we combine the revenue from both businesses together. Then, we get a predicted total revenue as shown in table 7.

| Variables | Unit | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| Total OPD revenue | Million Baht | 37,337 | 38,839 | 40,934 |
| Total IPD revenue | Million Baht | 43,380 | 46,287 | 50,230 |
| Total revenue from hospital business | Million Baht | 80,718 | 85,126 | 91,164 |
| Revenue from other business | Million Baht | 2,961 | 2,961 | 2,961 |
| Total BDMS revenue | Million Baht | 83,679 | 88,087 | 94,125 |

Table 7: The forecast of BDMS Total revenue from each business during 2022 – 2024

### 8.1.2 BH

In contrast to BDMS, hospital business accounts for 99 percent of BH revenue.[24] As a result, we did not need to divide the revenue into two halves as we did in 5.1.1, and we assumed that BH total revenue would be equal to only hospital business revenue. Therefore, the predicted total revenue of BH was then computed using the same method as the total revenue from hospital business part of the BDMS. Then, we get a predicted total revenue for BH as shown in table 8.

| Variables | Unit | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| Average visits per day | times | 2,176 | 2,778 | 2,850 |
| Revenue per visit | Baht | 10,809 | 10,376 | 10,480 |
| Total OPD revenue | Million Baht | 8,585 | 10,521 | 10,902 |
| Average admission per day | times | 66 | 81 | 83 |
| Revenue per admission | Baht | 370,794 | 342,984 | 345,385 |
| Total IPD revenue | Million Baht | 8,932 | 10,140 | 10,463 |
| Total BH revenue | Million Baht | 17,517 | 20,661 | 21,365 |

Table 8: The forecast of BH Total revenue from each business during 2022 – 2024

Remarks: For the non-highlighted 4 variables, we refer to the forecast by Kasikorn securities just the same as we did in BDMS part.

[23] BDMS's 2018 and 2021 annual report, Retrieved from: https://investor.bangkokhospital.com/en/downloads/annual-report
[24] BH's 2020 Annual report, Retrieved from: https://investor.bumrungrad.com/ar.html

Due to lower COVID limitations, Kasikorn researcher believes that the number of inpatients and outpatients at BH will increase considerably in 2023, resulting in a rebound in the number of tourists. International patients, who are BH's largest client group, would return in 2024, and the number of patients would continue to rise. However, revenue per visit and revenue per admission may be lower in 2023 than in 2022 because most of the patients who visited a hospital during COVID pandemic were the patients who had serious or complex diseases for which treatment could not be delayed.

This type of patients paid high price for the services which pushed the average revenue per visit and average revenue per admission up during 2019 -2022. However, after practically everything returns to normal after 2022, these figures will decline.

### 8.1.3 THG

For THG, two main lines of business are hospital business and the other business (mainly healthcare solutions provider business, which is more in the real estate business). Therefore, to predict the revenue of THG we need to forecast revenue from both businesses, so we computed the predicted revenue from hospital business using the same method as we did for the total revenue from hospital business section of BDMS and BH. We also refer to Kasikorn Securities' projection for real estate revenue because predicting demand and revenue requires considerably more technical expertise, which is beyond the scope of this study.

By applying the above methods, we get a result as shown in table 9.

| Variables | Unit | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| Average visits per day | times | 2,718 | 2,855 | 2,860 |
| Revenue per visit | Baht | 2,773 | 2,690 | 2,717 |
| Total OPD revenue | Million Baht | 2,751 | 2,803 | 2,836 |
| Average daily census | times | 333 | 360 | 373 |
| Revenue per census | Baht | 25,799 | 24,303 | 23,646 |
| Total IPD revenue | Million Baht | 3,136 | 3,193 | 3,219 |
| Total revenue from hospital business | Million Baht | 5,887 | 5,997 | 6,056 |
| Total revenue from other business | Million Baht | 6,277 | 2,478 | 2,643 |
| Total THG revenue | Million Baht | 12,164 | 8,475 | 8,699 |

Table 9: The forecast of THG Total revenue from each business during 2022 – 2024

According to Kasikorn's analysis, the average number of outpatients and inpatients for THG will progressively recover, resulting in a steady recovery in hospital revenue in 2023 and 2024. The revenue from other business, on the other hand, would plummet in 2023, owing to

Kasikorn's belief that revenue from COVID-related services, which accounted for the majority of the revenue from other business section between 2019 and 2022, would plummet significantly as the COVID situation shifts from pandemic to epidemic and becomes less severe. After 2022, total revenue would be much lower as a result of this.

### 8.2 Cost of goods sold, SG&A expenses and Tax rate

These three factors were forecasted based on each firm's historical data, except FY2020 and 2021 in order to eliminate the effects of the COVID epidemic, which significantly harmed the financial performance of many corporations across various sectors in the years 2020 and 2021. Consider the historical Cost of goods sold per sales, SG&A expenses per sales and Tax rate per sales from 2015 to 2019, we can see that overall, these three ratios did not significantly change (no significant trend) over this period as shown in figure 42 and 43.

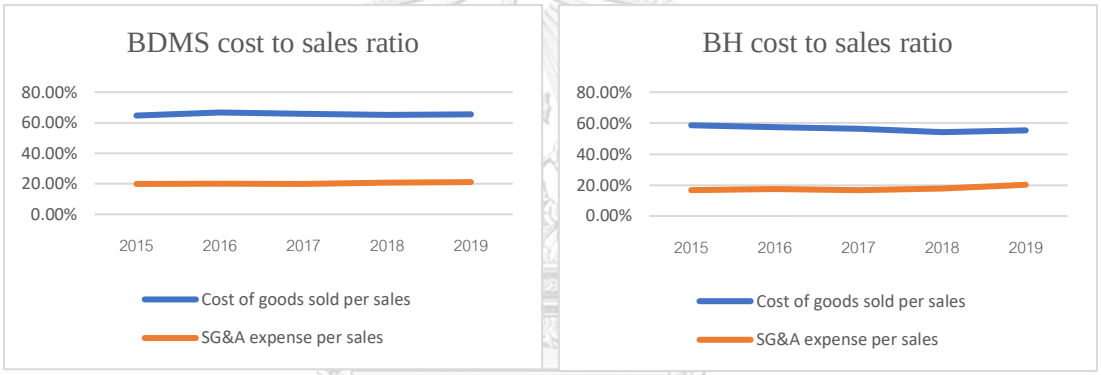


Figure 42: BDMS cost to sales ratio during between 2015 and 2019 (left) and BH cost to sales ratio during between 2015 and 2019 (right)

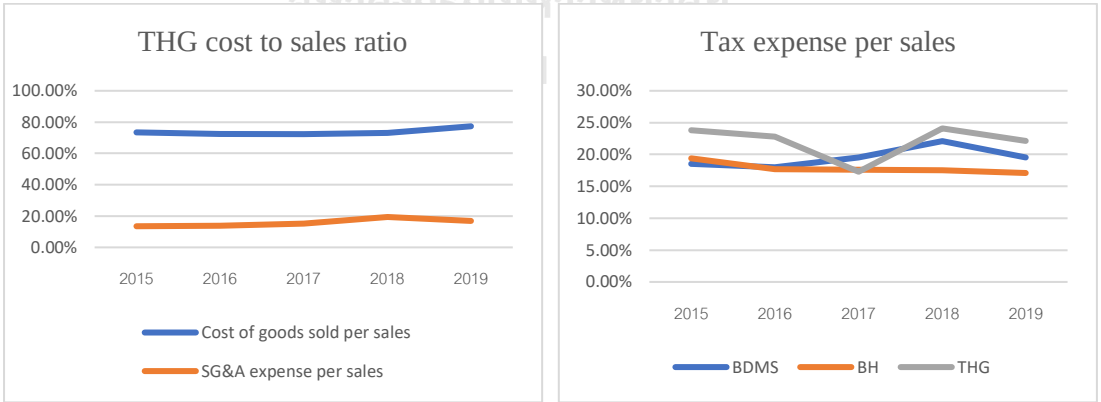


Figure 43: THG cost to sales ratio during between 2015 and 2019 (left) and cost to sales ratio during between 2015 and 2019 (right)

As a result, we will take the average of them as representatives for prediction, providing the average for each ratio as shown in table 10.

| Firms | variables | value |
|---|---|---|
| BDMS | Average cost of goods sold/sales | 65.63% |
| | Average SG&A expenses/sales | 20.34% |
| | Average Tax rate | 19.52% |
| BH | Average cost of goods sold/sales | 56.40% |
| | Average SG&A expense /sales | 17.76% |
| | Average Tax rate | 17.86% |
| THG | Average cost of goods sold /sales | 73.78% |
| | Average SG&A expenses/sales | 15.76% |
| | Average Tax rate | 22.02% |

Table 10: The average cost of goods sold/sales, average SG&A expenses/sales, and Average Tax expense rate of BDMS, BH and THG during 2015 – 2019

From table 10, we can calculate the cost of goods sold, selling, general and administrative expenses and tax rate of each firm from 2022 to 2024 by substituting the forecast revenue of each firm got from 8.1 into the ratios that shown in table 10. The result is shown in table 11.

| Firms | variables | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| BDMS | Expected revenue (million Baht) | 83,679 | 88,087 | 94,125 |
| | Expected cost of goods sold (million Baht) | 54,920 | 57,813 | 61,776 |
| | Expected SG&A expenses (million Baht) | 17,020 | 17,917 | 19,145 |
| | Expected Tax rate (%) | 19.52% | 19.52% | 19.52% |
| BH | Expected revenue (million Baht) | 17,517 | 20,661 | 21,365 |
| | Expected cost of goods sold (million Baht) | 9,880 | 11,654 | 12,051 |
| | Expected SG&A expenses (million Baht) | 3,111 | 3,669 | 3,794 |
| | Expected Tax rate (%) | 17.86% | 17.86% | 17.86% |
| THG | Expected revenue (million Baht) | 12,164 | 8,475 | 8,699 |
| | Expected cost of goods sold (million Baht) | 8,974 | 6,253 | 6,418 |
| | Expected SG&A expenses (million Baht) | 1,917 | 1,336 | 1,371 |
| | Expected Tax rate (%) | 22.02% | 22.02% | 22.02% |

Table 11: The forecast of average cost of goods sold, average SG&A expenses and Average Tax expense rate of BDMS, BH and THG between 2022 and 2024

### 8.3 Paid interest, total assets, and total equity.

To forecast the amount of interest paid, assets held, and equity held by each firm in the future, we require information from within each firm, as it is dependent on the firm's policy and executive decisions on debt management plans, which might vary over time and are not always made public. As a result, we also use Kasikorn Securities' projection for these three

variables because they have much more inside and reliable information. The forecast is shown in table 12.

| Firms | variables (unit: million Baht) | Year | | |
|---|---|---|---|---|
| | | 2022 | 2023 | 2024 |
| BDMS | Expected paid interest | 631 | 442 | 324 |
| | Expected total asset | 128,925 | 127,643 | 129,079 |
| | Expected total equity | 91,473 | 94,703 | 97,839 |
| BH | Expected paid interest | 2 | 0 | 0 |
| | Expected total asset | 22,333 | 25,222 | 28,208 |
| | Expected total equity | 18,695 | 21,188 | 24,027 |
| THG | Expected paid interest | 278 | 209 | 187 |
| | Expected total asset | 21,901 | 20,556 | 20,068 |
| | Expected total equity | 11,021 | 10,970 | 11,254 |

Table 12: The forecast of paid interest, total asset and total equity of BDMS, BH and THG between 2022 and 2024 by Kasikorn Securities

## 8.4 Projected revenue and profitability

After we finished calculating the predicted variables according to the methods shown in section 5.1,5.2 and 5.3, we substitute the variables for each year back into the equation 5.1, 5.2, and 5.3, so we can project the revenue, net profit, ROE and ROA as shown in table 13, figure 44 and 45.

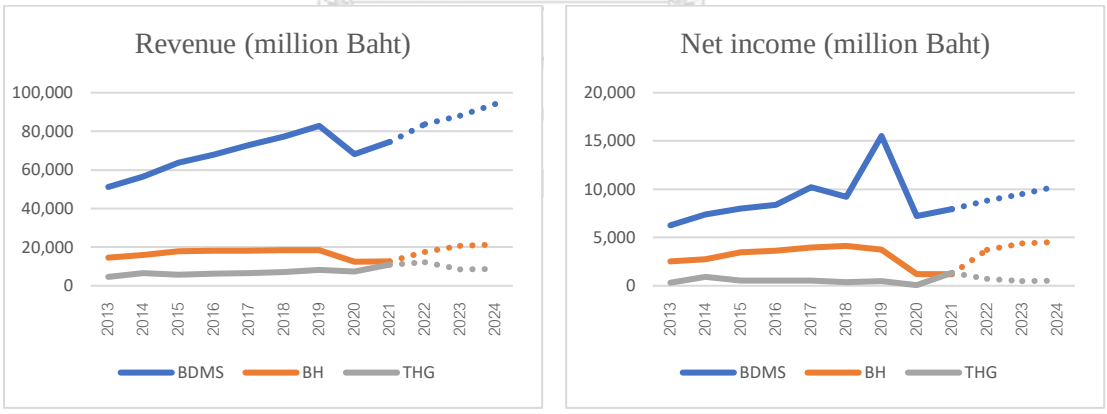


Figure 44: Total revenue of BDMS, BH and THG between 2013 and 2024 including the forecast from 2022 to 2024 (left) and net income of BDMS, BH and THG between 2013 and 2024 including the forecast from 2022 to 2024 (right)

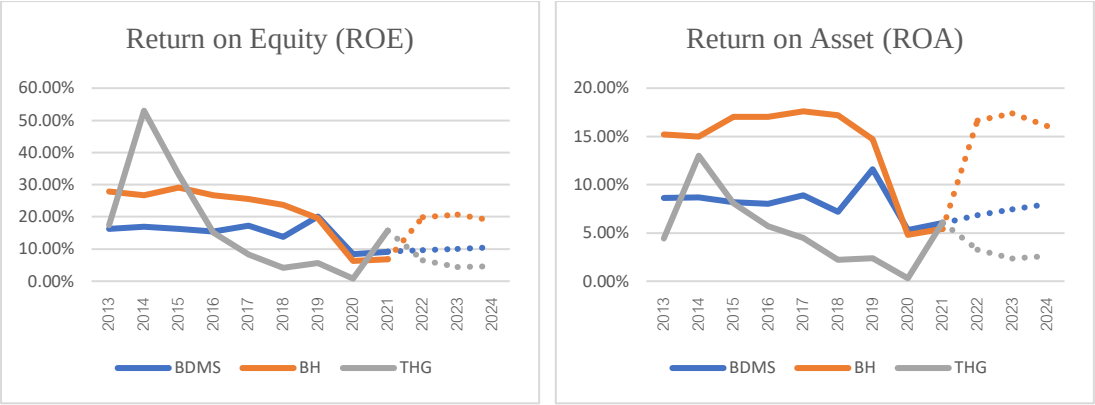


Figure 45: ROE of BDMS, BH and THG between 2013 and 2024 including the forecast from 2022 to 2024 (left) and ROA of BDMS, BH and THG between 2013 and 2024 including the forecast from 2022 to 2024 (right)

| firms | variables | unit | Year | | |
|---|---|---|---|---|---|
| | | | 2022 | 2023 | 2024 |
| BDMS | revenue | million Baht | 83,679 | 88,087 | 94,125 |
| | Gross profit | million Baht | 28,759 | 30,274 | 32,349 |
| | EBIT | million Baht | 11,739 | 12,357 | 13,204 |
| | Net income | million Baht | 8,816.45 | 9,503.12 | 10,302.82 |
| | ROA | % | 6.84% | 7.45% | 7.98% |
| | ROE | % | 9.64% | 10.03% | 10.53% |
| BH | revenue | million Baht | 17,517 | 20,661 | 21,365 |
| | Gross profit | million Baht | 7,637 | 9,007 | 9,314 |
| | EBIT | million Baht | 4,526 | 5,338 | 5,520 |
| | Net income | million Baht | 3,715.29 | 4,384.48 | 4,533.87 |
| | ROA | % | 16.64% | 17.38% | 16.07% |
| | ROE | % | 19.87% | 20.69% | 18.87% |
| THG | revenue | million Baht | 12,164 | 8,475 | 8,699 |
| | Gross profit | million Baht | 3,190 | 2,222 | 2,281 |
| | EBIT | million Baht | 1,273 | 887 | 910 |
| | Net income | million Baht | 714.39 | 482.43 | 522.70 |
| | ROA | % | 3.26% | 2.35% | 2.60% |
| | ROE | % | 6.48% | 4.40% | 4.64% |

Table 13: The forecast of revenue, gross profit, EBIT, net income, ROA and ROE of BDMS, BH and THG between 2022 and 2024

### 8.4.1 Revenue and Net profit

Over the next few years, the projected revenue of BDMS and BH have the same trend as their projected net profit. For BDMS, the number of overseas patients, particularly those from the Middle East and patients from CLMV nations, is predicted to rise steadily, while local demand from Bangkok and other provinces is expected to recover after 2021. After a COVID pandemic, demand for non-COVID-related services will continue to rise. The BDMS investor relations team reported a "good" recovery in outpatients and an "outstanding" recovery in inpatients, particularly patients with complex conditions admitted to the BDMS center of excellence.

For BH, the rebound in the number of international patients, BH's main consumer, would result in a significant increase in income. During the Ramadan months, the BH management team noticed an increase in demand from middle eastern patients, which they regard to be a positive factor. After Thailand reopens fully, BH will focus more on this segment, while the number of patients with complex conditions has increased in the domestic market. These factors underpin the projection of a significant increase in BH's sales and net profit in 2022.

THG's situation is a little different, as revenue is predicted to rise in 2022 while net profit is expected to decline. This is due to the fact that THG still owes a loan plus interest and also the other financial burden. THG's revenue and net profit are likely to continue to decline after 2022, since revenue from COVID-related services, which generated a large amount of profit for THG in 2021, is expected to decline. Despite the fact that demand for non-COVID related medical services has returned in both Thailand and abroad, THG's unfavorable factors continue to outweigh its positive ones.



### 8.4.2 ROE and ROA

ROE for each firm have the same trend as their ROA. For BDMS, ROA and ROE tend to grow steadily which reflected the gradual improvement of profitability of the firm, while for BH, ROA and ROE are expected to spring back to pre-COVID level which is a benefit from the recovery in international patients that leads to the recover in BH’s profitability. On the other hand, THG profitability is also expected to return to the pre-COVID level but on the opposite way. Although THG benefit a lot from COVID related services during the pandemic, after Thailand reopen and everything goes back to normal, this benefit from this type of service would be lower and lower. Therefore, THG profitability drop back to normal. A huge increase in revenue and net profit of THG during COVID pandemic did not change an intrinsic profitability of the firm.

# 9. Discussion and Implication

An unbalanced care portfolio is dangerous in the hospital business. In this study, a hospital whose majority of revenue comes from international patients, such as BH, experienced a severe negative effect when the tourism industry encountered a crisis, which in this case was caused by the COVID pandemic. For BH, the situation was so bad that revenue has yet to recover to pre-COVID levels. Although BH tried to adapt by offering COVID-related services, the revenue from these services is still insufficient to compensate for the loss of international patients' earnings. This is the effect of an excessive dependence on a single customer group. On the other hand, if the crisis merely impacted domestic demand, BDMS would likely suffer a lot more than BH, because Thai patients account for more than 70% of BDMS revenue. As a result, hospitals should change their portfolios to be more balanced in order to reduce risk. For example, BH should prioritize the home market, but BDMS should prioritize the international market.

COVID pandemic may help chained hospitals like BDMS and THG more than a large stand-alone hospital like BH. Because people cannot travel freely under various limitations, such as curfew and lockdown, so when they needed medical help, they had to go to the nearest hospital. For this reason, Chained hospitals can provide medical services to more patients than a large stand-alone hospital since they span a larger area. As a result, a large stand-alone hospital such as BH should consider establishing some partner hospitals to reduce operating risk.

Small hospitals have a disadvantage in cost control over large hospitals not just because they have less negotiating power, but also because they have less credit and a less trustworthy reputation. THG, for example, cannot charge as much for the same services as BDMS or BH. Because BDMS and BH appear to be more premium and luxurious than THG, patients may be willing to pay more for BDMS and BH and less for THG, despite the fact that the treatments are the same and THG uses the same medical equipment as BDMS and BH. This indicates that THG has roughly the same cost as BDMS and BH for the same therapy, but THG cannot charge as much as them, hence THG has a lower profit margin than BDMS and BH. As a result, THG should increase service quality and customer relationship management in order to establish a more premium brand image, allowing it to charge a greater price for the same service.

During the crisis, cost and liquidity management are critical. For example, BH faced a significant loss of revenue from international patients, but it was still able to generate a

positive net profit because it had a low level of debt and strong cost control, so when revenue fell, costs fell as well. Furthermore, because BH had a large amount of cash, its insolvency risk is relatively low. Meanwhile, THG has a negative net profit since it has a debt burden and must pay interest. THG was unable to reduce costs as much as the revenue reduced, then resulting in a loss. Therefore, a firm must beware of excessive debt burden and also always set the appropriate level of cash so that when the crisis comes, a firm can continue operating for some time.

In a crisis, it is critical to make quick strategic decisions. THG was able to respond successfully to the COVID pandemic, as they developed numerous COVID-related services ahead of others, and these services earned a lot of profit, pushing overall income to more than 3.5 billion baht in Q3/2021, which was more than enough to compensate for a loss previously. There should always be an opportunity in each crisis, so a company's CEO should always look for it.

The advantage of an upside element does not boost a company's intrinsic capabilities unless it is invested properly. As we can see from the prediction section, even though THG received a significant amount of revenue from COVID-related services, its profitability would still return to pre-COVID levels once the situation returned to normal, because THG did not significantly invest those funds to improve the firm's profitability right away.

## 10. Suggestion

First of all, the discussion and implication recommended in section 9 is based on this research's findings during 2019 – 2021. Therefore, if we study the financial condition over a longer period of time, such as 10 years, the result and implications may be different.

Secondly, because the firms do not reveal some information publicly and some is not tracked thoroughly over time, part of the information used in the analysis in this study comes from the research institution rather than directly from the firms. The Kasikorn security research, for example, provided the prediction for the number of inpatients and outpatients in the next several years for each firm used in the prediction section. As a result, the accuracy of this study is also dependent on the accuracy of the secondary source of information. Furthermore, the approach used in the prediction section is a rudimentary method that can only be used for a tentative forecast. Therefore, more official information should be explored further in order to provide a more particular, correct, and full outcome. Similarly, more advanced prediction algorithms should be used in the further study.

# 11. Conclusion

The financial performance of BDMS, BH, and THG during the COVID pandemic in Thailand was analyzed in this study, and their results were compared. According to our findings, the pandemic had the most detrimental impact on THG's financial performance, as THG was the only company among the three to incur a negative net profit twice, in Q2/2020 and Q1/2021. BH was also hit hard by the pandemic, although it was able to retain a positive net profit during the period, whilst BDMS remained unaffected. Financial performance was discovered based on financial ratio analysis, operational statistics analysis, and financial forecast. The care portfolio and financial load are two significant areas that lead to distinct financial performances.

For example, BH lost a significant amount of revenue due to an imbalanced portfolio in which they relied on international patients more than Thai patients, but they did not experience a negative net profit because they have a low level of financial burden and carry a large amount of cash, whereas THG experienced a negative net profit despite not relying on international patients as much as BH. This was due to THG's debt burden and lack of negotiating strength with suppliers. In the meantime, BDMS lost the least in terms of revenue and net profit throughout this time since international patients did not account for the majority of their revenue at the first place. In addition, BDMS was also able to keep costs in control due to its ability to bargain with suppliers and low level of financial burden. Meanwhile, the money received from COVID-related services helped to ease the situation and strengthened total revenue recovery. Because of this, BDMS was able to weather the crisis more successfully than THG and BDMS, despite BDMS's modest profitability growth during the time.

As a result, we recommend hospitals to balance their care portfolios, avoid excessive debt, and constantly improve their cost management. Furthermore, we advised firms to always adapt in order to get good opportunities in any crisis, as THG did during the COVID outbreak and profited greatly.

Ultimately, no one wants a crisis to happen, but we must be prepared to the best of our abilities. By doing things as recommended, our firms would not be vulnerable. As a result, when the next crisis comes, our firm would survive.

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