Faculty of Economics and Business

Market Structure and Competitiveness of Malaysian Private Hospital Industry: A Structure, Conduct and Performance Analysis

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Market Structure and Competitiveness of Malaysian Private Hospital Industry: A Structure, Conduct and Performance Analysis

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DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The dissertation has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

The continuous increase in Malaysia's health-related Consumer Price Index (CPI) reflects rising healthcare expenses, potentially impacting families, and individuals reliant on ongoing medical care. This raises concerns about their ability to access quality healthcare without bearing excessive financial burdens. The primary aim of this research is to analyse the market structure (HHI) of the Malaysian private hospital industry between 2002 and 2021. This study has found that the HHI result shows a significant drastic transition from monopoly to monopolistic market structure, coinciding with the enactment of the Competition Act in 2010. Also, both time series and panel data methodologies are employed to investigate the influence of HHI on medical inflation, and the impact between the market structure, conduct, and performance of this industry, utilizing the Structure-Conduct-Performance (SCP) Paradigm from Industrial Organisation theory. The time series results suggested that medical inflation is influenced by fluctuations in market concentration (HHI). While, in the panel model, it is found that there exists a reciprocal relationship between market share and concentration, with mutual reinforcement observed between capital intensity and return on sales. However, it is noted that only return on assets directly impacts return on sales. These findings emphasise the importance for policymakers to encourage healthy competition among economic entities operating within the Malaysian private hospital sector.

Keywords: Structure-Conduct-Performance Paradigm, Private Hospital Industry, Competition

Struktur Pasaran dan Daya Saing Industri Hospital Swasta Malaysia: Struktur-Gelagat-Prestasi (SGP)

ABSTRAK

Kenaikan berterusan dalam Indeks Harga Pengguna (CPI) kesihatan di Malaysia menunjukkan peningkatan kos perkhidmatan kesihatan, yang mungkin memberi kesan kepada keluarga dan individu yang bergantung kepada perubatan secara berterusan. Ini menimbulkan kebimbangan terhadap kemampuan mereka untuk mengakses rawatan kesihatan yang berkualiti tanpa menanggung beban kewangan yang terlalu tinggi. Tujuan utama penyelidikan ini adalah untuk menganalisis struktur pasaran (HHI) industri hospital swasta Malaysia antara tahun 2002 hingga 2021. Kajian ini mendapati bahawa keputusan HHI menunjukkan peralihan drastik yang signifikan dari struktur pasaran monopoli kepada struktur pasaran yang bermonopoli, yang selaras dengan pelaksanaan Akta Persaingan pada tahun 2010. Selain itu, kedua-dua metodologi data siri masa dan panel digunakan untuk menyiasat impak HHI terhadap inflasi perubatan dan hubungan sebab-akibat dalam struktur pasaran, tingkah laku, dan prestasi industri ini, dengan menggunakan Paradigma Struktur-Gelagat-Prestasi (SGP) dari teori Organisasi Industri. Hasil data siri masa menunjukkan bahawa inflasi perubatan dipengaruhi oleh fluktuasi dalam kepekatan pasaran (HHI). Sementara itu, melalui model panel, didapati bahawa terdapat hubungan berbalas-balik antara bahagian pasaran dan kepekatan, dengan penguatan bersama yang diperhatikan antara intensiti modal dan pulangan jualan. Walau bagaimanapun, diperhatikan bahawa hanya pulangan atas aset yang memberi impak langsung kepada pulangan jualan. Temuan ini menekankan kepentingan untuk pihak berwajib menggalakkan persaingan sihat di kalangan entiti ekonomi yang beroperasi dalam sektor hospital swasta Malaysia.

Kata Kunci: *Paradigma Struktur-Gelagat-Prestasi, Industri Hospital Swasta, Persaingan*

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LIST OF ABBREVIATIONS

2SLS	Two-Stage Least Squares
3SLS	Three-Stage Least Squares
AD	Advertising Intensity
ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ASA	American Statistical Association
BHF	Board Of Healthcare Funders
BIC	Bayesian Information Criterion
CAP	Capital Intensity
CGM	Continuous Glucose Monitoring
CPI	Consumer Price Index
CR5	Concentration Ratio 5
CRN	Concentration Ratio
DEA	Data Envelopment Analysis
DOJ	Department Of Justice
ES	Efficient Structure

ETRS	Effective Tax Rates
FE	Fixed Effect Model
FTC	Federal Trade Commission
GLS	Generalized Least Squares
GMM	Generalized Approach of Moment
HASA	Hospital Association of South Africa
HHI	Herfindahl-Hirschman Index
HT	Healthcare Traveller
IO	Industrial Organisation
ISUMP	Index Sales Unit Market Performance
K1M	Klinik 1 Malaysia
KKOM	Communications and Multimedia Ministry
LI	Lerner Index
LSDV	Least Squares Dummy Variables
MES	Minimum Efficient Scale
MFRS	Malaysian Financial Reporting Standards
MMC	Malaysian Medical Council

MOH	Ministry Of Health
MPSAS	Malaysian Public Sector Accounting Standards
MS	Market Share
MYCC	Malaysia Competition Commission
NCD	Non-Communicable Diseases
NEIO	New Empirical Economic Organisation
NIM	Net Interest Margin
OLS	Ordinary Least Squares
OOP	Out Of Pocket
PBIT	Profit Before Interest and Taxes
PCM	Price Cost Margin
PHFSA	Private Healthcare Facilities and Services Act
PLS	Panel Least Square
POLS	Pooled Ordinary Least Squares
PPP	Public-Private Partnerships
PR	Panzar-Rosse Model
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses

RE	Random Effect Model
RMP	Relative Market Power
ROA	Return On Assets
ROE	Return On Equity
ROS	Return On Sales
SAMA	South African Medical Association
SCP PARADIGM	Structure Conduct Performance Paradigm
SDG 10	Sustainable Development Goal 10
SDG 8	Sustainable Development Goal 8
SDG	Sustainable Development Goals
SELL	Selling Intensity
SFA	Stochastic Frontier Analysis
SHARE	Market Share
SJMC	Subang Jaya Medical Centre
SLR	Systematic Literature Review
SMES	Small And Medium – Sized Enterprises
SS	Systemic Sclerosis

VAR	Vector Autoregression
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

1.1 Study Background

Malaysia's healthcare system has earned international acclaim, being recognised as the "Best Country in the World for Healthcare" and securing the fifth spot globally as the best place to retire in 2019. To sustain this status, the government increased the Health Ministry's budget to RM36.14 billion in 2023 (Ministry of Health Malaysia, 2022).

However, the public healthcare sector faces a significant challenge: a shortage of doctors and specialists, attributed to factors like heavy workloads, long hours, low salaries, unattractive working conditions, and preferences for urban areas. This shortage leads to prolonged waiting times for patients seeking treatment and medication (Zainuddin, 2023; Parkaran, 2023; Reporters, 2023).

In contrast, private hospitals excel in perceived service quality, with patients reporting higher satisfaction levels. This is attributed to factors such as staff friendliness, cleanliness, and quality amenities. Malaysia's healthcare system operates on a two-tier structure, with the government funding the public sector and the private sector catering to those who can afford healthcare services. The private sector has seen increased demand due to higher disposable incomes, growing health awareness, and rising healthcare costs (Zhu et al., 2014).

Private hospitals, offering superior facilities and medical professionals, are preferred by those seeking high-quality services. However, public hospitals remain more affordable, making them the choice for patients with limited financial means (Ahmed et al., 2017;

Baharin et al., 2022). The financial burden on patients in both sectors is significant, with a survey indicating that only 11.9% use personal health insurance, leading to an increase in out-of-pocket expenditures (National Institutes of Health, 2019). Rising healthcare costs in Malaysia are linked to an ageing population, increased demand for services, health risk factors, and expenses related to technological advances (Singh & Kumar, 2016). Despite these challenges, technological advancements have significantly impacted life expectancy, increasing from 73 years in 2000 to 76 years in 2019.

Various studies have explored aspects of the Malaysian healthcare system, including lean healthcare practices, institutional frameworks, healthcare expenditure, and the roles of the government and private sector (Habidin et al., 2016; Yorulmaz & Mohamed, 2019; Ashraf & Ong, 2021; Sulaiman & Wickramasinghe, 2014). In Europe, research on competition among private hospitals has revealed their varying policies across European countries and potential trade-offs, such as improved efficiency in public hospitals and healthier patients choosing private surgical centres (Siciliani et al., 2017; Chua et al., 2011; Noether, 1988; Cooper et al., 2018).

The market structure of KPJ Healthcare, a leading private specialist healthcare provider, is emphasised in its annual report. Strategic positioning, core competencies, and a commitment to quality care distinguish KPJ Healthcare in the competitive market (KPJ Healthcare Annual Report, 2002). KPJ's business conduct and pricing strategies align with market position and customer segmentation, as suggested by Bourdon (1992), Mills and Monk (2002), and Kimand Parker (1999). The company's focus on customer care excellence and staff performance contributes to its strong business performance (Ahmetoglu et al., 2014).

In analysing the competition structure of the Malaysian private hospital industry, Past studies have employed the Structure-Conduct-Performance (SCP) paradigm. In the past, the market structure was highly concentrated, with a few dominant players controlling a significant market share. However, with the implementation of the Competition Act 2010, there has been a shift towards a more competitive market structure.

Several studies have explored the impact of market structure on the industry's competitiveness. One study found that a more concentrated market structure is associated with higher prices and lower quality of care, while another found that a more competitive market structure is linked to higher efficiency and profitability of firms.

The Malaysia Competition Act 2010, which became effective on January 1, 2012, was administered by the Malaysia Competition Commission (MyCC). The act aims to promote economic development by safeguarding the process of competition, ultimately protecting consumers' interests. It addresses horizontal and vertical anti-competitive agreements and prevents abuse of a dominant position, and it applies to all commercial activities within and outside Malaysia, affecting competition in any Malaysian market. The act is instrumental in promoting access to medicines and addressing abuse of patents and intellectual property rights.

The Malaysian Competition Commission (MyCC) plays a crucial role in enforcing competition law, striving to promote and sustain healthy competition in the market, protecting consumers' interests, and enhancing economic efficiency and innovation. MyCC investigates and addresses anti-competitive practices, assesses mergers and acquisitions, creates awareness about competition law, and provides guidance and education to market players and the public. Meanwhile, the Ministry of Health (MOH) in Malaysia is central to

administering public sector health services, overseeing various healthcare facilities, and collaborating with other government departments to provide healthcare services to specific populations. The MOH ensures the accessibility and quality of healthcare services for the Malaysian population.

Ensuring healthy competition among hospitals in Malaysia involves the oversight and regulation of the healthcare industry by various government agencies and regulatory bodies. Relevant agencies and organisations in this matter include the Ministry of Health (MOH), the Malaysian Competition Commission (MyCC), the Private Healthcare Facilities and Services Act (PHFSA), the Malaysian Medical Council (MMC), and healthcare professional bodies. Together, they create an environment where hospitals compete based on the quality and efficiency of healthcare services, ultimately leading to improved access to affordable and high-quality healthcare for the population.

Begum (2018) stated that structure analysis involves examining and evaluating the characteristics and components of a market or industry. This includes studying the organisation, composition, and arrangement of market participants, as well as various factors that influence market behaviour. Structure analysis specifically refers to the assessment of market structure in terms of buyer and seller concentration, market transparency, and barriers to entry. This analysis helps in understanding how market conditions and the arrangement of market participants impact market conduct and performance.

Eronmwon et al. (2014) defined conduct analysis as the evaluation of the behaviours and practices of firms or individuals within a specific industry or market. It focuses on understanding the strategies, policies, and actions pursued by sellers or market participants. This document specifically examines the behaviour and practices of plantain marketers in

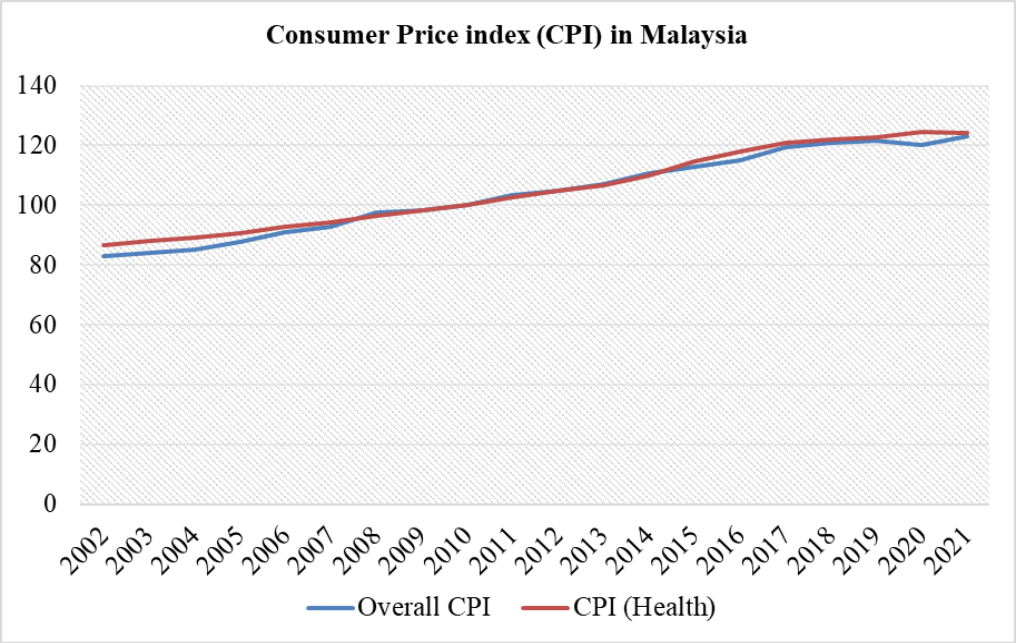
Edo State, Nigeria, including factors that determine prices, market associations, and marketing strategies used by the marketers. Conduct analysis helps to assess market performance and understand the dynamics of competition within a market.

Lubis et al. (2022) explained that performance analysis refers to the process of assessing and evaluating the outcomes and effectiveness of a company or industry based on various parameters and metrics. It involves measuring the results achieved by an industry or company, which can include factors such as profits, added value, efficiency, growth, employment, professional prestige, personnel welfare, and group pride. Performance analysis helps in understanding the impact of market structure and behaviour on the performance of the industry or company. One of the methods used to measure performance is the Price Cost Margin (PCM), which calculates the ratio of profit to total income.

Overall, performance analysis provides insights into the overall success and performance of the industry or company based on its structure and behaviour. Understanding these market dynamics and their implications iscrucial for assessing competition, market structure, and regulatory influences in the private hospital industry.

1.2 Problem Statement

The demand for healthcare in Malaysia has been rising rapidly over the years, mainly caused by increasing ageing populations and lifestyle changes that raise chronic disease rates and technological advancement (Singh & Kumar, 2016). Thus, the national healthcare system is pressured to provide quality and effective services to the population. Some issues in healthcare include increasing healthcare costs, enhancing the capacity and efficiency of the healthcare system, and the need to promote health awareness and disease prevention.



Source: https://open.dosm.gov.my/dashboard/consumer-prices

Figure 1. 1: Consumer Price Index (CPI) in Malaysia

According to the Department of Statistics Malaysia (2022), the health-related Consumer Price Index (CPI) in Malaysia has shown a continuous increase from 2002 to 2021, with 2000 as the based year for 2002 to 2009 and 2010 as the based year 2010 for 2011 to 2021. This growth is likely influenced by factors such as inflation, escalating treatment expenses, and growing demand for healthcare services. Furthermore, a similar upward trajectory is evident in the overall Consumer Price Index (CPI) for the same year, indicating a parallel escalation in general consumer prices.

This figure indicates that the rising cost of healthcare services and related expenses has posed significant implications for consumers, particularly those who rely heavily on healthcare, such as individuals with chronic conditions, older adults, and low-income households. The rise in medical costs in the healthcare market is associated with the level of competition, according to multiple studies on the SCP paradigm. Erasmus (2016) and Berden

(2019) emphasised that highly concentrated markets empower dominant private hospitals with increased pricing power, leading to higher medical costs due to limited alternatives and reduced competition. Medical inflation influences consumer behaviour, prompting patients to seek more affordable healthcare options and impacting the market conduct of private healthcare providers (Erasmus, 2016).

The World Bank highlighted the substantial impact of Non-Communicable Diseases (NCDs), particularly diabetes, on healthcare costs in Malaysia, amounting to RM4.38 billion in 2017. With a rising ageing population in Malaysia, the demand for treatments related to NCDs is expected to rise. To gain market share, healthcare providers are enhancing their quality of care through investments in new technologies, such as biodegradable cardiac stents and continuous glucose monitoring devices for diabetes (Singh & Kumar, 2016; Ministry of Health Malaysia, 2020). However, dominant firms with superior financing capabilities may leave smaller private hospitals lagging in technological advancement (Zelder, 2021).

The rise in medical costs, influenced by market structure and power, holds significant implications for the healthcare system, consumers, and the economy (Chong & Chan, 2014). The SCP paradigm study in the pharmaceutical industry concludes that market structure impacts pricing behaviour, resulting in higher prices for pharmaceutical products. Moreover, as a market becomes more concentrated, dominant firms' market power will affect pricing behaviour that allows them to charge higher prices in response to changing market dynamics (Berden, 2019).

Shifting focus to Sustainable Development Goals (SDGs), SDG 3 aims at ensuring healthy lives and promoting well-being for all at all ages. The exploration of escalating

medical costs directly corresponds to SDG 3, requiring substantial investments in health systems to expand service provision (Stenberg, 2017). However, a lack of academic support for the economic aspects of SDG 3 was noted, including investment (Makarenko, 2021). Technological innovation contributes to rising costs, and it is a key driver of health expenditure growth (Bodenheimer, 2005). The theory of change for improving health systems performance, a key component of SDG 3, is also a crucial consideration (Seidman, 2017).

Furthermore, research consistently shows a direct correlation between medical costs and Sustainable Development Goal 8 (SDG 8), aiming to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. Morrisroe (2017) found that the direct healthcare cost of systemic sclerosis (SSc) in Australia was substantial, with hospital costs accounting for the majority.

The direct medical costs of various health conditions, including coronary artery disease (Russell, 1998), COVID-19 (Anonymous, 2020), systemic lupus erythematosus (Park, 2015), and type 2 diabetes (Ng, 2015), have been found to be substantial. These costs can create a significant economic burden on individuals and healthcare systems, particularly for those with lower socioeconomic status. Addressing these costs is crucial for achieving Sustainable Development Goal 10 (SDG 10), which aims to reduce inequalities within and among countries.

Technological investment in hospitals plays a significant role in patient care and hospital performance (Li & Rubin, 2004). This investment can be influenced by purchasing rules and long-term contracts set by the purchaser (Levaggi & Moretto, 2008). Public-Private Partnerships (PPPs) can play a crucial role in ensuring the sustainability of these investments,

particularly in the context of smart hospitals (Visconti et al., 2019). These partnerships can help reduce the waste of public money and improve the efficiency and quality of care, ultimately contributing to the achievement of Sustainable Development Goal 3.

The relationship between hospital technological investment and SDG 8, which focuses on decent work and economic growth, is complex and multifaceted. Li (2004) found that technology investment is related to hospital size and the number of services offered, suggesting a potential impact on job creation and economic growth. Wetering (2018) further explored this, suggesting that investment in IT infrastructure can enhance a hospital's digital capabilities, potentially leading to improved operational excellence and economic performance.

Similarly, a complex and multifaceted relationship was also found between hospital technological investment and SDG 10, which aims to reduce inequalities. Inequalities can also be affected by hospital size and the number of services offered, suggesting that larger hospitals with more services can address inequalities better. Visconti (2019) further explored this, highlighting the potential of public-private partnerships in smart hospitals to improve health sustainability and quality of care, which could contribute to reducing inequalities. Wyllie (2022) emphasised the role of eHealth services in increasing the capacity of care, a key aspect of SDG 3. This is further supported by Folland (1990), who discussed the impact of Medicare payment regulations on hospital market values, and Chilingerian (1992), who highlighted the emerging market segment of buyers seeking high-quality, efficient care.

Zahid (2021) and Clark (2018) emphasised the role of emerging information technologies, such as data modelling and analytics, and the use of digital identification for efficient healthcare delivery, respectively. These factors collectively contribute to the

potential market in hospitals, aligning with SDG 8's goal of promoting economic growth and decent work for all. The relationship between hospital market structure and efficiency is a key consideration in the context of Sustainable Development Goal 10, which aims to reduce inequality within and among countries. Robinson (1989) and Dalmau (1997) both highlighted the potential impact of market competition on hospital efficiency, with the former emphasising the role of competition in driving efficiency and the latter finding a positive relationship between the number of competitors and technical efficiency.

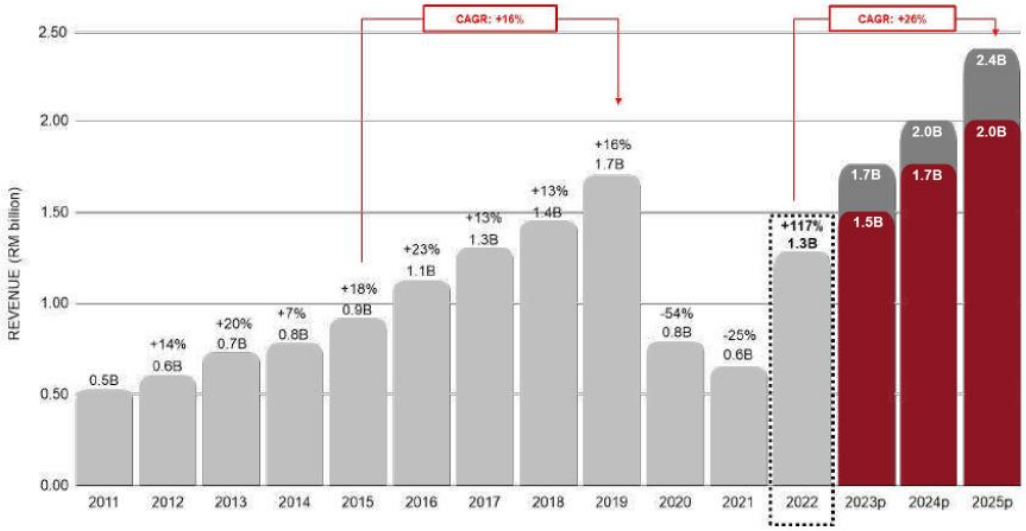
The growth of medical tourism has been fuelled by various factors, including the changing distribution of medical services and technologies, the packaging of tourism and medical services as a single product, and the availability of the internet to disseminate information (Eades, 2015). This trend has been particularly pronounced in the developing world, where countries are increasingly courting medical tourists (MacReady, 2007). However, the rise of medical tourism also raises concerns about the privatisation of healthcare, uneven access to health resources, and the globalisation of both healthcare and tourism (Connell, 2006). Despite these challenges, medical tourism is a rapidly growing sector, with its rising popularity and the economic importance of obtaining high-tech medical services outside one's region on the rise (Veselova, 2017).

A range of studies have highlighted the issue of overcharging in the medical insurance industry. Sun et al. (2019) found that out-of-network billing is common, leading to significant financial strain for patients. Woodworth et al. (2017) and White et al. (2013) both identified higher charges for privately insured patients, with the latter also noting significant price variation within and across markets. Pan et al. (2009) further emphasised the role of hospitals in overpricing insured patients, particularly for specific conditions.

These findings collectively underscore the need for better regulation and oversight in the medical insurance and healthcare sectors.

The supply of medical drugs more expensive than market prices can be attributed to various factors. Shahriar and Alpern (2020) highlighted the role of barriers to generic entry, while Hulme et al. (2020) discuss the high mark-ups in the black-market pharmaceutical supply. The introduction of new, more efficient medicines also contributes to the rising costs of pharmaceuticals (Werkö, 2004). Additionally, Kesselheim et al. (2014) pointed out that legal market monopolies could lead to significant price increases for generic drugs. These factors collectively contribute to the high prices of medical drugs, making them unaffordable for most patients.

Generic drugs, which are bioequivalent to their patented counterparts, are often prescribed to reduce costs (Thakkar & Billa, 2013). However, cost savings may only sometimes be significant, especially for newer drugs (Blier, 2003). Despite the potential for cost savings, concerns about the efficacy and safety of generic drugs have yet to be raised (Mb, 1989). The introduction of biosimilars, a type of off-patent drug, has further complicated the comparison between generic and patented drugs (Van De Vooren et al., 2015).



Source: Malaysia Healthcare Travel CouncilNote: Data from HIC as of February 2022

Figure 1.2: Healthcare Traveller Revenue for Year 2022

The demand side refers to the approach where individuals have the power to choose and consume healthcare services from private healthcare providers (Ecks, 2021). On the supply side, in the context of private hospitals, it is mentioned that Malaysia's healthcare travel industry achieved over a 100 per cent increase in Healthcare Traveller (HT) revenue in 2022 compared to the previous year, surpassing RM1.3 billion. The industry demonstrated an encouraging recovery rate, surpassing both the global and Asia-Pacific tourism recovery rates of 63 per cent and 23 per cent, respectively.

Table 1.1: Health Facilities by Type, Number of Bed Complement and BOR in MOH, 2017 to 2022.

No.	Facility	2017	2018	2019	2020	2021	2022
1.	Number of Hospital	**144**	**144**	**144**	**146**	**146**	**148**
	i. - Hospital	135	135	135	135	135	137
	ii. - Special Medical Institution	9	9	9	11	11	11
2.	Number of Bed Complement[1]	**42,302**	**42,434**	**42,936**	**44,117**	**44,849**	**45,167**
	i. - Hospital	37,470	37,619	38,131	38,543	39,263	39,581
	ii. - Special Medical Institution	4,832	4,815	4,805	5,574	5,586	5,586
3.	Bed Occupancy Rate, BOR (%)[1]	**60.75**	**68.75**	**70.01**	**64.72**	**77.52**	**69.01**
4.	Number of Health Clinics	**994**	**1,000**	**1,027**	**1,051**	**1,057**	**1,077**
5.	Number of Rural Clinics	**1,798**	**1,791**	**1,771**	**1,752**	**1,749**	**1,722**
6.	Number of Maternal and Child Health Clinics	**91**	**90**	**87**	**87**	**86**	**83**
7.	Number of 1Malaysia Clinic/ Community Clinics[2]	**342**	**343**	**286**	**257**	**255**	**239**

Notes: 1. 1 Refers to the number of bed complements and BOR in MOH Hospitals and Special Medical Institutions 2. 2 From 1 January 2019, 1Malaysia Clinic (K1M) was renamed to Community Clinic (KKom)

Source: Health Informatics Centre, MOH

The number of hospitals and bed complements for MOH hospitals and Special Medical Institutions increased from 144 in 2017 to 148 in 2022, while the number of bed complements in MOH Hospitals and Special Medical Institutions increased from 42,302 in 2017 to 45,167 in 2022 (See Table 1.1). These figures provide an overview of the healthcare infrastructure in Malaysia, but they do not specifically focus on the private hospital industry.

Pallegedara and Grimm (2017) mentioned valuable insights into the demand and supply side factors influencing the private hospital industry in Sri Lanka. On the demand side, the study highlights that easy access to private, private-sector health facilities increases

the use of private-sector outpatient care, with the proximity to the nearest private-sector facility positively impacting usage. Additionally, richer individuals tend to use private-sector healthcare services rather than public services, indicating a link between income and the choice of healthcare provider.

The literature gap in this study encompasses several critical aspects of the private hospital industry in developing countries. Firstly, a notable lack of attention given to the private hospital industry in developing nations was noted, primarily due to a prevailing focus on public healthcare systems. This bias results from limited data availability concerning private providers, industry fragmentation, and a need for more regulatory oversight. While public healthcare systems receive more resources and attention, private hospitals need help in transparency, hindering comprehensive research and comparisons with public healthcare systems. This hampers efforts to address crucial issues of quality, safety, and efficiency in private healthcare provision.

Furthermore, the gap extends to the exploration of healthcare policy and regulations that foster healthy competition among private hospitals. Effective policies should ensure transparency in pricing and service quality, enforce anti-trust laws to prevent monopolistic practices, establish accreditation standards for maintaining quality care, and provide incentives for innovation and efficiency. Also, creating a competitive environment through regulatory frameworks can encourage private hospitals to enhance service delivery, improve patient outcomes, and reduce costs, ultimately benefiting healthcare consumers and the overall healthcare system.

Additionally, the research gap explored the strategies employed by firms at different levels of market concentration. This analysis entails understanding how companies adjust

their business tactics based on the competitive landscape. In highly concentrated markets, strategies may focus on maintaining market power through pricing strategies, product differentiation, and barriers to entry. Conversely, in less concentrated markets with more competitors, firms may emphasise innovation, cost efficiency, and customer service to gain a competitive edge. Understanding these strategies at varying levels of market concentration is crucial for assessing market dynamics, competition intensity, and the overall performance of firms within the industry.

Another dimension of the literature gap relates to how different market structures impact the effectiveness of competition and incentives in healthcare. Various market structures, such as monopolistic, competitive, and oligopolistic, can influence competition and incentives differently. Thus, policymakers need a fundamental understanding to design effective regulations ensuring both quality and affordability in healthcare services.

Moreover, the gap extends to the impact of policies towards hospitals' structure, conduct, and performance. Policies that promote competition and prevent monopolies can enhance efficiency, innovation, and quality of care. On the other hand, policies that restrict competition or impose excessive regulations can stifle innovation, reduce quality, and increase costs. Policymakers must carefully consider the impact of policies on hospitals' structure, conduct, and performance to ensure they promote a competitive environment while maintaining quality and affordability in healthcare services.

1.3 Research Questions

The following research questions have been identified as follows:

1. What are the current market structure and the level of competition in the Malaysian

private hospital industry?

2. How has the market structure in Malaysia influenced the trend of medical inflation?
3. How do the Structure, Conduct, and Performance relate to each other in the context of the private hospital industry in Malaysia?

1.4 Research Objectives

In this research, two types of relevant objectives stand out: general objectives and specific objectives. General objectives encompass broader areas of interest, while specific objectives delve into more detailed elements that form the central focus of analysis within this research framework.

1.4.1 General Objective

The main objective of this study is to comprehensively analyse the market structure of the private hospital industry in Malaysia and investigate its implications on medical inflation. The present study also aims to investigate the causal relationships that exist within and between the market structure, conduct, and performance of the private hospital industry in Malaysia.

1.4.2 Specific Objectives

The specific objective of this study is as follows:

1. To determine the market structure and the level of competition in Malaysia's private hospital industry using the Herfindahl-Hirschman Index (HHI).
2. To investigate the impact of market structure on medical inflation in Malaysia in time series Analysis.

3. To investigate the impact of market structure, conduct, and performance in the private hospital industry in Malaysia.

1.5 Significance of the Study

This research holds significant promise, aiming to deliver various advantages through its specific objectives. The overarching goal is to draw comprehensive conclusions regarding the current market structure and competition levels within Malaysia's private hospital industry. Understanding the intricate relationship between market structure, conduct, and performance is crucial, particularly in medical inflation, a concern tied to the competitive landscape influencing the behaviour and performance of industry players.

To begin, the study conducted a thorough examination of the private hospital market structure to gauge the competition levels. This exploration is anticipated to yield insights into the sources of medical inflation over time by assessing market competition alongside other contributing factors.

Furthermore, the research delved deeper into the connection between the market concentration of private hospitals and medical inflation in Malaysia against the backdrop of a persistent increase in medical inflation over the past two decades. The study investigated whether a significant relationship exists between market concentration and the upward trend of medical inflation. The aim is to unravel how the structure of the private hospital market influences healthcare service pricing and affordability, providing valuable insights into the impact of market concentration on accessibility and costs for the Malaysian population.

In response to the issue of medical inflation, the study explored the causal relationship between Structure, Conduct, and Performance. By gaining insight into the

industry players' behaviour influenced by market competition, the research aims to provide a basis for decision-making among policymakers, private hospitals, and patients. The focus is on promoting competition, ensuring access to affordable and high-quality healthcare services, and enhancing overall healthcare system performance.

For the Malaysian government, understanding the market structure and factors influencing hospital industry performance may aid in crafting regulations that promote fair competition and prevent monopolisation. Having a firm understanding could lead to increased competition, making healthcare more affordable for the country.

Likewise, for players in the private hospital industry, the study may offer insights into factors influencing business performance, helping them formulate competitive business strategies. Ultimately, the study indirectly benefits patients by fostering healthy competition among hospital industry players that will provide more choices for affordable and quality healthcare in Malaysia. The narrative of the research's significance unfolds through its contributions, practical implications, economic insights, and policy recommendations, collectively aimed at advancing the private hospital industry in Malaysia for the benefit of the community and the country.

1.6 Organisation of the Study

This research comprises several chapters highlighting the market structure and competition in the private hospital industry. First, chapter 1 elaborates on the background of the study, problem statement, research question, and research objective. This chapter examines the causes of medical inflation and how medical inflation impacts the structure, conduct, and performance of the private hospital industry.

Next, the second chapter aims to study the development of the SCP paradigm through a Systematic Literature Review and Bibliometric analysis. The SCP paradigm was utilised to measure competitiveness in the private hospital industry and to identify the relationship between the structure, conduct, and performance of private hospitals in Malaysia. A systematic literature review and bibliometric analysis were employed to conduct an in-depth analysis of the SCP Paradigm. Chapter 2 focuses on the underpinning theory of the SCP paradigm, and in-depth research on past studies was further conducted under the section on empirical review, which would be used to guide the development of the research framework.

Also, an analysis of the literature gap of past studies would assist in addressing the research question and objective of the study. Finally, the chapter summary highlights significant findings in the context of the SCP paradigm from the literature review and addresses any gaps in conducting the research. Moving on, the third chapter covers the empirical examination of market structure and competitiveness through the Structure-Conduct-Performance (SCP) paradigm by investigating the multidirectional relationship between three elements in the SCP paradigm using secondary data sources such as the firm's financial data. The study was limited to Malaysian private hospitals in both East and West Malaysia that offer services for inpatients and outpatients.

Following the methodology section in Chapter 3, which covers all the resources needed to derive the findings of the study, Chapter 4 examines market concentration and the Herfindahl-Hirschman Index (HHI) of the private hospital industry in Malaysia. In addition, a descriptive analysis would be conducted to evaluate key indicators of market structure and competition. Next, a unit root test for determining the stationary or non-stationary nature of time series variables, cointegration to explore long-term relationships among non-stationary

variables, and the potent Vector Autoregression (VAR) model for dynamic analysis across multiple time series variables would be conducted. To ensure the reliability of the findings, several specification test models were employed to test the robustness of the results. Moreover, in this study, the Granger Causality Test was applied to examine the causal relationship between the market structure, conduct, and performance of the private hospital industry in Malaysia.

In conclusion, Chapter 5 of this study provides a comprehensive summary of the research findings, focusing on the implications of the study, its limitations, and recommendations for future research. Several limitations of the study were addressed, including data availability, sample size and representativeness, methodological considerations, assumptions and simplifications, data interpretation, and limited industry information. The findings of this study will be valuable for policymakers, private hospitals, and patients, as they can inform decision-making processes related to promoting competition, ensuring access to affordable and high-quality healthcare services, and enhancing the overall performance of the healthcare system.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview

This chapter reviews related literature on the SCP Paradigm in various industries to better understand how the framework can be utilised to examine the structure, conduct, and performance of firms in various industries by mapping the development of SCP paradigm literature. An emphasis on the scope, measurement, and influence in assessing the market structure and competitiveness of the Malaysian private hospital industry was put to shed light on the SCP Paradigm. Two prevalent research methods, namely the Systematic Literature Review (SLR) and bibliometric analysis, were undertaken to derive maximum benefit from each approach. The SLR offers a robust and dependable method for selecting appropriate contributions in a broad research field, while bibliometric analysis allows for dynamic analysis of the journals and papers that have made significant contributions to the theory-building in the sectors.

The study used a database search that followed one of the most well-known systematic review methods to create a comprehensive map of the knowledge structure in the subject of the Structure, Conduct, and Performance Paradigm. Asif and Akhter (2019) explained that Systematic Literature Review (SLR) is a highly effective analytical review methodology in adequately analysing earlier empirical works, and scholars carry out this method through several unique and repeatable processes to improve overall review quality. Tranfield et al. (2003) claimed that, unlike traditional unstructured reviews, SLR adopts a scientific and open process to reduce bias and inaccuracy. However, it should be used in conjunction with traditional literature review methods rather than as a replacement (Li & Wang, 2018).

The PRISMA procedure has certain clear advantages, such as a precise, rigorous, and well-described checklist that assists academics and researchers in improving the way they do bibliometric analysis, systematic review reporting, and meta-analysis. The first version of this protocol was published in 2009 as a reporting guideline intended to promote transparency and amore rigorous approach to creating systematic reviews and meta-analyses to help readers understand why the review was conducted. Furthermore, Zupic and Čater (2015) explained that bibliometric approaches are used to improve the contribution of the SLR by providing an objective review of scientific literature, enhancing rigor, and reducing researcher bias.

Therefore, the bibliometric analysis is discussed in Section 2.2, and SLR is discussed in Section 2.5. Both methods are used as effective approaches for producing a justifiable synthesis of the information related to the variables in this study. As a result, the combined results of these analyses would provide a thorough understanding of the application of the SCP paradigm and provide a concise overview of the existing knowledge related to the SCP paradigm. The review primarily focused on empirical papers and distilled the key findings presented in various research papers. Moreover, this review can shed light on future research directions.

The results from the Systematic Literature Review (SLR) would provide insights into existing research within the field and the arguments presented. Section 2.6 focuses on the Underpinning Theory of Industrial Organisation. Section 2.7 delves into the Underpinning Regulatory Theory on Public Policy and Antitrust. Section 2.8 explores the Underpinning of Game Theory, and Section 2.9 discusses the Underpinning of Market Structure Theory on Contestable Markets. These theories play a significant role in analysing firms' structure,

conduct, and performance. Additionally, Section 2.6.1 reviews empirical studies related to the Structure-Conduct-Performance (SCP) Paradigm, examining its development, the relationship between market structure and competition, and the elements of the SCP Paradigm:Structure, Conduct, and Performance within the context of the Private Hospital Industry in Malaysia. Finally, Section 2.14 addresses the literature gap by identifying areas in past studies that warrant further research.

A series of studies have explored various aspects of private hospitals in Malaysia. Shukri (2015) and Ramli (2015) both focused on the performance of these hospitals, with Shukri (2015) finding a link between centralised organisational structure and improved performance and Ramli (2015) identifying and ranking specific performance measures. Mok and Leong (2021) delved into the factors affecting the effectiveness of employees' performance appraisal, highlighting the importance of the performance appraisal process and perceived fairness. Lastly, Ogunmokun (2005) examined the implementation of marketing strategies in private hospitals and their impact on organisational performance. These studies collectively shed light on different facets of private hospitals in Malaysia, but there is still a need for more comprehensive research on their market structure, conduct, and performance.

2.2 Bibliometric Analysis

Bibliometrics is a quantitative analysis that allows the researcher to assess the nature and scope of a particular field of study and discover different trends in collaboration networks (J. Liu et al., 2020). This analysis summarises a large amount of scientific data to characterise and identify the status of the intellectual structure and develop trends of a particular research topic (Donthu et al., 2021). Additionally, Paul and Criado (2020) explained that the researcher may categorise the literature, examine the gaps in previous

studies, and provide recommendations for future research.

The bibliometric discipline has become prominent among business and economic researchers (Zhong & Lin, 2022; Donthu et al., 2021). The structure conduct and performance paradigm's study can be explored using this approach based on statistical analysis. Databases were collected from Scopus and the Web of Science. The keyword for the search was limited to articles that contain the keywords "SCP PARADIGM" OR "STRUCTURE CONDUCT AND PERFORMANCE PARADIGM" AND "INDUS*" in the title, abstract, and keywords. The term Indus* was used to obtain articles with titles containing words related to the industry. Furthermore, as stated in Table 2.2, inclusion criteria were used, resulting in 131 articles, of which 30 were found to be duplicates, which were then excluded from the analysis.

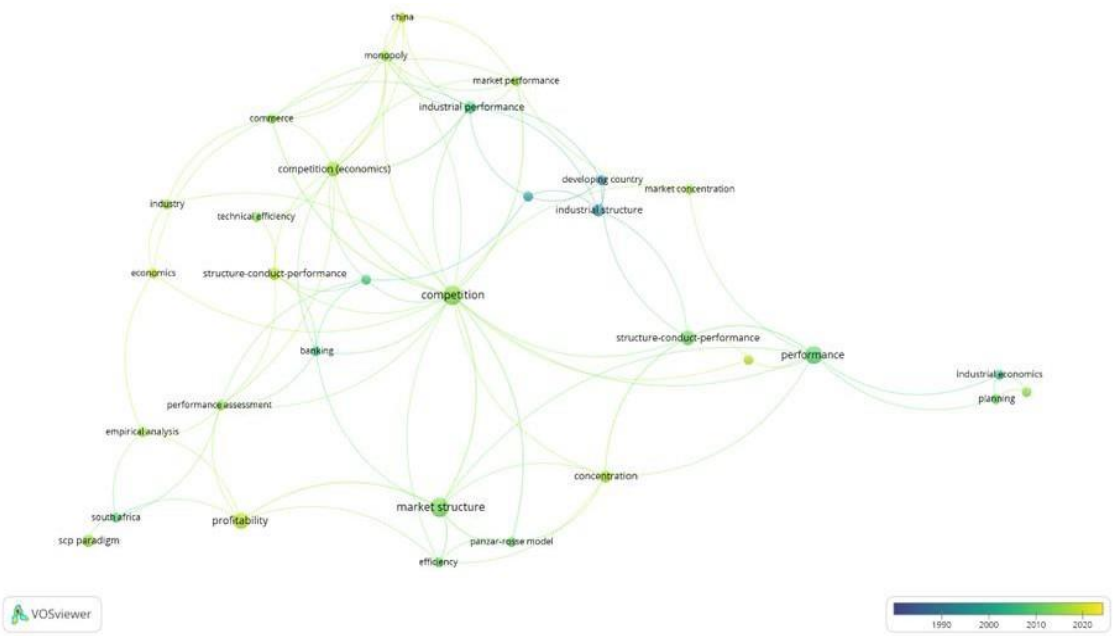


Figure 2.1: Trending Topic

Based on a bibliometric analysis using VOS Viewer in Figure 2.1, it shows that the trending topic still includes keywords such as competition, market performance, monopoly, commerce, technical efficiency, performance assessment, market structure, efficiency, Panzar-Rosse model, competition, industry, economics, and commerce. These concepts are highly relevant and frequently discussed in the literature on the SCP Paradigm and industries.

The prominence of these keywords signifies their importance in understanding and evaluating market concentration, firm performance, profitability, and competitive dynamics within various industries. The SCP Paradigm explores the relationship between market structure, conduct, and performance and how these factors affect the behaviour and outcomes of firms in different sectors. Competition, market performance, and market structure are fundamental concepts in this framework. Then, the inclusion of keywords related to economics, commerce, and industry further reinforces the relevance of these topics in the analysis of the SCP paradigm and industries.

Technical efficiency and performance assessment are also critical considerations when evaluating market concentration and firm performance. The Panzar-Rosse model, which is referenced as a widely used keyword, is a method used to assess the competitive behaviour and market power of firms. It measures the degree to which firms possess market power by analysing their pricing behaviour.

In summary, the persistence of these trending keywords in Figure 2.1 reflects their ongoing importance and relevance in the study of the SCP Paradigm and industries. These keywords encapsulate key factors that influence competition, market performance, market structure, efficiency, and overall industry dynamics.

2.3 Publication Trends

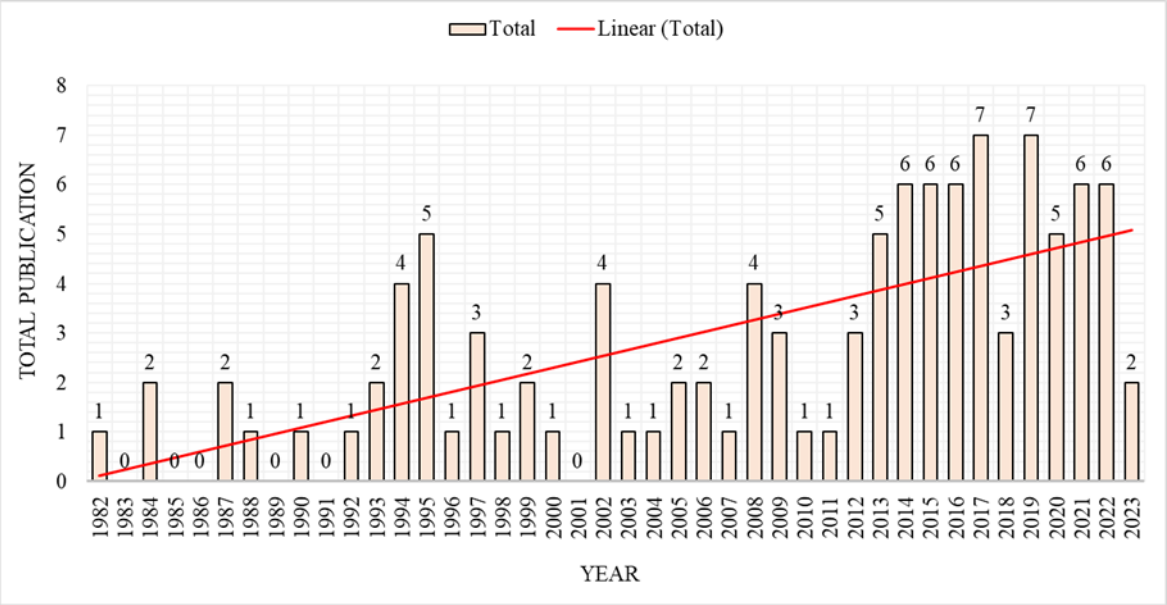


Figure 2.2: Distribution of Published Articles from 1982 to 2023

Figure 2.2 reveals a steady increase over the last decade in SCP Paradigm and industries over the years. This growth reflects the growing scholarly interest in understanding the relationships among market structures, firm conduct, and business performance. The increasing number of publications indicates an expanding knowledge base and research output on the SCP Paradigm, providing a solid foundation for further exploration of its application in different industries. However, since the last search was conducted in April 2023, the results still needed to reflect the full year's data.

2.4 Journals with the Most Published Articles

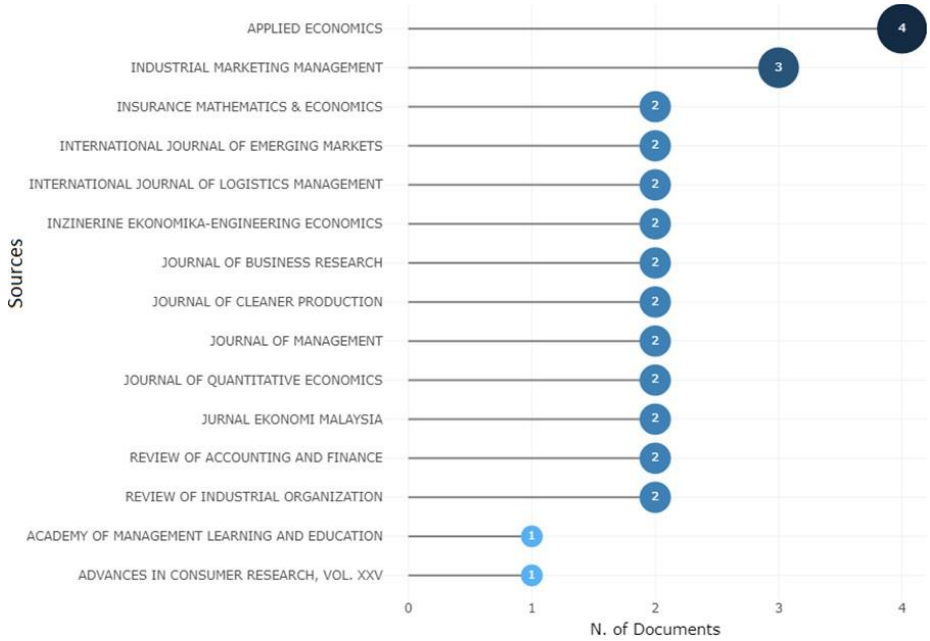


Figure 2.3: Distribution of Published Article by Journal Publication

Figure 2.3 shows the top 15 journals in the Scopus and WoS databases with the most publications on the SCP Paradigm and Industry topic. The Journal of Applied Economics holds the top position in terms of the number of articles published on the SCP Paradigm and Industry topic, with four articles published, followed by other journals shown in Figure 2.3. Thus, the results demonstrated a keen interest in exploring the application of the SCP Paradigm across different industries with each journal publishing two articles in this area. Therefore, it can be inferred that the SCP Paradigm has been researched and utilised in various disciplines and industries.

2.4.1 Authors with the Most Published Articles

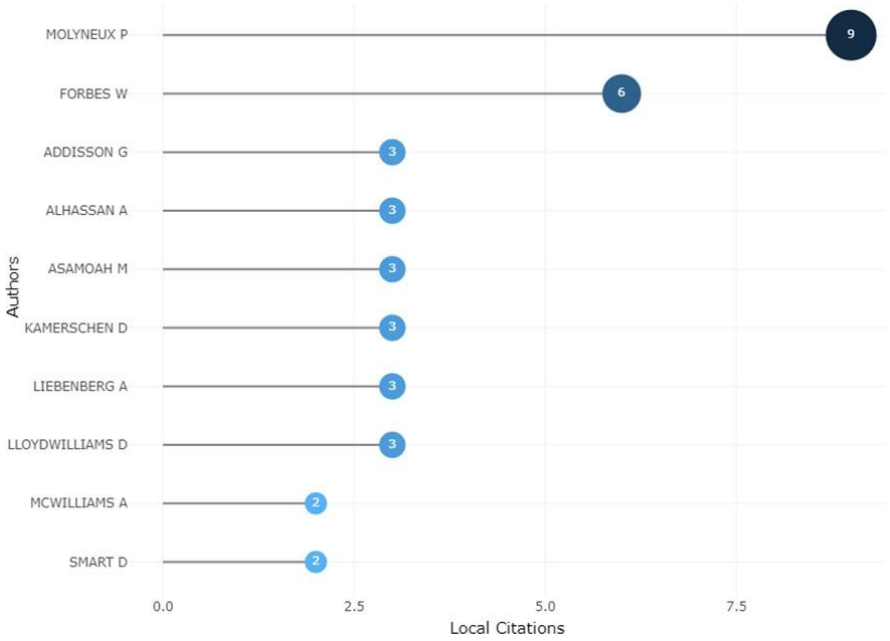


Figure 2.4: Distribution of Published Article by Author

The top 10 authors that contributed to the topic of SCP Paradigm and Industries are displayed in Figure 2.4 with the help of Biblioshiny software, which ran the data across the 111 articles based on the occurrence concept (Fahimnia et al., 2015). Molyneux P is the most prolific author in the dataset, with 9 articles under the author's name.

2.4.2 Authors with the Most Citations

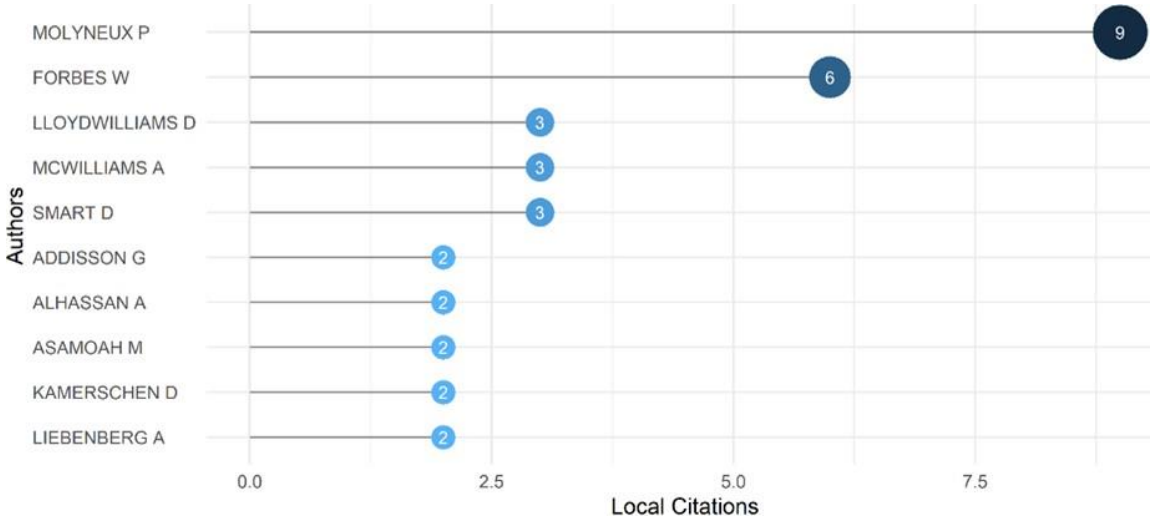


Figure 2.5: Most Cited Authors

Figure 2.5 presents the top 10 most cited authors in the dataset. Molyneux P emerged as the most highly cited author with a total of nine citations, followed closely by Fobes W with 6 citations. The remaining authors in the list each boast three citations, and the least cited authors have two citations each. The results provide insightful information on these authors' contributions to the topic and highlight the scholarly impact of these authors. The number of citations is a quantifiable indicator of their standing and impact in the academic world.

2.4.3 Country with the Most Published Articles

The top 10 countries that have the most publications in SCP Paradigm in the dataset are shown in Table 2.1 and Figure 2.6. The United States is the most active country with 23 publications, followed by China (19 publications), India (11 publications), United Kingdom (6 publications), Australia (6 publications), Spain (4 publications), Indonesia (4 publications), Belgium (3 publications), Brazil (2 publications) and France (2 publications).

Most publications came from developed economies. Thus, the present study has paved the way for future researchers to participate in applying SCP Paradigm in developing economics.

Table 2. 1: Countries with the Ost Research in SCP Paradigm

Country	Frequency (n)	Type of country	Continent
USA	23	Developed	North America
China	19	Developing	Asia
India	11	Developing	Asia
United Kingdom	6	Developed	Europe
Australia	6	Developed	Asia Pacific
Spain	4	Developed	Europe
Indonesia	4	Developing	Asia
Belgium	3	Developed	Europe
Brazil	2	Developing	South America
France	2	Developed	Europe

Note(s): Countries are classified according to the "World Economic Situation and Prospects2020".

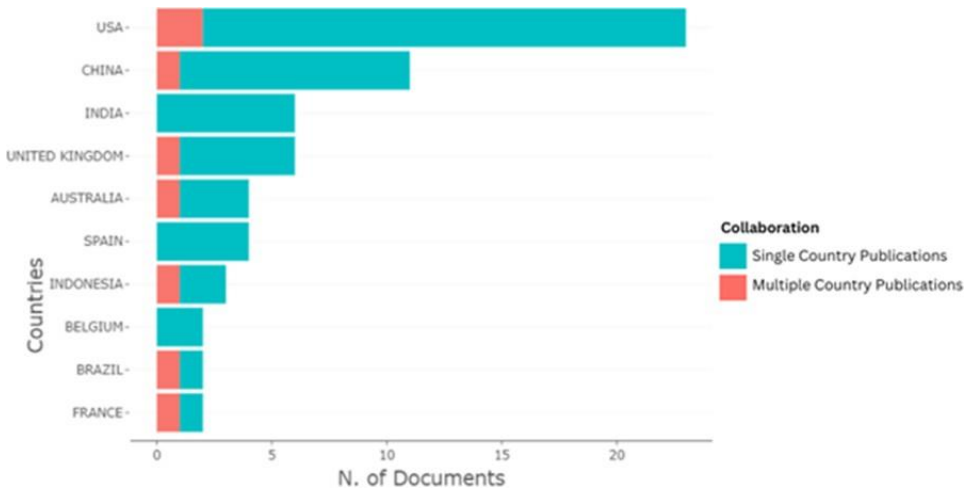


Figure 2.6: Distribution of Published Documents by Country

2.4.4 Co-Occurrence of Keywords Analysis

The content of the published articles was analysed using VOS Viewer software through the co-occurrence of keywords to visualise the most popular topic surrounding SCP Paradigmand industries. Clusters of related concepts are formed based on the frequency with which specific keywords appear together and form a node, and the mapping analysis provides a visual representation of the most often discussed issue (Baker et al., 2020).

Figure 2.7 shows the most frequently used terms with the occurrence of the word set to two times, resulting in 309 keywords. Six clusters were found in the network and represented by various colours. Firstly, the cluster in red shows the most frequently used words: China, commerce, competition, economics, industry, market concentration, market performance, and monopoly. Secondly, the green cluster shows frequently used words: industrial economics, performance, planning, service innovation, structure-conduct-performance, and sustainable development. On the other hand, the blue cluster's most frequently used words are empirical analysis, performance assessment, profitability, SCP Paradigm, and South Africa. Next, the yellow cluster represents the banking sector; competition (economics), structure-conduct-performance, and technical efficiency appear the most in this cluster. Besides that, the purple cluster stands for concentration, efficiency, and market structure, and the Panzer-Rosse model is the widely used keyword in the cluster. Finally, light blue clusters represent developing countries, industrial performance, industrial structure, and theoretical studies as the most frequently used keywords.

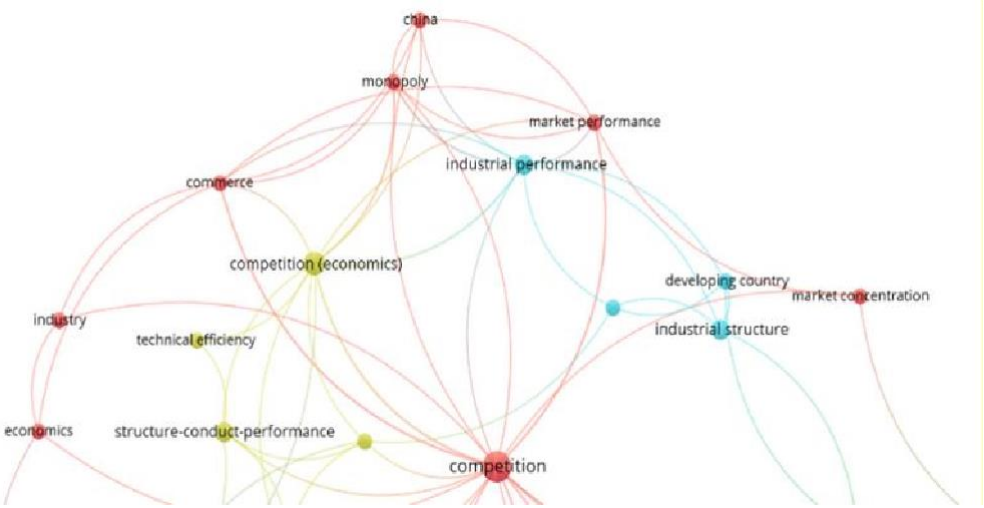


Figure 2.7: Co-occurrence Keywords Analysis: Red Cluster

Figure 2.7 provides insights into the utilisation of the SCP (Structure-Conduct-Performance) Paradigm across various industries, indicating its applicability to the private hospital industry as well. By examining the co-occurrence of keywords, researchers can identify common themes and trends within the SCP Paradigm, establishing its relevance, and this understanding can guide future research by highlighting potential gaps and areas that require further investigation, especially understanding the private hospital sector.

The red cluster that emerged prominently in the co-occurrence keyword analysis highlights the salience of keywords such as competition, market concentration, and performance, demonstrating the widespread application of the SCP Paradigm in analysing the relationship across different industries, suggesting a continued interest in exploring the impact of market structure on firm performance. Future research might delve into the specific mechanisms through which competition affects performance, such as the role of innovation, technological advancements, or efficiency levels. This finding implies that the private hospital industry can also benefit from employing the SCP framework to assess market dynamics and performance outcomes.

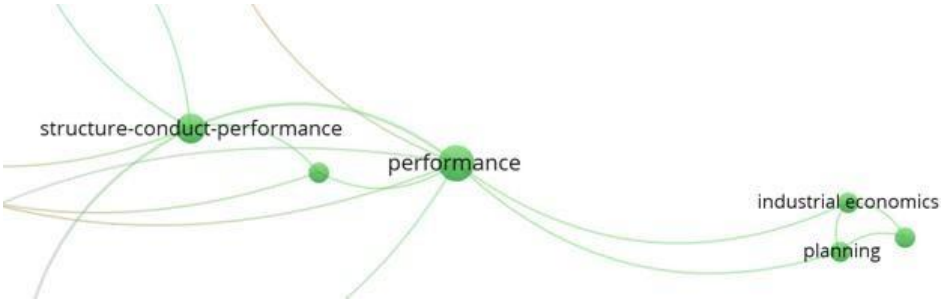


Figure 2.8: Co-occurrence Keywords Analysis: Green Cluster

The presence of keywords such as sustainability, industrial performance, and planning in the green cluster indicates that the SCP Paradigm has been used to investigate the link between sustainable practices and performance in various industries. Future research can delve deeper into the strategies that firms adopt to improve their sustainability performance and assess the impact of these efforts on various aspects of their performance, such as profitability and market share. This suggests that the private hospital industry can also adopt the SCP framework to explore how sustainable practices can impact hospital performance and contribute to long-term sustainability goals.

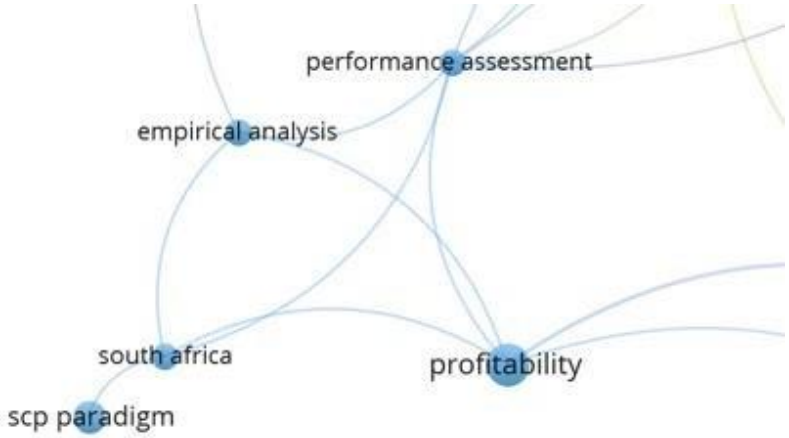


Figure 2.9: Co-occurrence Keywords Analysis: Blue Cluster

The blue cluster, which showcases keywords such as empirical analysis, performance assessment, and South Africa, presents an opportunity for focused research on specific industries or regions. This result suggested that researchers can conduct empirical studies using the SCP framework for the private hospital industry to assess performance.

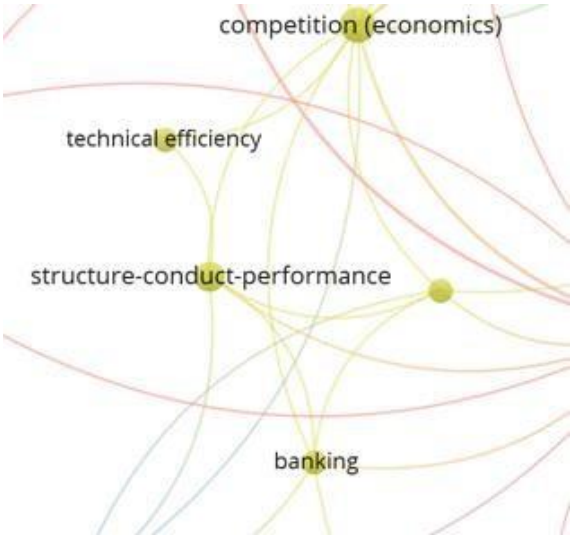


Figure 2.10: Co-occurrence Keywords Analysis: Yellow Cluster

Furthermore, although the yellow cluster relates to the banking sector and may not directly align with the private hospital industry, its inclusion in the bibliometric analysis showcases the versatility of the SCP Paradigm across different sectors. Researchers can leverage insights from this cluster and adapt methodologies and findings to investigate competition, technical efficiency, and their impact on the private hospital industry.

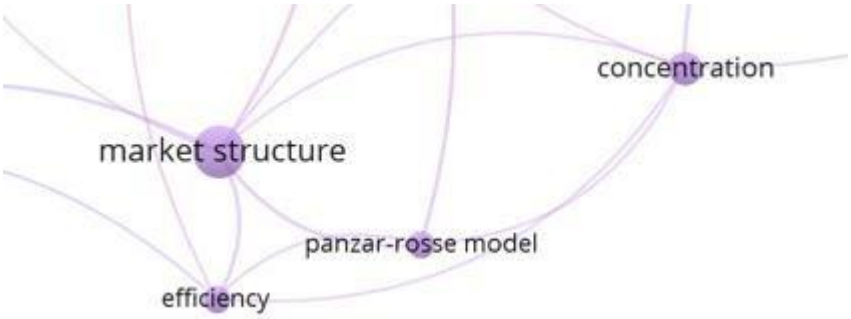


Figure 2.11: Co-occurrence Keywords Analysis: Purple Cluster

The purple cluster indicates a potential area for research focused on using specific models, such as the Panzer-Rosse model, to analyse the relationship between market concentration, efficiency, and market structure. The private hospital industry can benefit from such models to analyse the relationship between market concentration, efficiency, and market structure, providing valuable insights into performance and informing effective strategies.

In summary, the co-occurrence of keyword analysis underscores the wide-ranging utilisation of the SCP Paradigm across various industries. Although the primary focus is on demonstrating the application of the SCP framework in different sectors, including its relevance to the private hospital industry, the findings signify the adaptability and potential applicability of the SCP Paradigm in investigating market dynamics, competition, performance, and efficiency. The results support the use of the SCP framework as a valuable tool for understanding and analysing the private hospital industry within the broader context of industrial organisations.

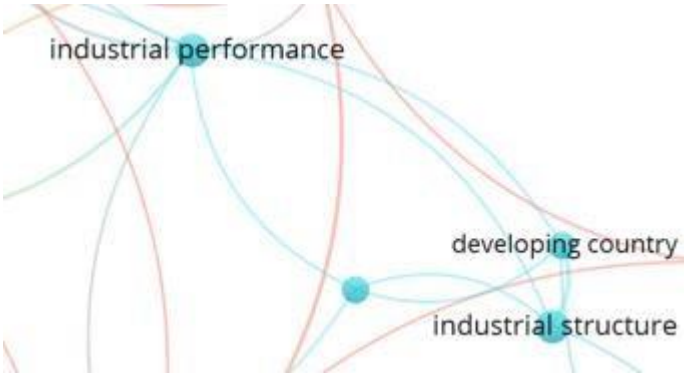


Figure 2.12: Co-occurrence Keywords Analysis: Light Blue Cluster

The light blue cluster, characterised by co-occurring keywords "industrial performance," "developing country," and "industrial structure," suggested a shared research focus on exploring the intricate relationship between industrial dynamics, economic factors, and policy implications in developing countries. Studies in this cluster would likely investigate how the structure of industries influences overall performance and vice versa, offering a nuanced exploration of industrialisation in developing countries and its broader implications.

2.5 Systematic Literature Review

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) is a recommended approach to synthesizing the findings from the most prominent selected studies in this research field. PRISMA is the basis for the SLR method in this study. The four PRISMA stages outlined by Moher et al. (2009) are identification, screening, eligibility evaluation, and identification of the findings. The approach allows the data collection and the final number of papers selected for review to be transparent.

Data was sourced from reputable databases: Scopus and Web of Science (WoS). Search keywords applied for this study are as follows: “SCP PARADIGM " OR

“STRUCTURE CONDUCT AND PERFORMANCE PARADIGM”AND “INDUS*”.

Table 2.2: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Literature Type	Scholarly journals	Books, website articles, reports, pamphlets, and conference proceeding.
Language	English	Other than English language
Publication Period	Until search date 20th April 2023	No exclusion
Subject Area	Accounting, Business, Economics, Econometrics, Management, and Finance.	Other subject area that are not listed in inclusion section
Focus	Market Structure, Conduct of the firm, Firm’s performance, Review and Reporting method.	Non-Business Economic Journal

Source: Author’s criteria settings for SLR

The keyword search mainly focused on mapping the existing literature on SCP Paradigm in the fields of Accounting, Business, Economics, Econometrics, Management, and Finance. The search was performed in April 2023, yielding 131 articles (Scopus 74 articles and WoS (57 articles) with inclusion criteria in Table 2.2. The study did not restrict the search to a specific publication period but included all relevant publications regardless of publication dates. Articles that did not fit inclusion criteria were excluded from screening. Furthermore, 20 articles were found to be duplicates and removed before the screening process.

Only scholarly journals were included in the SLR to maintain the review's quality, and all duplications were adequately scrutinised. The abstracts of the papers were thoroughly verified for analysis to verify the quality and relevance of the academic material for the

review process. Subsequently, each research article was carefully evaluated. After evaluating each item against the inclusion and exclusion criteria, 30 articles were chosen. Figure 2.8 of the PRISMA Framework shows the inclusion and exclusion of material at each level.

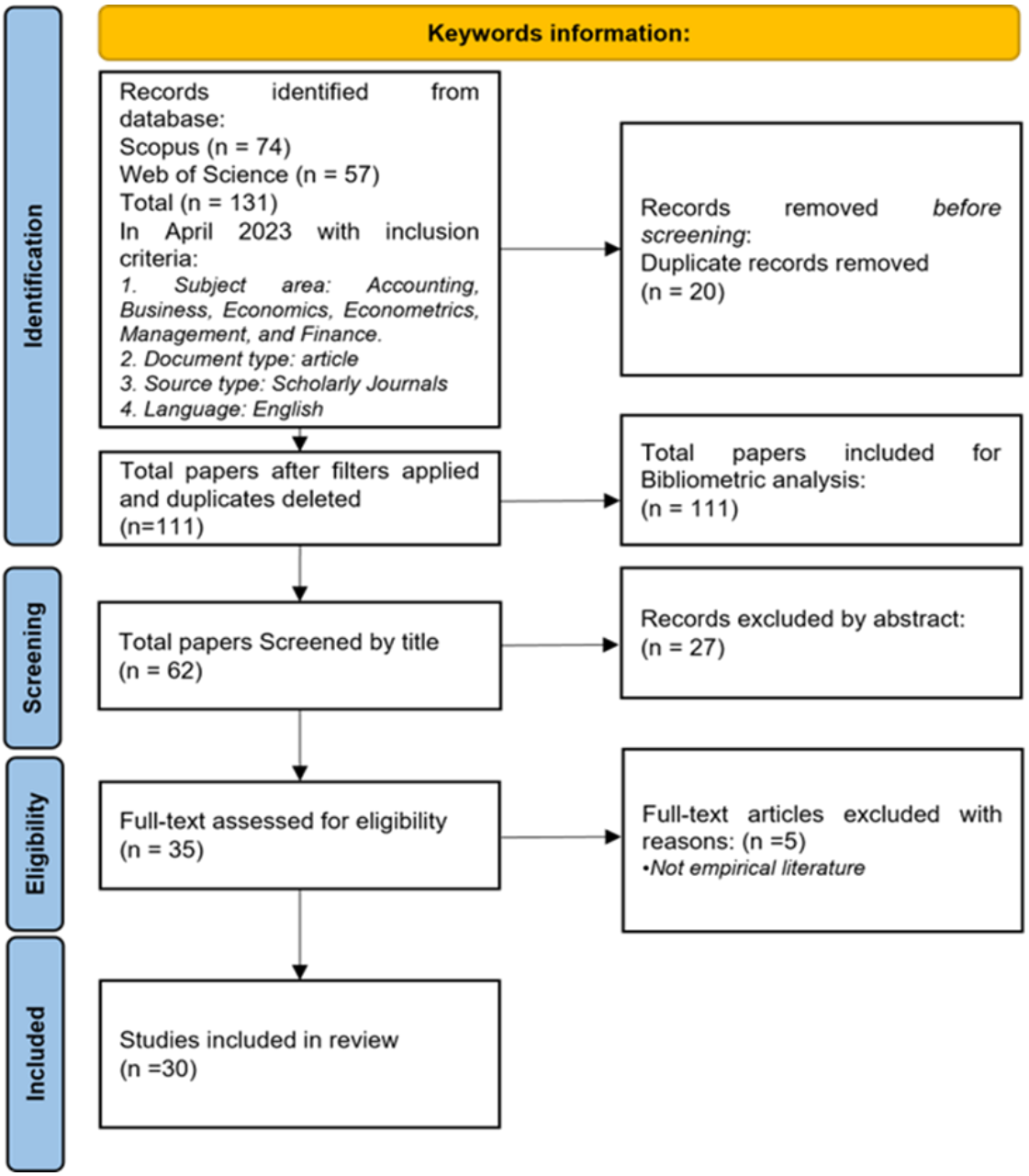


Figure 2.13: PRISMA Framework

All relevant literature on SCP Paradigm and industries has been included. Even though the initial search was performed using the title, it needed to be revised. Thus, another screening procedure was then applied by reviewing the abstract and conclusion of each article that passes the screening title stage. When the information fits the criteria for empirical literature publication, then the article would be included in the analysis. After evaluating the remaining 35 full-text papers for their eligibility and appropriateness for this systematic review, 5 were omitted, leaving only 30 articles selected for this comprehensive review.

2.5.1 Content Analysis

Tables 2.3 and 2.4 summarise the 30 articles in the systematic literature review. Most publications about Structure Conduct and Performance Paradigm were conducted in the banking industry, comprising 40% (12 publications) that focus on the bank's performance, followed by the insurance and manufacturing industry has 13% (4 publications) respectively. The publications categorised under the "other" category contributed to 33% (10 publications). Most of these articles focused on performance, and the main intention of these articles was to foster competition by accessing market structure (Camino-Mogro & Bermúdez-Barrezueta, 2019; Jumono et al., 2019; Mukhopadhyay & Chakraborty (2016).

Table 2.3: Publications Distribution based on Industry.

No.	Industry	Frequency (n)	Percentage (%)
1	Banking	12	40%
2	Insurance	4	13%
3	Manufacturing	4	13%
4	Other	10	33%

The results of the SLR indicate that the SCP Paradigm has been applied effectively in various industries, but more extensive research is needed to study its application in the private hospital industry. Given that the SCP paradigm is commonly used to assess competition levels and examine the interplay between Structure, Conduct, and Performance, this study aims to utilise the SCP paradigm to analyse the market structure of the private hospital industry and investigate the relationship between Structure, Conduct, and Performance across different industries. By conducting a content analysis based on industry classification, the gap in previous studies was identified to include the private hospital industry in the SCP paradigm analysis. Due to the scarcity of published articles that specifically address the SCP Paradigm in the context of the private hospital industry, this study reviewed relevant articles that explore competition levels in industries and examined the relationship between market Structure, Conduct, and Performance.

2.5.2 Banking Industry

For the banking industry, the SCP paradigm has been extensively applied across the globe since the market concentration of the Spanish banking industry and the significant

impact of the market concentration towards the profits earned by the market players within the banking industry. The study utilised Data Envelopment Analysis to determine income and cost efficiencies and employed a panel data model for estimation. Its findings indicate a positive correlation between efficiency and market competition, emphasising the importance of achieving an optimal level of concentration and competition for banks to operate effectively. Policymakers and regulators can leverage this information to develop policies and strategies that optimise the number of banks in the industry (Lloyd-Williams et al., 1994).

Also, the SCP paradigm has been employed by Molyneux and Forbes (1995) to address the Pakistani banking performance concerning the market structure of the banking industry, like the study conducted by Lloyd-Williams et al. (1994) in the Spanish banking industry. In addition to using the SCP paradigm, the study also utilised the Efficient Structure (ES) paradigm to measure the level of efficiency of the Pakistani Banking industry. In this study, the findings show that the ES paradigm is more relevant than the SCP paradigm in the efficiency of the Pakistani banking sector as the SCP paradigm is more relevant to enhancing competition within an industry.

Additionally, the use of the SCP paradigm has become prevalent over time within the banking industry to address issues such as market concentration impacting the level of competition in the banking industry in Turkey. It was developed by analysing the performance and efficiency of the banking industry (Çelik & Kaplan, 2016). The article examines the relationship between performance and concentration in the Turkish banking industry by using performance measures such as ROA and ROE and concentration measures such as CR5 and HHI. However, the findings showed no correlation between market structure and the banks' performance.

On the contrary, Mohammed et al. (2019) looked at the efficiency and level of competition in Malaysia's banking industry and showed that they have a positive relationship. Malaysia's dual banking market comprises Islamic and conventional banking systems, and the study conducted between 1997 and 2016 examined whether the type of efficiency matters for banks to remain viable in a highly competitive market. Policymakers and regulators may use the knowledge of market structure and performance from this study to develop policies and strategies that will optimise the number of banks operating in the industry.

Overall, the analysis from the PRISMA framework concludes that the studies conducted between 1994-2019 have evolved around analysing the banking industry's performance, efficiency, and level of competition. Researchers in various countries widely use the SCP paradigm to examine the banking industry's performance and the level of competition. It is critical to note that the SCP paradigm provides a theoretical framework to analyse the firm's market structure and its behaviour, as these variables are useful for policymakers to assess the level of concentration in a market that will yield different outcomes on the behaviour and the performance of firms in the industry.

The relevance of the SCP paradigm may vary depending on the development stage of the banking sector and the degree of competition in the market. Therefore, researchers should continue to examine the relevance of the SCP paradigm in different countries and periods and explore other theoretical frameworks that may provide a better understanding of the performance of the banking sector. Furthermore, previous studies posit that the Efficiency Structure (ES) paradigm is also important in analysing the industry's efficiency level in achieving a significant outcome on banks' profitability. Thus, both ES and SCP

paradigms are essential in yielding findings on the banking industry's efficiency, performance, and level of competition.

2.5.3 Insurance Industry

As for the insurance industry, the use of SCP Paradigm has increased gradually since 2008, which was studied in South Africa, Ghana, Ecuador, and Indonesia. The SCP paradigm has gained widespread use in analysing market competition across various industries. According to the SCP paradigm, the market structure has a significant impact on market conduct, performance, and power. This relationship has been studied in diverse sectors, such as auto insurance and life and non-life insurance markets.

A previous study conducted on the auto insurance market by Liebenberg and Kamerschen (2008) focused on the relationship between market structure, conduct, performance, and power in the South African auto insurance market from 1980-2000. Specifically, this study aimed to determine whether the SCP framework can be applied to the South African auto insurance market and whether different measures of market concentration impact the market conduct, performance, and power of different sellers. Also, the study examined the cyclical patterns of profits in the market and established whether they are related to concentration measures. The study found no link between market structure and market conduct, performance, and power in the South African market. Although profits follow a cyclical trend, they are not statistically significantly related to different sellers' concentration measures.

On the other hand, Alhassan et al. (2015) examined the relationship between market structure, efficiency, and profitability of insurance companies in Ghana. Specifically, the study aimed to determine whether a relationship exists between market concentration and

the efficiency and profitability of insurance companies in Ghana. Compared to the previous study, which focused on the three elements of the SCP paradigm and power, this study focused on market concentration, profitability, and efficiency of the insurance company in Ghana. This study revealed a causal relationship between the three elements of the SCP paradigm, where higher market concentration decreases the profitability of non-life insurance companies. At the same time, efficiency has a positive impact on profitability.

Furthermore, in 2019, a study examined the level of competition in the insurance industry which was conducted for life and non-life insurance companies in Ecuador. The study aimed to investigate the impact of different factors, such as market structure, competition, financial performance, and risk management, on the profitability of insurance companies in Ecuador. The study found that market concentration positively affects profitability, whereas other variables, such as subsidies, risk, and interest rates, have a negative impact.

Another study was conducted in the case of insurance companies in Indonesia, and it aimed to investigate the relationship between market structure and profitability in the Indonesian Islamic insurance industry. Specifically, the study aimed to identify the impact of market concentration, market share, and other market structure variables on the profitability of Islamic insurance companies in Indonesia. The study yielded different findings, where it found that competition from conventional insurance companies negatively affects the profitability of Islamic insurance companies. However, higher market concentration has a positive effect on profitability.

Overall, Liebenberg and Kamerschen (2008) argued that there is no clear link between market structure and performance in the South African auto insurance market, while

Camino-Mogro and Bermúdez-Barrezueta (2019) suggested that market concentration has a positive effecton profitability in the Ecuadorian market. Alhassan et al. (2015) argued that efficiency positively impacts profitability in Ghana's insurance markets, while Setiawan et al. (2012) suggested that competition from conventional insurance companies negatively affects the profitability of Islamic insurance companies.

Various studies have utilised concentration ratios and the Herfindahl Index as measures of market structure to gain insight into the level of competition in different markets. For instance, research on the Ghanaian insurance market found that the non-life market had more firms, resulting in less concentration than the life insurance market, which had fewer and more concentrated firms. Additionally, past studies also evaluated the efficiency scores of firms in different markets, with findings showing that Ghanaian life insurers were more efficient compared to non-life insurers. This result indicates that implementing policies that foster efficiency, such as technology adoption, could enhance profitability in the insurance sector.

In summary, these studies investigate five key issues, including the use of the SCP paradigm to analyse competition, examining the relationship between market structure and performance in various industries, using different empirical methods to determine profitability in different sectors, analysing market structure using concentration ratios and the Herfindahl Index, and examining the efficiency scores of firms in different markets. While these studies share similarities in their approach, there are also disparities in the methods used and the results obtained.

2.5.4 Manufacturing Industry

Aside from the banking and insurance industry, the manufacturing industry has also gained the researcher's interest in analysing the industry's structure, conduct, and performance since 2008. A study conducted on China's manufacturing industry aims to examine the impact of globalisation and technological change on the performance of manufacturing firms in China. Specifically, the study investigated how factors such as foreign direct investment, technology transfer, and export orientation affect the productivity and profitability of Chinese manufacturing firms. The authors find that firms with a competitive advantage in the domestic market are more likely to export and have a higher level of export intensity.

Meanwhile, Gereffi (2018) put a broader focus on the macro-level drivers of firm performance in a rapidly changing global economy, and another study focuses on structural change and market power in the US food manufacturing sector by Martadi et al. (2014) looked at on the micro-level factors influencing the market structure and firm behaviour. This study examined the extent to which market power has contributed to the structural changes in the U.S. food manufacturing sector from 2002 to 2012 and investigated the factors that have influenced concentration levels in the sector, including mergersand acquisitions, entry and exit, and technological change. The authors find that firms with greater market power can increase prices and generate higher profits, and mergers and acquisitions tend to lead to higher market concentration and less competition.

Furthermore, a study conducted in the United States in 2009 and India in 2017 both analysed the level of competition in the industry. Stiegert et al. (2009) analysed the competitive behaviour and market power of firms in the United States manufacturing

industry. Specifically, the study aims to investigate the extent to which market power is exercised by firms in the industry and its impact on prices, output, and efficiency by employing econometric techniques and market structure analysis to assess the degree of competition and market power in different manufacturing industries, including food, textiles, chemicals, and electronics. The study suggested that market power is a significant issue in the U.S. manufacturing industry, with some industries exhibiting high levels of market power that can lead to higher prices and lower output.

In another study, Mukhopadhyay and Chakraborty (2016) examined the impact of environmental regulations on the productivity and competitiveness of firms in the Indian manufacturing industry. Specifically, it investigated how compliance with environmental regulations affects the technical efficiency and total factor productivity of firms and how these effects vary across different manufacturing industries and regions. The study found that environmental regulations significantly negatively impact the productivity and competitiveness of firms in the Indian manufacturing industry, particularly for SMEs.

In summary, the SCP paradigm is an essential tool for the manufacturing industry in accessing the industry's structure, conduct, and performance. Although the paradigm was created over six decades ago, its fundamental principles remain valid in many industries. However, the studies conducted within the manufacturing industries revealed that the link between market structure, behaviours, and outcomes is only sometimes direct. Other factors, such asanti-competitive tactics, can impact a company's performance even in a competitive market. It is crucial to comprehend how these structural changes have affected the performance of firms and the overall market. Therefore, while the SCP paradigm has been a valuable tool for analysing industries, it is necessary to consider additional factors beyond a

one-way causal relationship.

2.5.5 Other Industries

The SCP (Structure-Conduct-Performance) framework has been widely accepted and utilised in various fields such as industrial organisation, antitrust policy, and market analysis. The framework has been influential in understanding market power and its effects on industry structure, firm conduct, and overall market performance. Wood et al. (2021) used the SCP model as an organizing framework to analyse corporate market power. The study mentioned that the SCP model has been influential in industrial organisation and antitrust scholarship, fields that have traditionally had major concerns with the structure and functioning of industries and their markets. Besides, the traditional SCP approach has been widely used to assess market power based on the relationships between industry structure, firm conduct, and industry performance. The study also mentioned an assessment of industry and market structure as a crucial step in exploring the market power of firms, highlighting the relevance of the SCP framework.

In the study conducted by Lelissa (2018), the Structure-Conduct-Performance (SCP) framework emerges as a versatile analytical tool and finds application not only in economics but also in diverse fields like business management. Scholars across disciplines have employed the SCP framework to investigate a wide array of industries and markets, with particular attention given to its application in the banking sector. This framework has garnered substantial support, becoming a prominent method for exploring the intricate relationships between market structure, firm conduct, and performance. Its widespread use can be attested to its effectiveness in providing valuable insights into the dynamics of various sectors, contributing to a deeper understanding of how market conditions influence the

behaviour and outcomes of firms.

Panhans (2023) highlighted the substantial impact of the Structure-Conduct-Performance (SCP) paradigm on academia and policymaking, serving as the foundation for antitrust analysis at the Federal Trade Commission (FTC) and Department of Justice (DOJ). Initially influential, criticism rose over time, citing the framework's simplicity and its narrow focus on structure-to-performance causality. Acknowledging limitations, SCP researchers recognised endogeneity and external influences on market structure. The paradigm faced decline with the advent of game theory in the 1970s, offering a more nuanced understanding of imperfect information and anti-competitive behaviour. Presently, SCP is criticised as too simplistic for real-world markets, yet it remains a significant historical contributor to industrial organisation economics, with Joe Bain recognised as a pivotal figure in the field.

Jacob et al. (2023) delved into the Structure Conduct Performance Model (SCP) in their examination of the performance factors influencing deposit money banks in Nigeria. The paper employs accounting performance variables as proxies to forecast the share prices of these banks. Additionally, the study incorporates an empirical review section, spotlighting other research endeavours that previously investigated the connection between financial performance indicators and stock prices. This research contributes to the understanding of how the SCP model can be applied to analyse and predict the performance of deposit money banks, providing valuable insights into the dynamics of the Nigerian banking sector.

In addition to the three industries discussed above, the structure, conduct and performance of the hotel industry have also attracted researchers' attention in the literature. Tung et al. (2010) examine how market power and strategic conduct affect profitability in the international tourist hotel industry. The research used SCP analysis and found that

market concentration can increase firms' profits through strategic branding and advertising, concluding that the industry is profit-driven, and firms use different methods to maintain their market positions and increase profits. However, the study also highlights the importance of considering stakeholders like customers and employees when analysing the industry's dynamics. Overall, the study emphasises the importance of strategic conduct in the hotel industry and the need for firms to adapt to changing market conditions to stay competitive.

In the pharmaceutical industry, Schramm and Hu (2013) revealed that changes in the industry's structure, such as increased competition and patent expirations, have influenced firms' conduct towards incremental innovation and cost-cutting rather than breakthrough discoveries. Using the SCP paradigm, the study analysed the changes in conduct and performance in the branded sector of the pharmaceutical industry from 1980 to 2011, focusing on R&D strategies. The study showed that the changing industry structure resulted in a shift towards a more cautious approach to innovation, with firms focusing on incremental advances to existing products rather than developing entirely new ones. The findings suggested that the industry's focus on cost-cutting and incremental innovation has become more pronounced in recent years due to patent expirations and increased competition.

Setiawan et al. (2012) investigated the impact of industrial concentration on price rigidity, technical efficiency, and price-cost margin in the Indonesian food and beverages industry. The results showed that higher industrial concentration led to higher price-cost margins and lower technical efficiency and concluded that policies should be implemented to promote competition and reduce the industrial concentration to increase technical efficiency and lower prices. These findings suggested that the Indonesian food and beverages

industry would benefit from increased competition and a more efficient market structure.

Furthermore, Kroupová et al. (2022) looked at Czech food processing and investigated the relationship between profitability and market power represented by larger market shares among companies, using the Relative Market Power (RMP) and Efficiency hypotheses. The study found no significant relationship between market power and profitability, indicating that larger market shares do not necessarily lead to greater market power and higher profitability. This highlights the need for companies to focus on other factors, such as efficiency, to improve profitability rather than relying solely on market power.

Sheel (2016) compared the relevance of the SCP paradigm and class effect in performance between restaurants and petroleum firms and concluded that the SCP paradigm and industry-specific factors are directly relevant to firm performance in both industries. However, the role of class effect varies depending on the industry and performance group. The study suggested that while SCP analysis is an efficient framework for analysing competitive environments, the application of class effect must be done cautiously and tailored to specific industries and performance groups. Therefore, this study evaluated the SCP paradigm and class effect by comparing them in two diverse industries.

SCP paradigm provides a useful framework for analysing competitive environments in different industries. It offers several benefits, such as deepening knowledge and understanding of industry concentration and firm profitability, providing policymakers with a platform to intervene and shape the industry's direction, and helping firms understand their competitor's strategies and adapt accordingly. Through analysing research articles that use SCP analysis, a well-rounded understanding of its applicability, limitations, and relevance

to various industries can be gained. Overall, SCP analysis can help firms maintain a sustainable competitive advantage in the market.

To summarise, Table 2.4 represents the summary of the content analysis on the systematic literature review that has been discussed in this sub-section. The following table provides a clear summary of the methodology, region, industry, findings, and research gaps of the 30 articles.

Table 2.4: Summary of Content Analysis on Systematic Literature Review

Author	Region/ Continent	Context	Method/ Measurement	Data	Findings	Gaps
(Kroupová et al., 2022)	Czech Republic	Food Industry	HHI, CR4, ROA, MS, GMM, GLS, SFA	Czech food processing industry data from 2016-2020.	The result shows that greater market power represented by a firm's market share does not explain performance.	The reviewed study investigated the relationship between market power, efficiency, and performance in the Czech food processing Industry.
(Arif & Firmansyah, 2021)	Indonesia	Insurance Industry	HHI, ROA, MS, FEM	Islamic life insurance companies in Indonesia report from 2012-2019.	The result indicates that market structure affected the profitability of the Islamic life insurance industry.	The reviewed study explored the relationship between market structure and profitability in insurance.
(Goel & Nelson,2020)	More than 100 countries	Manufacturing and Service Industry	Logit or logistic regression	World Bank's Enterprise Surveys from 2006-2016.	Older companies have a different approach toward R&D than major companies, which usually have a positive attitude.	How motivation affects performance in more than 100 emerging economies. Other studies evaluated the impact of certificates' influence on

Table 2.4: continued

						company performance in a specific country.
(N. Mohammed etal., 2019)	Malaysia	Banking Industry	HHI, CR8, ROA, PR, OLS	Malaysia's conventional and Islamic bank financial data from 1997 to 2016.	Positive relationship between types of efficiency and competition in the dual banking market.	The reviewed study explored whether efficiency in banking operations will help banks survive in a highly competitive market environment.
(Camino-Mogro & Bermúdez-Barrezueta, 2019)	Ecuador	Insurance Industry	HHI, MS, ROA, DEA	Financial information of insurance firm from 2001 to 2017.	HHI is a determinant of profitability only in the life insurance.	The reviewed study identified factors that determine profitability in the life and non-life insurance industry.
(Jumono et al., 2019)	Indonesia	Banking Industry	HHI, CR5, MS, ROE, BEP, GMM, OLS, FEM	Indonesian banks financial statements from 2001-2014.	Market structure, banking characteristics, and performance significantly influence profitability.	The reviewed study looks at a more prolonged period from 2001-2004; its factors in deposit and credit markets and used DPD Arrelano Bond as analysis.

Table 2.4: continued

(Tan et al.,2017)	China	Banking Industry	NIM, ROA, ROE, LI, SFA	China's bank data from 2003-2013.	Both risks significantly related to bank profitability in China, low level of competition and aid commercial banks to earn higher profits.	The reviewed study focuses on one or two types of risk, this study explored in depth different type of risk that has impacts on bank profitability in China and made policy suggestions to the Chinese government and banking regulators.
(Gavurova et al., 2017)	Europe	Banking Industry	HHI, CR5, MS, ROA, ROE, OLS	Annual data of EU banking sectors from 2008 to 2015.	There is a causal link between banking sector performance and banking market concentration.	The reviewed study examined regression or correlation tests. This study analyses the relationship in terms of causation.
(Khan &Hanif, 2018)	Pakistan Industry	Banking	NIM, HHI, CR, ROA ROE, MS, FEM,	24 commercial banks of Pakistan	Weak relationship	Reviewed study has

Table 2.4: continued

				from 1996 to 2015.	between market structure indicators and bank performance, empirical assessment results don't support SCP or RMP; ES paradigm is more appropriate for Pakistan.	differing viewpoints on how the market structure has changed, this study reviewed SCP, RMP, and ES paradigms and Pakistan's banking industry.
(Mukhopadhyay & Chakraborty, 2016)	India	Manufacturing Industry	HHI, CR5, ROA, LI, Tobin's Q, PVAR Model	BSE listed manufacturing firm from 2001-2013.	Competition hasn't eradicated market imperfections; larger businesses still employ anticompetitive tactics to sway the market.	There are very few studies that use panel data to illustrate dynamic competition; this study addressed it by exploring the connection competition and business performance.
(Çelik & Kaplan, 2016)	Turkey Industry	Banking MS,	CR5, ROA, Regression analysis, DEA	Turkish banking data	Efficiency is the most significant element in bank profitability, concentration is equally crucial. The	The reviewed study

Table 2.4: continued

					data also showed that bank market share had no influence on profitability.	used Turkish banking industry data from 2008-2013 to examine SCP approach on bank performance and determinants.
(N. Mohammed etal., 2015)	Malaysia	Banking Industry	HHI, CR4, Weighting scheme	Bank level data from 2000-2010	The result shows evidence that structural changes in the Islamic banking industry have shifted the market structure from moderately concentrated to low concentrated, confirming the presence of a competitive environment in the Malaysian banking market.	The reviewed study focused on the conventional banking system; this study looked at the Islamic banking market in terms of changes in market concentration using a structural approach framework.
(Arrawatia et al. 2015),	India Industry	Banking Regression	LI, analysis DEA,	Banks data from 1996 to 2011.	The result show competition promotes efficiency.	The reviewed studies use HHI to

Table 2.4: continued

						measure competition, this study used the Lerner Index approach and accessed the relationship between competition and efficiency using the DEA approach.
(Poquiz, 2015)	Philippines	Power Industry	HHI, Regression analysis	Luzon Wholesale Electricity Spot Market (WESM) data from the period of 2006 to 2010.	The study found that electricity prices were not significantly affected by market concentration.	The reviewed studies found liberalisation does not always result in cheaper electricity, This study tests whether electricity prices are significantly influenced by the shift in market concentration.

Table 2.4: continued

(Sung, 2014)	24 OECD Members Countries	Telco Industry	HHI, Profits, Price, Regression analysis	24 OECD member states from 1998-2011.	The study supported the market power hypothesis; the more concentrated the market, the higher the prices and profits.	The study analysed market concentration in OECD member states and evaluated the relationship between market concentration and performance.
(Liu et al.,2013)	China	Construction Industry	Regression analysis, PR	Annual reports of the listed building enterprises from 2009 to 2011.	The study found competition is monopolistic, but entrance is relatively easy, creating a free-entry equilibrium in China's construction industry.	The reviewed study used a structural approach; this study used a non-structural approach to analyse the market structure of the construction industry.

Table 2.4: continued

(Schramm & Hu,2013)	United States	Pharmaceutical Industry	OLS	Pharmaceutical firms' data in the United Stated from 1980 to 2011.	The study concludes structural changes help mitigate the issues facing the branded drug industry and induce more changes in its conduct.	This study used the SCP paradigm to explore changes in the pharmaceutical industry.
(Setiawan et al., 2012)	Indonesia	Food and Beverages Industry	HHI, CR4, PCM, GMM, DEA	Indonesia's Annual Manufacturing Survey from 1995-2006.	The results imply a relationship between industrial concentration, pricing rigidity, technological efficiency, and price-cost margin, with a positive bi-directional interaction between the two.	This study extended the framework of SCP with price rigidity and technical efficiency as the variables.

Table 2.4: continued

(Stiegert et al., 2009)	United States	Manufacturing Industry	CR4, AD, PCM, MES, 2SLS	Food and Tobacco Processing Industries from 1970s to1990s.	Both high and poor performance levels provide signals for industries to merge, and mergers raise entry barriers (by advertising), thus increasing profits.	The reviewed study used data from years before 1980, conducted in TS format and restricted performance to determine the structure; this study used simultaneous intertemporal relationships.
(Tung et al., 2010)	Taiwan	Hospitality Industry	CR4, MS, Labour Intensity, Capital Intensity, Total Operating Cost,OLS, 3SLS	Operational analysis reports for international tourist hotels from 1995-2006.	The result show there is two-way causes and effects exist between market structure and strategic behaviour.	The reviewed study uses the profit impact of the market strategies model, which lacks feedback effect; this study used the SCP model to examine causal flow and feedback effect.

Table 2.4: continued

(Prasad & Ghosh, 2007)	India	Banking Industry	H Statistic, PR	Annual data of commercial banks from 1996-2004.	Results indicated monopolistic behaviour for banks across all periods and bank types, H-statistic being strongest for the second sub-period and for both private and international banks.	The level of competition in Indian banking has not been studied, this study assessed the level of competition within the banking industry.
(Liebenberg & Kamerschen, 2008)	South Africa	Insurance Industry	CR4, HHI, Price, Profit, OLS	Insurance companies published report from 1980-2000.	The study showed there is a link between market structure and market conduct, whereas performance and power are not present.	The reviewed study investigated the aggregate South African insurance market, this study focuses African auto insurance market.
(Fung et al., 2008)	China	Manufacturing Industry	Logistic model and export intensity with aTobit model, LI	Annual Census of Chinese Industrial Firms in China from 1998-2005.	The result showed the firm that has competitive advantages tend to have higher export intensity.	The reviewed study uses Western firm data and survey data (cross-sectional); this study used longitudinal data.

Table 2.4: continued

(Young et al., 1996)	Austria	Software Industry	Regression analysis	Public-owned computer U.S. software firm report from 1983 to 1991.	The findings reveal that business performance improves in the presence of more competitive firms but deteriorates in the presence of more intense competition between firms.	The reviewed study between the Austrian school and SCP paradigm has a different perspective; this study uses a dynamic model of competitive activity at both the industry and firm levels.
(Molyneux & Forbes, 1995)	Europe	Banking Industry	HHI, CR4, ROE, ROA, Granger Causality Test	18 European country's bank reports from 1986-1989.	The result shows that concentration in the European banking industry reduces the opportunity cost of collusion, leading to higher-than-average earnings for all market players.	The reviewed study has many consistencies in providing a description of the SCP relationship in banking. This study tested both approaches in the context of the European banking market.
(Lloyd-Williams etal., 1994)	Spain	Banking Industry	MS, CR4, Regression analysis	Spanish bank accounting data from 1986-1988.	The findings imply that increased market concentration in the Spanish banking sector has reduced	Two competing hypotheses between SCP paradigm and efficiency hypothesis, this study tested both

Table 2.4: continued

					the costs of collusion and led to higher-than-average profits for all market players.	approaches.

Note: Advertising Intensity (AD), Concentration Ratio (CRn), Data Envelopment Analysis (DEA), Fixed Effect Model (FEM), Generalized Approach of Moment (GMM), Generalized least squares (GLS), Herfindahl-Hirschman Index (HHI), Lerner Index (LI), Market Share (MS), Minimum efficient scale (MES), Net interest margin (NIM), Ordinary least squares (OLS), Panzar-Rosse Model (PR), Price-cost margins (PCM), Return on Assets (ROA), Return on Equity (ROE), Stochastic Frontier Analysis (SFA), Three-stage least squares (3SLS), Two-Stage least squares (2SLS).

Source: Author owns construction based on systematic literature review using preferred reporting items for Systematic Reviews and Meta-Analyses (PRISMA)

2.6 Underpinning Theory of Industrial Organisation

The present study is based on the theory of industrial organisation, which emphasises the effect that the structure of a market has on the strategies and decisions companies use. The Industrial Organisation theory is where firms compete within the industry and how market structure and policy can affect the aspects of competition. Several factors, including economies of scale, product differentiation, and barriers to entry, can drive market structure. A few market structure theories can be categorised as imperfect competition, including monopolistic competition, oligopoly, and monopoly. Monopolistic competition refers to an industry where there are many firms, but each produces a slightly different product, giving them some degree of market power. Oligopoly refers to an industry with only a few large firms, each with significant market power. Finally, monopoly refers to an industry with only one firm with complete market power (Raible, 2013).

One of the most influential ideas in Industrial Organisation economics may be traced back to 1933 when Harvard economists Edward Mason and Joan Robinson established the framework of Structure, Conduct, and Performance Paradigm. The framework was then developed by Joseph Bain in 1959 and was used by the US government to develop antitrust laws (Panhans, 2023).

Industrial Organisation and Antitrust Studies have long focused on industry and market structure and function. Lelissa (2018) explained that the traditional SCP paradigm demonstrates a causal link between a firm's market structure, behaviour, and financial performance. In other words, the SCP paradigm states market environment has a short-term direct relationship with market structure, and firms' conduct is determined by market structure the collective actions ultimately lead to the industry's overall performance (Bain,

1968).

Furthermore, Bain (1959) also emphasised the importance of the entry barriers concept in the SCP paradigm, which constitutes a crucial link between industry structure and performance by referring to it as product differentiation, capital requirement, economies of scale, and absolute cost of advantages due to market power. However, Demsetz (1973) argued that market concentration results from firms achieving greater efficiency over their rival and not due to market power or entry barriers.

The SCP model analyses the structure of an industry to discover effective strategies for increasing production, differentiating oneself from competitors, and generating long-term profitability. Muazu et al. (2013) stated that the SCP framework is widely embraced for assessing competitive sectors attributed to its focus on how the structure of an industry affects firm conduct and performance. However, many researchers have expressed concerns about the endogeneity issue embedded in the traditional SCP paradigm as a unidirectional relationship between structure, conduct, and performance.

As research into industrial organisation progresses, the modified SCP paradigm has emerged to propose a multidirectional relationship among market structure, conduct, and performance, which can be considered endogenous (Muazu et al., 2013). Besides that, another significant improvement on the modified SCP paradigm is incorporating public policies on taxation, subsidies, international commerce, investment, and other economic concepts, which were found to have multidirectional relationships within all the elements (Mishra & Vikas, 2010; Mann & Scherer, 1971).

Market structure in the SCP paradigm can be categorised into perfect competition, monopoly, monopolistic, and oligopoly markets. Numerous factors influence the structure of

a market, including the number and size distribution of sellers and customers, barriers to entry, product differentiation, vertical integration, and diversification. Market structure changes slowly and can be considered permanent in the short run (Lipczynski et al., 2009).

Conduct refers to the firm's behaviour influenced by the market structure (Lipczynski et al., 2009). Numerous factors can affect how a firm can respond to a given industry to maintain its competitive position, such as pricing strategies, product differentiation, advertisement, and mergers. However, not all are necessarily done by just being competitive; instead, the firm can also collude to maintain its current position (Martin, 1988).

Market performance is often measured by profitability, technological advancement, growth, and quality of products and services (Lipczynski et al., 2009), and it is a result of the firm capability to implement various business strategies to compete and dominate the market. As described by Carlton and Perloff (1989), market performance can be regarded as the level of market success in producing consumer benefits.

2.6.1 Empirical Review of Industrial Organisation: Structure-Conduct Performance Paradigm

In continuation of the previous section's theoretical review, this section delves into an empirical review of the relationship between market structure, conduct, and performance. It encompasses additional articles associated with the SCP paradigm, which would serve as a metric to reinforce the conclusions drawn from the systematic literature review. This section also explores the causal connection between the elements of SCP and policy regulations. The evolution of the SCP paradigm was examined and elaborated upon within this section.

The structure-conduct-performance (SCP) paradigm is used to conduct an industrial

analysis. Based on the well-known Industrial Organisation (IO) economics, the SCP paradigm investigates how a market functions by identifying the interrelationship of its three components: structure, conduct, and performance (Fu, 2003). The SCP paradigm measures the relationship between the industrial market structure and the factors influencing industrial market conduct that affect market performance (Suciati et al., 2022). By assessing the market condition (structure), firms continue to adopt strategies (conduct) to achieve an optimal level of profitability (performance) (Porter, 1980). Irfan et al. (2019) explained that an industry's competitiveness is inferred by examining its structural features of the industry.

The SCP paradigm was initially published by Çelik and Kaplan (2016) to study how large firms use their market power to influence prices and production levels. In a study, 'Price and Production Policies of Large-Scale Enterprise', Mason argued that government policy is essential in regulating the practices of large firms to encourage competition and to eliminate the abuse of market power by dominant firms. The theory of the relationship between the size of firms, the influence of market power on price and the level of production has become the most influential fundamental in the study of Industrial Organisation Economics, which was later studied by Mason's student (Bain, 1951) and the regulation of the antitrust policy to protect consumers.

The SCP Paradigm was later developed by Bain (1951), who focused on the relationship of market concentration towards the firm's profitability in the manufacturing industry. The method used in this study was cross-sectional regression analysis using the industry data from the Census of Manufacturers. Bain also employed a sample of 99 industries in the United States ranging from 1936 to 1940 with 333 firms. The findings have proven a positive relationship between market concentration and the firm's profitability,

where firms in a more concentrated market with the slightest degree of competition are more likely to earn higher profits.

Furthermore, in the 1980s, economists started to develop the importance of the New Empirical Economic Organisation (NEIO) due to the limitations of the SCP paradigm. The (NEIO) method can combat the limitations of the SCP paradigm by analysing the firms' reactions towards market dynamics (Kadiyali et al., 2001). A study showed that pricing behaviour has a significant impact on consumer behaviour, where bundling of telecommunication services can steer consumers towards paying higher-priced services (Bain, 1951). The author concluded that the probability of consumers switching to other network providers is unlikely for those who are willing to pay for the bundled services and depends on the level of competition in the market and the availability of substitutes. The methods used in this study are based on the NEIO methods that include econometric techniques to estimate the model, including instrumental variables, fixed effects, and simulation-based methods. Supported by another article on estimating market power evidence from the us brewing industry, the author uses the NEIO methods to plot the evidence of market power by developing a structural model, analysing pricing strategies, conducting merger simulations, and estimating market power by employing the Lerner Index. A sample of the US brewing industry from 1986 to 1995 was used in the study, and the data include information on prices, quantities sold, and characteristics of beer brands for 20 cities across the US.

2.7 Underpinning Regulatory Theory on Public Policy and Antitrust

Regulatory Theory on Public Policy and Antitrust plays a vital role in shaping the dynamics of markets and fostering competition within the private healthcare sector. This

theory encompasses the regulatory frameworks, government interventions, and antitrust laws that impact the behaviour of firms and the overall performance of the private hospital industry in Malaysia.

In the context of healthcare, regulatory frameworks are established to ensure fair competition, protect consumer interests, and enhance the quality of healthcare services. Scholars like Robinson (2011) highlighted the significance of regulatory interventions in preventing monopolistic practices and creating a level playing field for all healthcare providers. These regulations aim to maintain a competitive environment where healthcare providers compete based on quality and efficiency rather than engaging in anti-competitive behaviours. Antitrust laws and competition policies, such as those enforced by the Malaysia Competition Commission (MyCC) and the Competition Act of 2010, are essential in regulating market behaviour and preventing anti-competitive practices within the private healthcare sector. Researchers like Stiegert et al. (2009) emphasised the importance of antitrust regulations in ensuring competitive markets and safeguarding consumer welfare. By enforcing these laws, authorities can promote fair competition, prevent market distortions, and protect consumers from monopolistic practices.

The regulatory framework not only influences market structure but also shapes firm conduct and performance outcomes in the private hospital industry. Trish and Herring (2015) demonstrated how factors such as health insurer market concentration and bargaining power with hospitals can impact health insurance premiums, illustrating the intricate relationship between regulatory policies, market dynamics, and consumer outcomes. By understanding and adhering to regulatory requirements, healthcare providers can contribute to a more competitive and consumer-friendly healthcare market.

In summary, regulatory theory on public policy and antitrust plays a pivotal role in ensuring a competitive and well-functioning private healthcare sector by establishing regulatory frameworks, enforcing antitrust laws, and influencing market dynamics to benefit both healthcare providers and consumers.

2.7.1 Empirical Review of Regulatory Theory on Public Policy and Antitrust: Structure-Conduct-Performance Paradigm

The empirical review of regulatory theory on public policy and antitrust within the context of the Structure-Conduct-Performance (SCP) paradigm provides valuable insights into how regulatory frameworks, government interventions, and antitrust laws influence market dynamics and competition in the private healthcare sector. This section delves into empirical studies that have examined the interplay between regulatory theory, market structure, firm conduct, and performance outcomes in the healthcare industry.

Nasir et al. (2023) highlighted the impact of regulatory theory on market structure within the private hospital industry in Malaysia. These studies emphasised how regulatory interventions can shape the competitive landscape, influence market concentration levels, and impact the entry barriers for new healthcare providers. Regulatory frameworks play a crucial role in moulding the competitive landscape, determining market concentration levels, and influencing the barriers to entry for new healthcare providers. Stiegert et al. (2009) and Robinson (2011) explored the influence of antitrust laws on firm conduct in the healthcare sector. These studies discuss how antitrust regulations can deter anti-competitive behaviours, promote fair competition, and encourage healthcare providers to compete based on quality, innovation, and efficiency rather than engaging in monopolistic practices. Antitrust laws serve as a critical tool in deterring anti-competitive behaviours among healthcare providers,

promoting fair competition, and encouraging firms to compete based on factors such as quality, innovation, and efficiency.

Trish and Herring (2015) conducted empirical research on the relationship between regulatory theory and performance outcomes in the private healthcare industry. Their study examines how regulatory frameworks, such as those related to health insurer market concentration, can impact healthcare provider performance, patient outcomes, and overall healthcare quality. By analysing this relationship, researchers can better understand how regulatory interventions influence the performance of healthcare entities and the quality of care delivered to patients, ultimately shaping the outcomes and effectiveness of the healthcare system.

In conclusion, the empirical evidence presented in these studies underscored the critical role of regulatory theory and antitrust laws in shaping market dynamics, influencing firm behaviour, and ultimately impacting performance outcomes in the private healthcare sector. By understanding these relationships, policymakers, regulators, and healthcare stakeholders can make informed decisions to promote competition, enhance quality of care, and ensure the efficiency and effectiveness of healthcare services.

2.8 Underpinning of Game Theory

The underpinning of Game Theory within the context of the Structure-conduct-performance (SCP) paradigm provides valuable insights into strategic interactions, decision-making, and competitive behaviour among players in the private healthcare sector. This section delves into empirical studies that have examined the application of Game Theory to analyse the strategic behaviour of healthcare providers, the impact of competitive strategies

on market dynamics, and the resulting performance outcomes.

Yeung and Makkapati (2023) highlighted the application of Game Theory to analyse strategic interactions and decision-making among healthcare providers. These studies emphasise how Game Theory models can elucidate the strategic choices made by hospitals, physicians, and other healthcare entities in competitive environments, providing insights into pricing strategies, service offerings, and collaborative arrangements.

Sung and Kim (2021) have explored the impact of competitive behaviour on market dynamics within the private healthcare industry. The study utilised Game Theory to analyse how competitive strategies, such as price competition, product differentiation, and entry deterrence, influence market structure, consumer welfare, and the overall competitiveness of the healthcare market (Hermundsdottir & Aspelund, 2021).

Empirical research by Kc et al. (2020) focused on examining performance outcomes and equilibrium analysis using Game Theory in the context of the private healthcare sector. This study investigated how strategic interactions among healthcare providers lead to equilibrium outcomes, the implications for patient welfare, and the overall performance of the healthcare system.

In conclusion, the application of Game Theory within the SCP paradigm can offer valuable insights into the strategic behaviour of healthcare providers, the dynamics of competition, and the resulting performance outcomes in the private healthcare sector. By leveraging Game Theory models, researchers can gain a deeper understanding of the strategic decision-making processes, competitive interactions, and equilibrium outcomes within the healthcare industry, ultimately informing policy decisions and strategic management practices.

2.8.1 Empirical Review of Game Theory: Structure-Conduct-Performance Paradigm

The empirical review of Game Theory within the context of the Structure-Conduct Performance (SCP) paradigm offers valuable insights into strategic interactions, decision-making processes, and competitive outcomes in various industries. Game Theory provides a framework for analysing the behaviour of rational decision-makers in strategic situations where the outcome of one player's decision depends on the decisions of others. In the healthcare sector, Game Theory has been utilised to examine competitive strategies such as price competition, product differentiation, and entry deterrence and their impact on market structure, consumer welfare, and overall competitiveness. Hermundsdottir and Aspelund (2021) have explored how strategic interactions among healthcare providers influence market dynamics and consumer outcomes.

Moreover, empirical research by Kc et al. (2020) focused on analysing performance outcomes and equilibrium in the private healthcare sector using Game Theory. This research investigated how strategic interactions among healthcare providers lead to equilibrium outcomes, affecting patient welfare and overall system performance. By integrating Game Theory models into the SCP paradigm, researchers gained a deeper understanding of strategic decision-making processes, competitive interactions, and equilibrium outcomes within the healthcare industry. This knowledge can inform policy decisions and strategic management practices and enhance the understanding of market dynamics in the healthcare sector. Overall, the application of Game Theory within the SCP paradigm provides a robust analytical framework for studying strategic behaviour, competition, and performance outcomes across industries, including healthcare. Researchers can leverage Game Theory to gain insights into complex market interactions and inform evidence-based decision-making

in competitive environments.

2.9 Underpinning Market Structure Theory on Contestable Markets

The underpinning of Market Structure Theory within the context of Contestable Markets offers valuable insights into the dynamics of competition, entry barriers, and firm behaviour in industries where potential competition influences market outcomes. Market structure theory examines how the structure of a market, including the number and size of firms, affects their behaviour and performance. Chen (2014) and Parshakov et al. (2021) highlighted the application of Market Structure Theory to analyse competition and entry barriers in contestable markets. These studies emphasised how the threat of entry by potential competitors influences incumbent firms' behaviour, leading to competitive strategies and efficiency improvements. Empirical studies by Chen et al. (2016) focused on examining the implications of contestability for regulatory policies within the SCP paradigm. These studies investigate how regulatory interventions can enhance or hinder contestability, influencing market structure, firm behaviour, and overall performance.

By leveraging market structure theory in the analysis of contestable markets, researchers can gain a deeper understanding of how contestability influences market outcomes, firm behaviour, and the overall competitiveness of industries characterised by potential competition. This knowledge can inform regulatory policies, promote competition and innovation, and enhance consumer welfare. In conclusion, the application of Market Structure Theory within the context of contestable markets provides valuable insights into competition, entry barriers, and regulatory implications within the SCP paradigm. Researchers can utilise market structure theory models to understand the interplay between market structure, firm behaviour, and regulatory policies in industries where potential

competition shapes market dynamics.

2.9.1 Empirical Review of Market Structure Theory on Contestable Markets: Structure Conduct-Performance Paradigm

The empirical review of Market Structure Theory within the context of Contestable Markets in the Structure-Conduct-Performance (SCP) paradigm offers valuable insights into the dynamics of competition, entry barriers, and firm behaviour in industries where potential competition influences market outcomes. Roberts et al. (2019) and Smith (2017) highlighted the application of Market Structure Theory to analyse competition and entry barriers in contestable markets. These studies emphasised how the threat of entry by potential competitors influences incumbent firms' behaviour, leading to competitive pricing strategies, innovation, and efficiency improvements. Furthermore, Garcia et al. (2020) explored the impact of contestability on market performance across various industries within the SCP paradigm. These studies utilise Market Structure Theory to analyse how ease of entry and exit affects market outcomes, consumer welfare, and overall competitiveness.

Empirical studies by Liu et al. (2022) and Hermundsdottir and Aspelund (2021) delved into the implications of contestability for regulatory policies in different sectors. These studies investigate how regulatory interventions can either enhance or hinder contestability, influencing market structure, firm behaviour, and, ultimately, market performance.

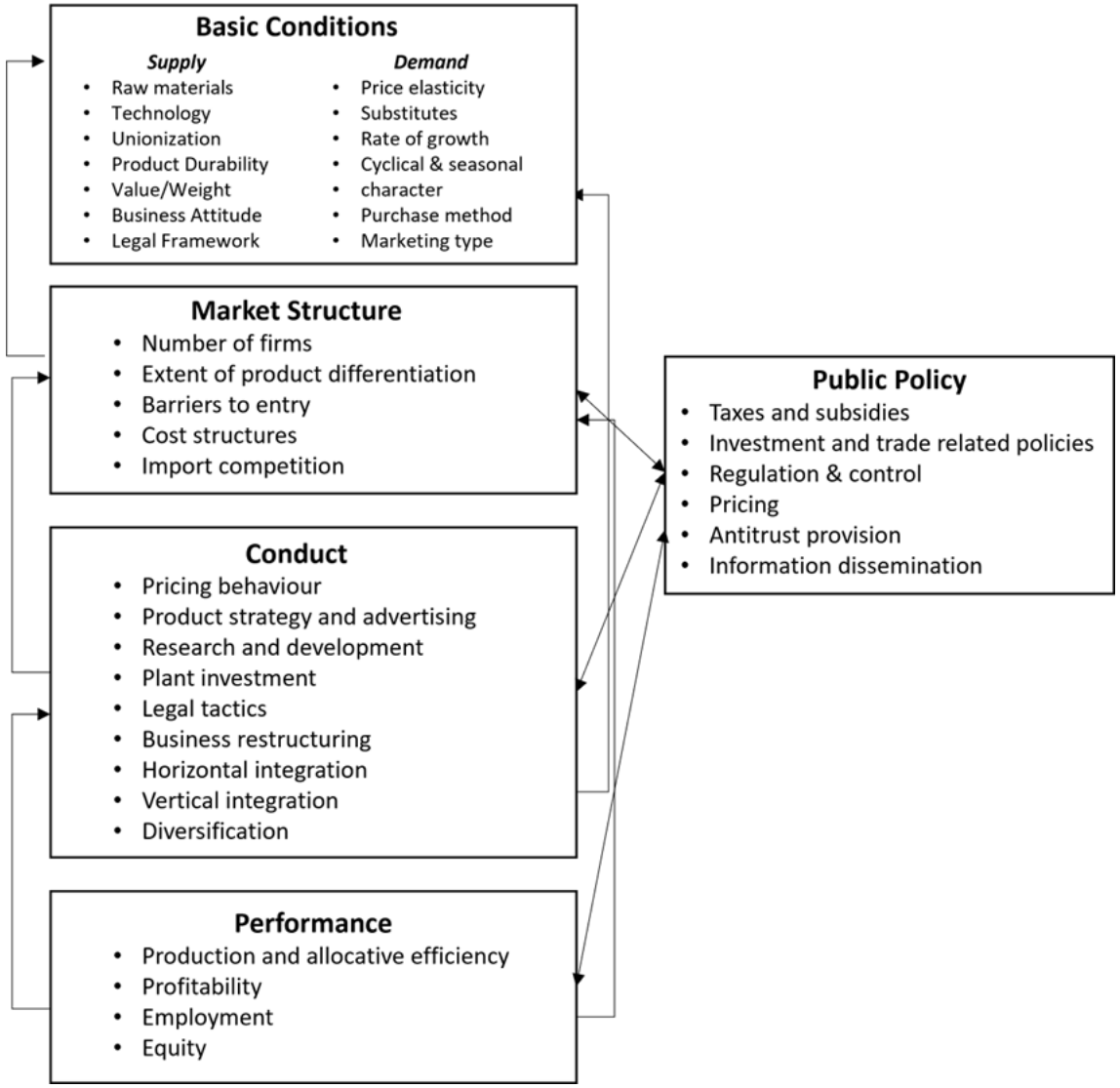
By integrating market structure theory into the analysis of contestable markets within the SCP paradigm, researchers can gain a deeper understanding of how market structure influences firm behaviour and performance in industries characterised by potential competition. This knowledge can inform regulatory policies, promote competition, and

enhance consumer welfare in dynamic market environments.

In conclusion, the empirical review of market structure theory on contestable markets within the SCP paradigm provides valuable insights into the interplay between market structure, firm behaviour, and regulatory implications. Researchers can leverage this framework to analyse competition, entry barriers, and market performance in industries were potential competition shapes market dynamics.

2.10 Theoretical Framework of SCP Paradigm

SCP Paradigm (Structure-Conduct-Performance Paradigm) is a conceptual framework in industrial economics used to analyse the relationship between market structure, firm 84 conduct, and firm performance in an industry. This framework was chosen as the main guide in carrying out hypothesis testing and achieving the research objectives of this study. In addition, this framework would provide specific assistance, especially for RO1 and RO3, as it can illustrate the flow and how the characteristics in each element of structure, conduct, and performance can relate to each other.



Source: Mishra & Sahoo (2012)

Figure 2.14: Conceptual Framework

Figure 2.14 shows the concept of SCP Paradigm, which posits that with the increase in competition, there will be less competitiveness in an industry if only some companies are involved in the production who own significant portions of the market share; thus, the market is considered concentrated. According to the structure-performance hypothesis, market

concentration increases collusion among companies. Hence, it is hypothesised that market concentration and competition are inversely related; in other words, the traditional SCP paradigm asserts that the degree of market concentration is closely correlated with the level of solid competition (Shaik et al., 2012).

In this study, panel regression was chosen to test each of the elements in the SCP paradigm, such as market structure, firms' conduct and firms' performance. The framework has been widely utilised to empirically examine the SCP model (Mishra & Sahoo, 2012; Tung et al., 2010).

SCP paradigm is often used in accessing an industry's competitiveness by looking into the market's concentration by analysing the number of firms and their market share (Muazu et al., 2013). Instead of employing the concentration ratio, the present research relied on the Herfindahl-Hirschman Index (HHI) model to determine the degree of market concentration of the private hospital industry in Malaysia; the concentration ratio has been criticised because of its lack of heterogeneity in how it allocates market share across firms present in the market.

2.11 Market Structure

A market can be categorised by measuring several indicators, such as the degree of product differentiation, barriers of entry, number of firms, and the firm's level of price control (Eronmwon et al., 2014). A market structure is an indicator market players use to plan their strategies that determine the collective performance of the firms in the industry (Luo, 2014). Besides, market structure refers to the nature of competition in a market, influenced by factors such as the number and size distribution of buyers and sellers, barriers to entry, and product differentiation (Caves, 1980). The design of market structures can be approached

through a component-based specification, which considers market microstructure, infrastructure, and business structure (Mäkiö, 2004). Knight and McGee (2015) mentioned that market structure can range from perfectly competitive to monopolistic, with implications for market conduct and performance. Also, efficient market structures are those that enable price competition with transfers and yardstick price caps (Yang, 2021).

Porter (1980) explained that the strategic planning of the firm depends on the fundamentals of market structure analysis. In other words, SCP infers that the organisations act in response to market structure to achieve favourable profits (Yuen et al., 2020). The performance of the firms is positively correlated with the concentration of the market structure as suggested by the traditional SCP framework that the two components of SCP possess the probability of collusive behaviour.

In the case of private hospitals in South Africa, the increased level of market concentration is often associated with the various approvals for hospital mergers, as market concentration is measured by the number of market shares owned by the firms in the private hospital industry (Erasmus, 2016). The study found that the market of the private healthcare sector is classified as a highly concentrated market, with two dominant firms holding half of the market share. This has reduced the degree of competition in the market as small players were struggling to compete due to limited access to economies of scale, limited financing, and regulatory barriers.

The concentration of a market is often measured using the HHI method, where the market is classified into three types of market structure: unconcentrated market (monopolistic competition), moderately concentrated market (oligopoly), and highly concentrated market (monopoly). Due to mergers, unconcentrated markets (monopolistic

competition) are less likely to have negative competition impacts. Mergers resulting in moderately concentrated markets (oligopoly) often create competitive concerns that require critical observation. Finally, mergers that result in highly concentrated markets (monopoly) may significantly create a competitive landscape and often warrant scrutiny. Persuasive evidence demonstrating that the merger is unlikely to increase market power may be used to refute the presumption (Horizontal Merger Guidelines, 2015).

Bain (1951) suggested that the unconcentrated market has an atomistic structure in which there are a lot of small firms with the absence of economies of scale. As the unconcentrated market (monopolistic competition) has a minor concern of competition, there are also fewer barriers to entry, as indicated in a study on the coffee processing industry in Palembang and Pagar Alam Cities, as the competitors in the market have limited meaningful numbers of market shares (Relawati et al., 2018). The author concluded that the coffee processing industry in Palembang and Pagar Alam Cities is highly competitive because the existing firm competes to earn market shares and profits. However, there are relatively low barriers to entry in monopolistic markets, and the study suggested that an unconcentrated market will encourage competition by increasing product quality and market share (Lubis et al., 2022).

The share controlled by the firms in the moderately concentrated market is relatively small compared to the highly concentrated market (Bain, 1951). A study on the market concentration of the Indonesian apple fruit market was conducted by Relawati et al. (2018) at the farmers' and wholesalers' levels, where the study found that the market concentration is both oligopolistic at the farmers' and wholesalers’ levels. The author also concluded that the market concentration of the wholesalers is moving more toward oligopoly

in comparison to the farmers, as the market concentration of the wholesalers is more concentrated and is more influential in the price making of the apple fruit market. An oligopolistic market tends to create barriers to entry for new firms where large firms often have economies of scale. This means that there are cost disadvantages for new entrants, and this makes it difficult for new and small firms to achieve the optimal level of efficiency compared with large-scale firms. In the case of Thailand's maize seed market, the government policy supports both large-scale firms to induce competitiveness. Large-scale firms benefit from biotechnology, while small-scale firms are supported through plant breeding (Napasintuwong, 2020).

The Malaysian pharmaceutical industry has been categorised as a highly concentrated market (monopoly) continuously over some time. It continued to grow in an upward direction from the year 2014-2012 with a sample of 41 pharmaceutical firms. This has created collusion between the pharmaceutical manufacturers, which results in unofficial mergers to reduce the level of competition in the market. An assessment conducted by Chong and Chan (2014) on the Market Structure and Competition in the Malaysian pharmaceutical industry also implied the lack of customer bargaining power that enables large corporations to charge higher prices for pharmaceutical and medical drugs to increase their profits. The practice of anticompetitive through the 2010 Competition Act has created barriers in the market, causing small and medium-scale manufacturers to fail to compete with large-scale manufacturers.

As for most banking industries, present studies indicate that most central banks enjoy monopoly market power and decrease the degree of competition in the market. To induce competition among private industry, the government usually implemented policies

such as deregulation of interest rates, tightening prudential controls, and increasing the central bank's capacity to improve the entry level for private banking entities. A study on the Bangladesh banking industry found that the market is highly concentrated due to the HHI analysis of 46 banks over the period 2005-2014 (Shair et al., 2019). The author concluded that a highly concentrated market led to decreased competition due to several factors, such as barriers to entry and difficulty in competing with well-established significant banks that own large market shares in the market.

A highly concentrated market usually consists of a few dominant forms, making the market more competitive compared to an unconcentrated market and a moderately concentrated market (Muazu et al., 2013). According to Bain (1951), there are a small number of firms that control a very significant amount of industrial output.

To maintain a sustainable performance in the competitive healthcare industry, private hospitals in Malaysia must constantly review their performance by re-evaluating the hospital's processes, culture, and structures (N. Mohammed et al., 2019). In the article “How Private Hospital Competition Can Improve Canadian Health Care”, the author argued that competition can be an indicator to improve the quality and efficiency of healthcare services. The study also concluded that a market-driven approach could help induce competition, and simultaneously promote improved quality and efficiency in the healthcare industry (Zelder, 2021).

Another finding from Berden (2019) also concluded that competition in the private hospital market significantly impacts the quality of care and cost efficiency. The author concluded from the analysis of 89 Dutch hospitals that face greater competition tend to deliver a more outstanding quality of care, which results in a low mortality rate and lower

cost per patient.

However, a study found no significant relationship between market structure and performance in the Fried Onion SME market if a practice of anti-competitiveness is implemented, as anti-competitiveness practices limit the firms' drive to compete and increase their profitability (Suciati et al., 2022). This shows that the SCP components are not directly related to each other, but policies implemented by the government may impact the outcome.

The study uses the Herfindahl-Hirschman Index (HHI) and Market Share (SHAREit) to measure market concentration and market share in the private hospital industry in Malaysia. The HHI is a commonly used measure of economic market concentration that calculates the sum of the squares of the market shares of all firms in a particular market (Jumono et al., 2019). The resulting number from the study by Kroupová et al. (2022) ranged from zero to 10,000, with higher numbers indicating a higher degree of market concentration. HHI was used in this study to measure the degree of market concentration in the private hospital industry in Malaysia.

Market share (SHAREit) was measured by the ratio of private hospital revenue to the total revenue of all private hospitals in the industry and expressed as a percentage of the total market (Khan & Hanif, 2018). The study used SHAREit to measure the market share of individual private hospitals in the industry. By using HHI and SHAREit, the study provided a comprehensive analysis of market concentration and market share in the private hospital industry in Malaysia, allowing for a better understanding of the competitive dynamics of the industry and its impact on hospital performance (N. Mohammed et al., 2019).

The present study sits within the context of existing research that has employed the

Herfindahl-Hirschman Index (HHI) and Market Share (SHAREit) to investigate market structure and competition. Notable contributions to this field include the works of Kroupová et al. (2022), Arif and Firmansyah (2021), N. Mohammed et al. (2019), Camino-Mogro and Bermúdez Barrezueta (2019), Jumono et al. (2019), Tan et al. (2017), Gavurova et al. (2017), Khan and Hanif (2018), Mukhopadhyay and Chakraborty (2016), N. Mohammed et al. (2015), Poquiz (2015), Sung (2014), Setiawan et al. (2012), Liebenberg and Kamerschen (2008), and Molyneux and Forbes (1995). These studies have employed similar methodologies to assess market structure and competition using HHI and SHAREit, contributing valuable insights to the understanding of various industries and market dynamics.

2.12 Market Conduct

Market conduct usually refers to the firm's course of action in response to the market condition. Market conduct can be defined as the behaviour of firms with substantial market power, with a focus on its effect on competition and the presence of a business rationale (Corones, 2002). This behaviour is influenced by the legal, institutional framework within which markets operate (Vanberg, 2001). Market behaviours are also influenced by rational and ethical aspects (Avtonomov, 1997) and operate as a definitional practice in price-setting markets, with participants engaging in interactive, interpretive behaviours (Smith, 2007).

A firm's advantage is associated with acquiring and exploring valuable resources under the industry's market structure. The SCP framework for individual firms examines behavioural variations along the critical business processes, from the selection of the firm's products and markets to the sourcing of its raw materials and internal auxiliary operations when appropriate. De Figueirêdo et al. (2014) explained that the extended SCP framework

suggests a few critical indicators for market conduct, which include pricing behaviour, product and advertising strategy, plant investment, research and development, and vertical and horizontal linkage.

Begum (2018) explained that the components of the market structure, new entrants, can be blocked by implementing entry deterring price. Entry-deterring price is a pricing strategy used to discourage the entry of new firms into the market. By executing this pricing strategy, incumbent firms continue to dominate the market by lowering the price of the products, thus causing new entrants to suffer from losses and low profit margins. In the Thailand Maize Seed Market, some companies also tend to lower their prices during drought season to earn market share and profits by offering discounts to dealers based on the sales volume (Napasintuwong, 2020).

In a study conducted in the Indian banking industry, the bank's profitability mostly depends on its selling and advertising efforts. Advertising plays an important impact on a bank's financial performance as it enables banks to differentiate their products and services from the products of their rival. Advertising efforts can be associated with both market conduct and market performance, as they can create barriers to entry and help enhance the bank's image. The advertising strategy helps banks gain market share and deter new entrants from competing, which in turn contributes to the improvement of its financial performance (Mishra & Vikas, 2010).

The initial investment is also another indicator linked to the entry and exit barrier due to its high cost. Some industries that require advanced technologies, like the maize seed market, need a significant investment. Multinational companies seem to have a better advantage in terms of access to capital and a more significant collection of genetic materials

than small companies in the seed market (Napasintuwong, 2020).

Supported by the case of Private Healthcare in Malaysia, the investment in new facilities and equipment has led to improved quality of care along with the tax incentives granted to the private healthcare sector. In this case, it is shown that the causal relationship exists in the SCP paradigm, where the public policy has contributed to the ease of plant investment which in turn contributed to improved performance (Rasiah et al., 2009).

Kadir et al. (2014) showed that the banking industry has also invested in technology to enhance customer experience through online banking platforms and other fintech solutions. By employing the latest technological advancements, firms usually could increase their market share and profitability.

Vertical linkage refers to governance firms' practice in a particular market to improve effectiveness and efficiency by encouraging explicit coordination. However, the vertical linkage studied in the US healthcare system shows increased prices and health spending when the patient pays a physician visit due to the additional billing fees incurred on outpatient services and physicians making referrals to other high-priced providers (Godwin et al., 2021).

In the case of the Thailand maize seed market, the large seed companies are supported by the government program and their business link with the feed manufacturers while leaving other small-scale companies with no access to the same integration benefits (Napasintuwong, 2020).

Malaysia's healthcare industry has shown a vertical linkage between government and private healthcare in Malaysia. To deliver a substantial improvement in healthcare

services, the government has established a partnership where private hospitals were contracted to provide certain services to public sector patients (Rasiah et al., 2009).

Horizontal linkage can be observed in a study on market concentration trends in South Africa's private healthcare sector, as the concentration from 2000 to 2003 shows an increasing trend. The increasing concentration level is seen because of mergers and the implementation of anti-competitiveness practices to dominate the share of medical schemes exclusive to three significant providers in the industry to eliminate competition. The findings showed a positive relationship between the market concentration of medical schemes and the private hospital industry in South Africa.

Robinson (2011) concluded in his study that market concentration is associated with high prices of procedures and surgeries in the hospital. The author argued that hospitals with high market concentration tend to have higher profit margins, thus causing the procedures conducted in the hospitals to be expensive.

Contrary to a study of the Massachusetts healthcare market, the author concluded that there is a negative relationship between market concentration and pricing behaviour, as the study found that there is price discrimination between patients with private insurance and those who have Medicare. The author suggested that this pricing behaviour may result from market power, where hospitals in more concentrated markets have greater bargaining power with private insurance companies and can charge higher prices (Seaborne, W., 2021).

The study used Capital Intensity (CAPit) to measure the amount of capital required to generate revenue in the private hospital industry in Malaysia. CAPit is calculated by dividing the total assets of a company by its annual revenue. Mishra and Sahoo (2012) mentioned that a high capital intensity ratio indicates that a company requires a large amount

of capital to generate revenue. This may be due to the need for expensive equipment, infrastructure, or other fixed assets. Thus, CAPit was used to measure the capital intensity of individual private hospitals in the industry.

By using CAPit, the study can provide insights into the capital requirements of private hospitals in Malaysia and how it affects their performance. This allows for a better understanding of the relationship between capital investment and hospital performance in the industry. Mishra and Sahoo (2012) conducted a noteworthy study employing Capital Intensity (CAPit) as a key variable to examine industry dynamics.

2.13 Market Performance

Performance is the outcome of work that is influenced by an industry's structure and behaviour, and the typical outcomes are measured by a company's market share or its profits relative to the industry (Lubis et al., 2022). Market performance is a multifaceted concept encompassing various criteria, such as production efficiency, technological progressiveness, and profit rates (Gibbons, 1970). It is influenced by market orientation, with perceptions of traditional competitors playing a significant role (Perry, 2002). Performance metrics, including financial and non-financial indicators, are crucial for monitoring and guiding corporate management (Garbelli, 2008). A dynamic measure of market performance, the Index Sales Unit Market Performance (ISUMP), has been proposed, considering sales volume, market share, and profit variations (Darmon, 2013).

Bain (1951) concluded that firms in the highly concentrated market tend to generate higher profitability than those in the least concentrated market. Market performance analysis shows how markets reach ideal or desired outcomes, such as the predictable transmission of low and stable pricing (Fama, 1970). Kumar and Choudhary (2019) explained that

performance is measured by how well the firms can produce the right product in the right quantities. A productive and efficient pricing and output combination is derived from firms that maximise profits by equating price and marginal cost.

The current study also implies that the concentration of the market structure influences the performance of the firms within the industry (Mishra & Sahoo, 2012). Profitability is the most common indicator to measure a firm's performance. It was concluded that the more concentrated the market, the higher the potential for the firms to earn higher profits. According to Bain (1951), the concentration of industries positively correlates with average business profitability. This suggested that collusion occurs due to concentration and that colluding businesses set monopolistic prices that are higher than the level of competition. Hence, in a very concentrated market, industries display market power. Hence, greater market concentration causes a more significant collision, which in turn causes competition to decline. To sustain increased profitability, entry barriers must also exist in addition to concentration.

The performance of firms requires an assessment of how firms usually allocate and distribute available assets and resources within their market. The SCP focuses on how the firms misallocated available resources by setting up prices to be higher than the marginal cost of production (Wood et al., 2021).

However, the Chicago School raised concerns about consumer welfare by enforcing the antitrust policy from the 1970s onwards, led by Judge Bork. The consumer welfare standard advocated by Greg Warden is classified into two conditions. The practices are directly associated with competition and are strictly prohibited in a sense where firms alter prices due to the presence of market power. Another condition where the practices do not

impair competition is when competition does not exist, even if the practice decreases customer surplus (Wilson, 2019).

In the case of Private Healthcare in Malaysia, 29 private clinics were closed by the Ministry of Health Malaysia in 2007 due to various offences linked to overly profit-driven behaviour. These private healthcare providers charged high prices and conducted unnecessary tests and consultations. This incident has shown the failure of these entities to allocate resources efficiently (Rasiah et al., 2009).

Private healthcare performance is often measured in quality, equity, and efficiency. Policy interventions, including public-private partnerships and regulation, can improve the private sector's performance in healthcare provision. They also ensure that private-sector healthcare services contribute to achieving universal health coverage goals (Morgan et al., 2016).

In a study conducted on hospital market concentration, pricing, and profitability, the author found a positive correlation between market concentration, pricing, and profitability of the hospitals. It is found that a highly concentrated market has a higher profit margin to provide a more intensive service, thus contributing to increased profitability (Robinson, 2011).

Supported by Sminia (2017), the author concludes that hospital market concentration is associated with higher hospital service prices. The author also found that the relationship between pricing and market concentration is more robust in markets with high insurer concentration. To find the relationship between the insurance and hospital markets, the author conducted an HHI index analysis for both the insurance and hospital markets.

On the other hand, in a study conducted on market structure and insurer bargaining, the author found that insurers in a more concentrated market tend to lead to lower prices as compared to hospitals in a highly concentrated market, which often leads to higher prices (Trish & Herring, 2015).

The study used Return on Sales (ROSit) and Return on Assets (ROAit) to measure the profitability and efficiency of private hospitals in Malaysia. ROSit is a valuable metric for evaluating a company's profitability because it provides insight into its ability to generate operating profits from its revenue without considering the impact of interest expenses or taxes (Khan & Hanif, 2018). A high ROSit ratio indicates that a company is generating solid profits from its core operations relative to its revenue. Thus, the study used ROSit to measure the profitability of individual private hospitals in the industry (N. Mohammed et al., 2019).

ROAit, on the other hand, measures a company's ability to generate profits from its assets. Arif and Firmansyah (2021) found that a high ROAit may indicate that a company is able to generate strong profits from its assets despite facing intense competition. The study used ROAit to measure the efficiency of individual private hospitals in the industry.

By using ROSit and ROAit, the study can provide insights into the profitability and efficiency of private hospitals in Malaysia. This allows for a better understanding of the financial performance of private hospitals in the industry and how it affects their competitiveness (Kroupová et al., 2022).

Studies that have utilised Return on Sales (ROSit) and Return on Assets (ROAit) as integral variables in their research include Mishra and Sahoo (2012), Kroupová et al. (2022), Arif and Firmansyah (2021), N. Mohammed et al. (2019), Camino-Mogro and BermúdezBarrezueta (2019), Tan et al. (2017), Gavurova et al. (2017), Khan and Hanif

(2018), Mukhopadhyay and Chakraborty (2016), Çelik and Kaplan (2016), and Molyneux and Forbes (1995). These studies employed ROSit and ROAit to investigate various aspects of market performance and financial dynamics within their respective contexts. By incorporating these financial indicators, these studies contributed to the understanding of how return on sales and return on assets influence the overall economic performance and profitability of industries across different sectors and time.

2.14 Literature Gap

This study addresses the literature gaps; the SCP paradigm has been extensively utilised in diverse industries and across both developed and developing nations. However, inadequate attention has been paid to the private hospital industry, especially in developing countries; most of the literature in Table 2.4 focuses more on the banking industry, such as Çelik and Kaplan (2016), Deltuvaitė et al. (2015), Gavurova et al. (2017), Jumono et al. (2019), Khan and Hanif (2018), Lloyd-Williams et al. (1994), N. Mohammed et al. (2015), N. Mohammed et al. (2019), Molyneux and Forbes (1995), Prasad and Ghosh (2007), Rakesh et al. (2015), and Tan et al., (2017).

Recent studies have identified a gap in examining the relationship between market concentration and competitiveness in the private hospital industry in Malaysia. Using the SCP paradigm, further research is needed to assess the necessity for healthcare policy and regulations that promote healthy competition among private hospitals. Similarly, more research is needed on the factors impacting market concentration outcomes and to analyse the effects of market concentration on healthcare providers by exploring the strategies employed by firms at different levels of market concentration (Nasir et al., 2023).

Additionally, more research on the impact of market structure on healthcare

outcomes is needed. Competition can effectively drive down costs and improve quality, but it may only be effective in some market conditions. More research is needed to understand how different market structures impact the effectiveness of competition and incentives in healthcare.

A study was conducted to analyse the relationship of market structure, conduct, and performance in hospitals also suggested a need to analyse the impact of policies towards hospitals' structure, conduct, and performance as the policy is needed to avoid monopolies in the market. Hence, the role of policy regulations in regulating the market was further analysed in this study (Robinson, 2011).

Besides that, most of the methods discussed are more towards traditional SCP, and many economic theorists have voiced concerns about the endogeneity problem that plagues the traditional SCP's one-way relationship between structure and, conduct and performance. Thus, there are new approaches that extend the traditional SCP paradigm to include public policies and suggest that there is a multidirectional relationship, hence making the three elements endogenous (Stiegert et al., 2009). Lastly, most research that examined the relationship only focused on the correlation between the three elements of the SCP paradigm; less attention is put on analysing the causation relationship. There is also limited research on the relationship between policy interventions and the three elements of the SCP paradigm.

2.15 Hypothesis Development

2.15.1 Market Structure and Medical Inflation

The private hospital industry in Malaysia has been impacted by concerns surrounding the high costs of medical services, with medical inflation being a growing concern for consumers. The market structure of the industry, as measured by the Herfindahl-Hirschman Index (HHI), is expected to have a significant influence on medical inflation trends. Therefore, it was hypothesised that market concentration, as indicated by the HHI, would positively influence medical inflation in the private hospital industry in Malaysia from 2002 to 2021. Additionally, changes in market structure from monopoly to monopolistic competition, as indicated by the HHI values, are expected to have a significant impact on the trend of medical inflation in Malaysia. The level of competition in the private hospital industry, as influenced by market structure, is also expected to have a significant impact on the pricing behaviour of private hospitals in Malaysia, leading to changes in medical inflation. Finally, it is hypothesised that the relationship between market structure and medical inflation in the private hospital industry in Malaysia is bidirectional, with changes in medical inflation also influencing market structure and competition dynamics.

Erasmus (2016) and Pany et al. (2021) supported the notion that the market concentration and pricing behaviour of hospitals are influenced by market power and competition levels, and they play a significant role in driving medical inflation. Building on this perspective, it is hypothesised that market concentration, as measured by the Herfindahl-Hirschman Index (HHI), positively influences medical inflation in the private hospital industry in Malaysia from 2002 to 2021. Moreover, changes in market structure from monopoly to monopolistic competition, as indicated by the HHI values, are expected to have

a significant impact on the trend of medical inflation in Malaysia. However, contrasting views may arise from authors who argued against a direct causal relationship between market structure and medical inflation, suggesting that other factors beyond market concentration may also contribute to rising healthcare costs. Therefore, while some authors align with the hypothesis that market structure influences medical inflation, there may be dissenting opinions regarding the extent of this influence and the presence of other contributing factors.

2.15.2 Relationship between Market Structure, Conduct and Performance

Drawing on the research findings of Erasmus (2016) and Pany et al. (2021), who suggested that market concentration and pricing behaviour of hospitals play a significant role in driving medical inflation, it has been hypothesised that the market structure, as measured by the Herfindahl Hirschman Index (HHI), influences medical inflation in the private hospital industry in Malaysia. Specifically, higher levels of market concentration, indicated by elevated HHI values, are expected to be associated with increased medical inflation due to reduced competitive pressures and the potential pricing power of hospitals. Conversely, lower levels of market concentration, reflecting a more competitive market structure, are anticipated to be linked to lower medical inflation rates as competition drives efficiency and cost containment.

However, contrasting views from authors such as Lu et al. (2020) and Kalcheva et al. (2018) suggested that while market structure may play a role, other factors like regulatory policies and technological advancements also significantly impact medical inflation rates, indicating a need for a comprehensive analysis of various determinants influencing healthcare costs in Malaysia. Furthermore, Ashraf and Ong (2021) highlighted the importance of considering the impact of demand-side factors, such as the ageing population

and changing disease patterns, on medical inflation rates, which may interact with market structure and other supply-side factors. Therefore, a nuanced understanding of the complex interplay between market structure, conduct, and performance, as well as other determinants of medical inflation, is crucial for policymakers and stakeholders to develop effective strategies for promoting competition, affordability, and quality in the private hospital industry in Malaysia.

2.16 Chapter Summary

This chapter provided a body of knowledge regarding the SCP paradigm to understand where the field of study is headed and where gaps or contradictions may exist in the existing literature.

The systematic literature review using PRISMA was used to conduct content analysis and to identify the research gap to support the present research. The content analysis summarised the research design, research methodology, and research gaps of past studies, which would support to shape present and future research. The systematic literature review found that there are exposures of the SCP paradigm in the banking industry, insurance industry, manufacturing industry, as well as other relevant industries as reviewed in the SLR, but there are still limited studies conducted on the private hospital industry. Scholars widely use the SCP paradigm to identify the relationship between market structure and competition of firms in the industry.

Furthermore, in the theoretical review section, the theory of establishing the traditional theory and applying the modified theory examines the causal relationship between the elements of the SCP paradigm and the regulation of public policy. Past studies have found that public policy has a causal relationship that impacts the results of firms' Structure,

Conduct, and Performance. At the same time, the empirical review section discussed the relationship between market concentrations, competition, and the causal relationship of the SCP paradigm. It also highlighted the direct relationship between market structure and competition in a market.

To sum up, the literature review section offers the theoretical foundation and research framework necessary for the present study of Malaysia's private hospital industry; it establishes the context, identified research gaps, and informs the research framework for analysing the market structure, conduct, and performance of private hospitals. The insights gained from this literature review will help address the research problem by providing a comprehensive analysis of the current market structure and level of competition in the private hospital industry in Malaysia and examining the relationship between market structure, conduct, and performance. Overall, the literature review serves as a solid foundation for the subsequent chapters and confirms its significance in the current research on the private hospital industry in Malaysia.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This section provides a clear overview of the research design, population, sample of study, theoretical framework of the SCP paradigm, data collection, measurement of variables, and data analysis.

The study's research design discusses the approach employed by the study, the source of data collection, and data analysis techniques. Also, the relevant population of the study is discussed in this chapter, and the time frame of the study is also determined through the population of the study. This allows for greater external validity and the ability to draw meaningful conclusions that can be applied to the target population.

Then, the sample of the study was determined by selecting participants based on specific characteristics relevant to the research question. The method employed in this study specifically aimed to select a particular group of participants who met the predetermined criteria for inclusion.

Finally, this chapter delves into the practical implementation of the literature framework in the context of data analysis, with a focus on addressing the research objectives of this study. Furthermore, an elaboration on the measurement of variables is presented, aiming to facilitate the compilation of comprehensive data essential for conducting subsequenttests and encompassing the research objectives.

3.2 Research Design

Throughout this study, both panel and time series analyses were conducted to comprehensively examine the market structure, conduct, and performance of Malaysia's private hospital industry from 2002 to 2021. This statistical approach is consistently implemented using EViews 12 software, with the secondary data sourced primarily from the Bureau van Dijk (Orbis) database.

The use of the Orbis dataset is appropriate to analyse the effects of firm-specific supplier and customer densities on employment growth at the individual firm level (Behr et al., 2023). Also, Arndt (2023) uses the Orbis database due to its increasing popularity and widespread use in various disciplines, including economics and finance. Garcia-Bernardo et al. (2023) mentioned that the Orbis database has provided comprehensive information on companies since the mid-2000s, making it suitable for estimating effective tax rates (ETRs) across countries and over time.

The quantitative approach is deemed applicable for this study, which seeks to identify and measure the impact of market structure, explore the relationship between market structure and medical inflation, and statistically test the causal relationships between variables. All hypothesis testing, determination of relationships between variables, and the support of existing hypotheses necessitate numerical results. This method is in alignment with the principles advocated by prominent researchers Bryman (2015) and Creswell (1994), as they underscored that a quantitative research design is suitable when researchers aim to collect numerical data for hypothesis testing, measure relationships between variables, or strengthen existing theories.

In pursuit of a comprehensive understanding, this study employs a structured

research design with three interconnected objectives. Objective 1 focuses on utilizing the Herfindahl- Hirschman Index (HHI) to assess market structure and competition within the Malaysian private hospital industry. Building on Objective 1, Objective 2 delved into showing the relationship between market structure (HHI) and medical inflation. A systematic test involving a Cointegration Test was used to assess co-movement, VAR Granger Causality for exploring causation,and the measurement of linear associations. These methodologies provide a comprehensive understanding of how market structure behaviour influences medical inflation in the private hospital industry. Moving forward, Objective 3 scrutinised the causal links between market structure, conduct, and performance. With this, the model estimation was presented to capture the dynamic relationships within all the SCP variables, and the Granger Causality test was carried out as it scrutinised the causal links that shape the conduct and performance within the private hospital industry in Malaysia.

The sample selection process would follow strict criteria, ensuring the consistency and reliability of the analysis results. These criteria emphasise compliance with Malaysian Public Sector Accounting Standards (MPSAS) and Malaysian Financial Reporting Standards (MFRS). During the analysis phase, a range of statistical tests were executed to derive results for the hypotheses. This test encompasses descriptive analyses, Unit Root Test, Var Granger Causality Test, Estimation Models and Granger Causality Test. Overall, this methodology provided an in-depth understanding of the complex relationship between market structure, conduct, and performance in the private hospital sector through a series of careful and comprehensive analytical steps to achieve the objectives of the study.

3.3 Population

The population of interest for this research study comprises all hospitals in Malaysia.

Table 3.1: Total Number of Public and Private Hospitals in Malaysia as of 2022

Year	Public Hospital	Private Hospital
2022	145	209
2021	158	207
2020	156	219
2019	154	250
2018	154	252
2017	154	240
2016	153	216
2015	152	216
2014	150	223
2013	146	252
2012	140	209
2011	138	220
2010	131	217
2009	130	209
2008	130	209
2007	130	195
2006	128	223
2005	122	222
2004	119	218
2003	117	219
2002	116	211

Source: Ministry of Health Malaysia (2022)

Table 3.1 shows the total number of public and private hospitals in Malaysia from 2002 to 2022. According to data from the Ministry of Health Malaysia 2022, there were 354 hospitals in Malaysia as of 2022. Out of the total, 145 hospitals were public, while 209 were private. These numbers indicate that private hospitals have a higher presence in Malaysia's

healthcare sector than public hospitals. The highest total number of hospitals in Malaysia recorded was in 2018, with a total of 406 hospitals, with 154 public hospitals and 252 private hospitals. On the other side, the lowest number of hospitals was in 2007, with a total of 325 hospitals, 130 public hospitals and 195 private hospitals.

The findings by Basu et al. (2012) suggested that there are competitive dynamics between the two sectors, with public funds and personnel being redirected to private sector development. Regarding accessibility and responsiveness, wait times were consistently found to be shorter in private sector facilities compared to public sector facilities. Patients also reported worse hospitality from providers at public facilities (Muhamad et al., 2020). In terms of quality, private sector providers were more likely to violate medical standards of practice and had poorer patient outcomes compared to the public sector. However, the private sector had greater reported timeliness and hospitality to patients (Basu et al., 2012).

Reported efficiency tended to be lower in the private sector, partly due to incentives for unnecessary testing and treatment. Public sector services have a more limited availability of equipment, medications, and trained healthcare workers (Kruk et al., 2018). Basu et al. (2012) suggested that the private sector may not be more efficient, accountable, or medically effective than the public sector. However, the public sector lacked timeliness and hospitality in handling patients. The competitive dynamics between the two sectors need to be addressed to ensure that public sector facilities are not stripped of resources and that skilled healthcare workers are retained in both sectors.

Besides, Lucifora (2023) mentioned that public sector hospitals tend to underperform compared to private hospitals in all countries considered. The results suggested that public ownership is associated with a reduction of about 10% in management scores,

corresponding to approximately a half-standard deviation. Therefore, the study indicates that public hospitals as competitors to private hospitals in the healthcare industry may have a negative impact on management practices.

Therefore, in the context of this research, a purposive sampling selection method was used. The year 2022 was excluded from the study due to the incomplete status of financial reports, which may affect the quality and reliability of the data to ensure that the selected hospitals properly reflect the private hospital industry in Malaysia. After all, they are the only ones who have it (Sekaran and Bougie, 2009). As a result, the research focused on 20 years, starting from 2002 until 2021. This period provides ample opportunity to better detect trends and patterns in the private hospital industry.

3.4 Data Collection

Data collection encompassed the extraction of financial statements spanning from 2002 to 2021. The research sampled a total of 92 private hospitals, obtaining financial and company reports from the Bureau van Dijk (Orbis) and the Consumer Price Index (health) data from the Department of Statistics Malaysia. A 20-year timeframe was selected based on data availability and to facilitate a comprehensive analysis consistent with prior studies. Ultimately, 655 observations were compiled using unbalanced panel data.

This approach is in alignment with the insights from the cited paper 'Challenges in Regulating Private Primary Health Care in Malaysia: Perceptions from Key Informants.' The selected timeframe and methodology address concerns about accessibility, inequity, and quality of care that arise with the increasing number of private medical clinics. By covering 20 years, this research provided a comprehensive exploration of long-term trends, offering valuable insights for policymakers aimed at addressing issues within the healthcare sector.

3.5 Measurement of Variables

This section consists of the variables used to analyse RO1 and RO3. According to Table 3.2, HHI was used to measure the market concentration (RO1), which would be further used to analyse the level of competition in the private hospital industry. For RO3, all variables were employed to examine the causal relationship between market structure, conduct, and performance of the private hospital industry. Furthermore, in addressing RO2, the HHI for each respective year was utilised in conjunction with the CPI (Health) to explore the potential relationship between these variables.

Table 3.2: Measurement of Variables

SCP Element	Variables	Definitions
Market Structure Element	$SHARE_{it} = \frac{REV_{it}}{\sum_{i=1}^{n} REV_{it}}$	REV_{it} represents the sum of private hospital i represents sales revenue in year t, and n is the total number of private hospitals in every year.
Firms' Conduct	$CAP_{it} = \frac{ASSETS_{it}}{REV_{it}}$	$ASSETS_{it}$ represents private hospital i total assets in year t, REVit represents private hospital i sales revenue in year t.
Firms' Performance	$ROS_{it} = \frac{PBIT_{it}}{REV_{it}}$	$PBIT_{it}$ represents the i private hospital's profit before interest and tax in year t, REVit represents hospital i sales revenue in year t.
	$ROA_{it} = \frac{PBIT_{it}}{ASSETS_{it}}$	$PBIT_{it}$ represents the i private hospital's profit before interest and tax in year t, $ASSETS_{it}$ represents private hospital i total assets in year t.

Source: Adopted and modified variables from Mishra & Sahoo (2012)

Further, in the next section, the measurements of variables are discussed, which include Market Concentration (HHI), Market Share (SHARE), Capital Intensity (CAP), Return on Sales (ROS), and Return on Assets (ROA).

3.5.1 Market Concentration (HHI)

The Herfindahl-Hirschman Index (HHI) is a commonly used measure of economic market concentration. It is calculated by summing the squares of the market shares of all firms in a particular market. The resulting number ranges from zero to 10,000, with higher numbers indicating a higher degree of market concentration. Generally, an HHI below 1,500 is considered to indicate a competitive market, while an HHI above 2,500 is considered to indicate a highly concentrated market. HHI is calculated by obtaining the sums of squared market shares of all the firms (Chong & Chan, 2014). To address objective 3, the Herfindahl-Hirschman Index (HHI) was utilised as the primary metric, derived from the formula to assess the panel and Granger causality later.

3.5.2 Market Share (SHAREit)

Market Share (SHAREit) was measured by the ratio of private hospital revenue to the total revenue of all private hospitals in the industry and expressed as a percentage of the total market (Mishra & Sahoo, 2012).

3.5.3 Capital Intensity (CAPit)

The capital intensity ratio is a financial ratio that measures the amount of capital required to generate revenue. It is calculated by dividing the total assets of a company by its annual revenue. A high capital intensity ratio indicates that a company requires a large amount of capital to generate revenue. This may be due to the need for expensive equipment, infrastructure, or other fixed assets. Capital intensity can be measured by dividing the Total Assets of a private hospital, and i, by its Total Revenue (Chong & Chan, 2014).

3.5.4 Return on Sales (ROSit)

Return on Sales is a valuable metric for evaluating a company's profitability because it provides insight into its ability to generate operating profits from its revenue without considering the impact of interest expenses or taxes. As this value represents a ratio and is not in logarithm form, no logarithm transformation was performed on the data prior to conducting the panel regression, thus allowing for both positive and negative values. A high Return on Sales ratio indicates that a company is generating solid profits from its core operations relative to its revenue. In contrast, a low PBIT/Revenue ratio suggests that a company may struggle to generate profits or incur high costs relative to its revenue. ROSit can be obtained by dividing i private hospital's profit before interest and tax in year t with the hospital i sales revenue in year t (Chong & Chan, 2014).

3.5.5 Return on Assets (ROAit)

In a highly competitive market with low entry barriers, a high ROA may indicate that a company can generate strong profits from its assets despite facing intense competition. In a less competitive market with high entry barriers, a high ROA may indicate that a company can generate significant profits due to its market power and ability to control prices. ROA can be measured by dividing the i private hospital’s profit before interest and tax in year t with the hospital i total assets in year t (Chong & Chan, 2014).

3.5.6 Medical Inflation (Health)

Data on medical inflation was collected through Malaysia's Consumer Price Index (Health), obtained from the Department of Statistics Malaysia. As an important aspect of health economics, medical inflation refers to the measurement of how the cost of medical

goods and services changes over time. It is important to note that, for this study, the collection of medical inflation is directly generated from the Department of Statistics Malaysia portal, where it is sufficient and does not require further calculations to be used in the data analysis process.

3.6 Descriptive Test

This study employed descriptive analysis to simplify the datasets used and provide a clear and concise summary of the most important characteristics of the data. The analysis for panel data included mean and standard deviation, correlation coefficients, and cross-tabulations. By employing descriptive analysis, a concise overview of the data can assist in identifying key patterns or trends within the dataset (Washington et al., 2003).

3.7 Herfindahl-Hirschman Index (HHI)

The Herfindahl-Hirschman Index (HHI) is commonly accepted as the definitive standard and is employed by researchers, practitioners, and governmental bodies. Its simplicity in computation, long-standing usage, and incorporation of factors overlooked in more intuitive assessments of competition justify its ongoing utilisation despite its drawbacks. However, the HHI overlooks factors like the geographic dispersion of service providers and service quality, which could potentially mitigate its accuracy. Nevertheless, researchers, as well as the Department of Justice and the Federal Trade Commission, primarily rely on the HHI due to its widespread adoption and the absence of viable alternative metrics (Baker, 2001).

The Herfindahl-Hirschman Index (HHI) is widely used to assess market structure and competition, including in the Malaysian private hospital industry (Hirschman, 1964).

Researchers and antitrust agencies commonly employ HHI as a concentration measure, particularly in hospital market studies, to gauge potential monopoly power (Cowling & Waterson, 1976). Its advantages lie in low data requirements and not needing firm-level variables (Fine & Davis, 1980). However, criticisms highlight theoretical weaknesses, the necessity to define relevant markets, and limitations in capturing the true effects of mergers (Farrell & Shapiro, 1988). Despite these critiques, the HHI remains applicable in the context of private healthcare services in Malaysia due to unique market regulations and the country's healthcare dynamics (Dalmau & Puig, 1997; Gonzalo & González-Rozada, 1997).

The study acknowledges the limitations but argues that the HHI, along with a pertinent framework, provides insights into the implications of mergers in the Malaysian private healthcare services market, considering factors such as production costs, patient welfare, and industry sustainability. Additionally, different variations of the HHI index have been proposed in the empirical literature on concentration, incorporating the bank size distribution as part of their calculation (Adelman, 1969; Kwoka, 1985; Rhodes, 1995). The profitability aspect of mergers in the context of private hospitals in Malaysia may have positive implications for healthcare services and the sustainability of this industry (Roberts, 2014).

Table 3.3: Classification of Market Structure using HHI

Type of Market Structure	Range of HHI
Monopolistic Competition = Unconcentrated	HHI < 1500
Oligopoly = Moderately Concentrated	1500 < HHI < 2500
Monopoly = Highly Concentrated	2500 < HHI

Source: (*Horizontal Merger Guidelines (08/19/2010)*, 2015).

Based on Table 3.3, any HHI value below 1,500 would indicate the presence of a competitive market, while the HHI value above 2,500 would indicate a highly concentrated market. The HHI calculation process was carried out using the steps explained by Chong and Chan (2014). Therefore, through the analysis of the HHI index for each year from 2002 to 2021, a deeper understanding of market movements would be attained. For descriptive and unit root tests, it is crucial to note that the reported HHI values in Tables 4.1 and 4.2 are likely to be different due to variations in the methods and data used for each analysis. The HHI values may be calculated as part of a time series analysis. This involves squaring the calculated values for each year and then summing these squared values to obtain an HHI result for each year, representing the Malaysian private hospital industry. The resulting HHI values typically range from zero to 10,000.

The data set was used in examining the Unit root test, Cointegration test and VAR Granger Causality test. Essentially, the distinction in approaches reflects the different analytical techniques employed and the specific characteristics of the data. Time series data was used for an in-depth exploration of trends and patterns within a single variable, which is HHI, over time. Thus, the dataset of HHI in this test was structured in an annual format. On the other side, panel data analysis facilitates the examination of variations across multiple variables, such as CAP, SHARE, ROS, and ROA, over time. Panel data involves observations gathered from multiple hospitals over various periods, which are then utilised to investigate the dynamic relationships among them. The HHI values used in this context may be derived from a panel dataset, where each hospital has its own set of HHI values over the specified time.

3.8 Market Structure and Medical Inflation

Building on the foundation laid by the first objective, research objective two delved into the utilisation of the Herfindahl-Hirschman Index (HHI) results derived from the initial analysis, in conjunction with Malaysian medical inflation annually, as depicted by Malaysia's Consumer Price Index (Health) from 2002 to 2021. This segment of the study was designed to unravel the intricate relationship between market structure and the fluctuations in medical costs throughout the designated period. To facilitate a robust examination of this dynamic, the analysis incorporated the use of time series data, employing a suite of methodologies including unit root tests to ascertain data stationarity, cointegration analysis to explore long-term relationships, and VAR Granger Causality tests to identify directional influences between market concentration and medical cost inflation.

3.8.1 Unit Root Test

A unit root test is a statistical test used to determine if a time series variable is stationary or non-stationary. Unit root tests provide valuable insights into the dynamics of time series data and enhance the accuracy and reliability of statistical analyses (Eric, 2019). By employing unit root tests, researchers can gain insights into the behaviour and characteristics of the analysed data, which is essential for making informed decisions in various fields such as economics and finance (Baharumshah et al., 2003).

Stationarity is an essential concept in time series analysis, and a stationary time series has a constant mean and variance over time, making it easier to model and forecast (Chong & Chan, 2014). The most used unit root test is the Augmented Dickey-Fuller (ADF) test, an extension of the Dickey-Fuller test. The ADF test allows for the inclusion of lags of the dependent variable to account for potential autocorrelation. The Augmented Dickey-Fuller

(ADF) test is based on the following regression equation:

$$\Delta Yt = \alpha + \beta t + \gamma Y_{(t-1)} + \Sigma\delta i\ \Delta Y_{(t-i)} + \varepsilon t \qquad \text{Equation 3.1}$$

Where ΔYt is the first difference of the time series variable at time t. α is a constant term. β is the coefficient of the time trend (t). Y(t-1) is the lagged level of the time series variable. Σδi ΔY(t-i) represents the coefficients of the differenced lagged values of the variable up to the lag order chosen for the test, and εt is the error term at time t. The ADF test statistic is computed and compared to critical values from the t-statistic table to determine its significance. If the test statistic is less than the critical values, the null hypothesis of a unit root (non-stationarity) cannot be rejected, indicating that the time series variable is non-stationary. On the other hand, if the test statistic is greater than the critical values, the null hypothesis is rejected in favour of stationarity.

3.8.2 Cointegration Test

$$MIt = \alpha + \beta HHI\ t + \varepsilon t \qquad \text{Equation 3.2}$$

$$HHIt = \alpha + \beta MI\ t + \varepsilon t \qquad \text{Equation 3.3}$$

Johansen's cointegration test in data analysis serves as a powerful tool for investigating the long-term relationships among variables, capturing cross-sectional dependence, identifying common trends, and understanding economic dynamics across multiple entities or units over time. When two or more time series are deemed cointegrated, it indicates a shared long-run trend amidst potential short-term fluctuations. By examining the rank and trace statistics provided, the number of cointegrating relationships present in the time series data and the common trends shared among variables. Unlike traditional

cointegration tests that focus on time series data, the Johansen cointegration test is specifically designed for panel data settings, where observations are collected from multiple entities or individuals over time.

3.8.3 VAR Granger Causality Test

After the estimation of the VAR model, the Granger causality test can be conducted to assess the causal relationship between medical inflation and market structure. The predictive performance of models with and without lagged values of one variable on the other is compared, and the Granger causality test determines if past values of medical inflation help improve forecasts of market structure and vice versa (Granger, 1969). The presence of significant coefficients in the Granger causality test indicates the existence of causal links between medical inflation and market structure, thereby shedding light on the direction and strength of their relationship. The general form of a path order VAR model with k variables can be represented as follows:

$$MI_t = \pi HHI_{(t-1)} + \Sigma \alpha_i D_t + \varepsilon_t \qquad \text{Equation 3.4}$$

$$HHI_t = \pi MI_{(t-1)} + \Sigma \alpha_i D_t + \varepsilon_t \qquad \text{Equation 3.5}$$

Where: "MIt" represents medical inflation at a time "t," and "HHIt" represents the Herfindahl-Hirschman Index at a time "t." The terms πMI(t-1) and πHHI(t-1) capture the lagged effects of the respective variables, ΣαiDt includes any deterministic terms, and εt represents the error terms. This formulation encapsulates the dynamic interplay between medical inflation and HHI in your analysis.

Estimating a VAR model involves various methods, including ordinary least squares (OLS) and maximum likelihood estimation. Selecting the appropriate lag order (p) is crucial, and statistical criteria like Akaike Information Criterion (AIC) or Bayesian Information Criterion (BIC) guide model selection. The application of the Vector Autoregression (VAR) model offers a comprehensive framework to examine the impact of market structure on medical inflation in Malaysia from 2002 to 2021.

3.9 The Relationship between Market Structure, Conduct, and Performance in the Private Hospital Industry in Malaysia

In line with Research Objective 3, this phase of the study is dedicated to uncovering the complex relationship between market structure, conduct and performance in the private hospital industry in Malaysia. Specifically, the systematic interrelationships between the Herfindahl-Hirschman Index (HHI), market share (SHARE), capital intensity (CAP), return on assets (ROA) and return on sales (ROS)

3.9.1 Model Estimation

Model estimation is based on the nature of the estimated model's firm-specific effect (λi) and time-specific effect (μi) (Jayaraman & Lau, 2009). The use of panel data models was used to control unobserved heterogeneity and detect effects that may not be seen in analyses using pure cross-sectional data or pure time-series data. The POLS model is preferable for estimating the coefficients in the equations when there are no firm-specific and time-specific effects ($\lambda_i = \mu_i = 0$). It signifies that the companies under study all have an identical intercept. In contrast, if there is simply a firm-specific impact ($\lambda i \neq 0$; $\mu i = 0$), indicating that the intercept varies among firms but not over time, then RE and FE models

are preferable to the POLS model for estimation. Nevertheless, if the differences in the intercepts are genuinely random, then the RE model is preferred for estimation over the FE model. However, if the difference in the intercept is held constant, the FE model's estimated results are superior to those of the RE model.

Market Structure

$$HHI = a_0 + a_1\, CAP_{it} + a_2\, SELL_{it} + a_3\, ROS_{it} + a_4\, ROA_{it} + e_{it} \qquad \text{Equation 3.6}$$

$$SHARE_{it} = a_0 + a_1\, CAP_{it} + a_2\, SELL_{it} + a_3\, ROS_{it} + a_4\, ROA_{it} + e_{it} \qquad \text{Equation 3.7}$$

Firms Conduct:

$$CAP_{it} = b_0 + b_1\, HHI + b_2\, SHARE_{it} + b_3\, ROS_{it} + b_4\, ROA_{it} + e_{it} \qquad \text{Equation 3.8}$$

Firms' Performance:

$$ROS_{it} = c_0 + c_1\, HHI + c_2\, SHARE_{it} + c_3\, CAP_{it} + c_4\, SELL_{it} + e_{it} \qquad \text{Equation 3.9}$$

$$ROA_{it} = c_0 + c_1\, HHI + c_2\, SHARE_{it} + c_3\, CAP_{it} + c_4\, SELL_{it} + e_{it} \qquad \text{Equation 3.10}$$

a. Pooled Ordinary Least Square (OLS)

The concept of equality between cross-sectional data matrices underpins the pooled Ordinary Least Square (OLS) approach, commonly known as the common constant method (Baharumshah & Lau, 2007). The model estimates an overall constant, or intercept a, for all cross sections. For practical reasons, assuming the data set is a priori homogenous, the pooled OLS indicates no discrepancies between the computed cross-sections. Take the equation below as an illustration of a simple linear model with a single explanatory variable.

$$Y_{it} = a + \beta X_{it} + u_{it} \qquad \text{Equation 3.11}$$

Y and *X* variables have subscripts of *i* and *t* for *i* = 1,2,...,N sections and *t* = 1,2,...,T

time periods, respectively. Since neither a and β has a subscript, they are constant throughout time and across measurement units. Some degree of heterogeneity can be implemented in this panel by removing the restriction that the constant a be the same for all cross-sections.

To evaluate the validity of the FE approach, it is necessary to first ascertain whether fixed effects should be incorporated into the model. Standard F-tests may be used to compare the pooled OLS approach with fixed effects. As stated in the null hypothesis, the common constant approach is valid when all constants are the same (homogeneity).

$$H_0 = a_1 = a_1 = a_2 = \cdots = a_N \qquad \text{Equation 3.12}$$

F statistic:

$$F = \frac{(R_{FE}^2 - R_{CC}^2)}{(1 - R_{FE}^2)/(NT - N - K)} \sim F(N - 1, NT - N - k) \qquad \text{Equation 3.13}$$

Where R_{FE}^2 represents the fixed effects model's coefficient of determination and R_{CC}^2 represents the common constant model. The null hypothesis should be rejected if the F-statistic value is larger than the F-critical value.

The constant or intercept is considered group (section) specific in the FE model. Hence, different constants may be employed for each group (section). Thus, FE models account for variation in the cross-section, but pooled OLS does not. The FE estimator is also known as the least squares dummy variables (LSDV) estimator because it uses a dummy variable for each group to apply different constants to each section or group.

b. Fixed Effect Model (FE)

To evaluate the validity of the FE approach, it is necessary first to ascertain whether fixed effects should be incorporated into the model. Standard F-tests may be used to compare

the pooled OLS approach with fixed effects. As stated in the null hypothesis, the common constant approach is valid when all constants are the same (homogeneity).

$$H_0 = a_1 = a_1 = a_2 = \cdots = a_N \qquad \text{Equation 3.15}$$

F statistic:

$$F = \frac{(R_{FE}^2 - R_{CC}^2)}{(1 - R_{FE}^2)/(NT - N - K)} \sim F(N - 1, NT - N - k) \qquad \text{Equation 3.16}$$

Where R_{FE}^2 represents the fixed effects model's coefficient of determination and R_{CC}^2 represents the common constant model. The null hypothesis should be rejected if the F-statistic value is larger than the F-critical value.

The constant or intercept is considered group (section) specific in the FE model. Hence, different constants may be employed for each group (section). Thus, FE models account for variation in the cross-section, but pooled OLS does not. The FE estimator is also known as the least squares dummy variables (LSDV) estimator because it uses a dummy variable for each group to apply different constants to each section or group.

$$Y_{it} = a_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_k X_{kit} + u_{it} \qquad \text{Equation 3.17}$$

c. Random Effect Model

As an alternative to the FE model, the random effects (RE) model can be used to estimate a model. The constants for each section are treated as random parameters rather than fixed values in the RE method, which distinguishes it from the FE approach. To simplify, in the RE model, the constant for each subsection is represented as a deviation from the population's mean. Therefore, the intercept changes between sections because:

$$a_1 = a + V_t \qquad \text{Equation 3.18}$$

The RE model offers an advantage over the FE approach since it requires fewer estimated parameters. Furthermore, it permits the insertion of extra explanatory variables with the same value for all observations inside a set. On the other hand, the RE method has the obvious disadvantage of requiring several assumptions regarding the distribution of the random component. Furthermore, the estimates would be biased and inconsistent if the unobserved group-specific effects were linked with the explanatory variables.

$$Y_{it} = (a + v_i) + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots \beta_k X_{kit} + u_{it} \qquad \text{Equation 3.19}$$

$$Y_{it} = a + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots \beta_k X_{kit} + (v_i + u_{it}) \qquad \text{Equation 3.20}$$

d. Breusch-Pagan test

The Breusch-Pagan test is a diagnostic test that can be used to test for heteroskedasticity in the residuals of a regression model. The test involves estimating a regression model of the squared residuals on the independent variables and testing the null hypothesis that the variance of the residuals is constant across all observations. If the p-value for the Breusch-Pagan test is less than 0.05, then the null hypothesis of no heteroskedasticity is rejected at the 5% significance level, and it can be concluded that there is evidence of heteroskedasticity in the residuals of the regression model. If the p-value is greater than 0.05, then the null hypothesis is not rejected at the 5% significance level, and it can be concluded that there is no evidence of heteroskedasticity in the residuals.

e. Hausman Test

The Hausman test is a statistical test used in econometrics to determine whether a fixed-effects or random-effects model is appropriate for a particular panel data analysis. The Hausman test is used to determine whether the individual-specific characteristics correlate with the other independent variables in the model. If the Hausman test statistic is significant, the null hypothesis is rejected, and the random-effects model is consistent and efficient and uses the fixed-effects model. If the Hausman test statistic is not significant, the null hypothesis cannot be rejected, and the random-effects model is accepted. When the P-value is less than 0.05, we rejected the null hypothesis that the random-effects model is consistent and efficient and concluded that the fixed-effects model is a better choice for the data (Mutl & Pfaffermayr, 2011).

3.9.2 Granger Causality Test

The study employed the Granger causality test, developed by Clive William John Granger in 1969, to explore the effects of changes in the HHI on a company's financial performance, such as ROS and ROA, and how variables CAP and SHARE influence competition dynamics within the Malaysian private hospital industry. The F-statistic measures the causal relationship between variables, indicating whether X Granger causes Y at a particular significance level. The test can be one-sided, examining if X Granger causes Y or vice versa, or two-sided, evaluating if either X or Y Granger causes the other. This approach could address analytical challenges, including issues of instantaneous causality stemming from insufficient or low-frequency data collection, particularly in complex panel data contexts.

Thus, the Granger causality test plays a central role in each of the mentioned

studies, serving as a fundamental methodological tool to explore causal relationships between variables. Chong and Chan (2014) utilised the Granger causality test to investigate whether changes in market structure within the Malaysian pharmaceutical industry can predict fluctuations in market performance. Their analysis aims to discern whether alterations in market concentration or competitiveness precede variations in profitability or market share. Similarly, Porto and Foxall (2019) likely employ the Granger causality test to probe the causal relationship between market share and organisational performance. Through this method, they seek to determine whether historical shifts in market share can forecast subsequent changes in performance metrics, such as financial success or organisational strategy effectiveness.

In essence, the Granger causality test serves as a vital analytical tool in these studies, enabling researchers to uncover potential causal relationships between key variables and deepen their understanding of the dynamics within their respective industries.

3.10 Chapter Summary

Table 3.4: Chapter Summary

Research Objective	Relevance to SCP Concept	Methods Used
Assess market structure and competition within the Malaysian private hospital industry using the Herfindahl-Hirschman Index (HHI).	Structure: HHI is employed to measure market structure and the level of competition in the Malaysian private hospital industry.	Utilisation of the Herfindahl-Hirschman Index (HHI) as a method to gauge market structure and competition.
Explore the relationship between market structure (HHI) and medical inflation using Cointegration Test, VAR Granger Causality, and measurement of linear associations.	Structure and Conduct: The relationship between market structure (HHI) and medical inflation provides insights into how market conduct influences performance.	Unit Root Test: assess whether a time series variable is stationary or non-stationary. Cointegration Test: Identifying co-movement between market structure and medical inflation. VAR Granger Causality: Exploring causation between market structure and medical inflation.
Scrutinise the causal links between market structure, conduct, and performance within the private hospital industry in Malaysia.	Structure, Conduct, and Performance: The study aims to understand the causal relationships between market structure, company conduct, and economic performance in the Malaysian private hospital industry.	Model Estimation: Presenting a model capturing dynamic relationships between SCP variables. Granger Causality Test: Investigating causality between market structure, conduct, and performance.

Overall, this chapter discussed the methodology we adopted to examine this study. It begins by discussing the framework related to the Structure Conduct and Performance paradigm. Following is a description of the data used in this study. The measurement of variables and functional model applied in this study are further explained to better understand the process flow to conduct the analysis. Finally, this chapter covered specification tests for selecting between POLS, FE, and RE estimators and diagnostic tests to arrive at a suitable estimation approach. By integrating the SCP concept into the research methods, this study seeks to investigate how market structure, company conduct, and economic performance interrelate within the context of the Malaysian private hospital industry. The methodology employed is designed to provide comprehensive insights into the dynamics within this industry.

CHAPTER 4

RESULT

4.1 Introduction

In this chapter, the result of the descriptive test is presented. Subsequently, the implementation and detailed presentation of the determined test result, as outlined in the methodology, is reported. This systematic process will bolster the comprehensive analysis of all the research hypotheses, laying a strong foundation to guide the discussion of the research findings in the next chapter.

4.2 Descriptive Statistics

This section provides a comprehensive descriptive analysis of each variable utilised in the static panel data model for the Malaysian private hospital industry. The analysis encompasses various statistical measures such as mean, median, maximum value, minimum value, sum, and normality tests conducted through the Jarque-Bera test. Variables such as the Hirschman Index (HHI), Market Share (SHARE), Capital Concentration (CAP), Return on Sales (ROS), and Return on Assets (ROA) were used to explain market dynamics and firm performance. HHI measures market density, SHARE shows the firm's sales ratio, CAP measures capital dependence, ROS measures sales profits, and ROA measures return on assets. These statistics offer insights into the market characteristics and the performance of firms within the private hospital industry in Malaysia.

Table 4.1: Descriptive Statistics Analysis

	HHI	SHARE	CAP	ROS	ROA
Mean	0.007439	0.028275	1.974361	-0.030759	0.057763
Median	0.000017	0.004222	1.071961	0.077234	0.065927
Maximum	0.418634	0.647019	69.6748	6.735772	1.261423
Minimum	0	0.000007	0.170157	-8.33714	-1.722068
Std. Dev.	0.039592	0.081545	4.537609	0.698433	0.245012
Skewness	7.054958	4.931832	8.857872	-4.03837	-0.95601
Kurtosis	57.4868	29.17825	102.3221	66.67287	12.49995
Jarque-Bera	86457.3	21358.26	277794.2	112427.2	2562.822
Probability	0	0	0	0	0
Sum	4.872474	18.51996	1293.206	-20.1472	37.83461
Sum Sq. Dev.	1.025172	4.348828	13465.79	319.0269	39.26018
Observations	655	655	655	655	655

Notes: HHI = Hirschman Index, SHARE = Market Share, CAP = Capital Intensity, ROS = Return on Sales, ROA = Return

Table 4.1 offers a comprehensive overview of the key descriptive statistics for a dataset, focusing on several pivotal performance indicators within a specific context. The variables, namely "HHI," "SHARE," "CAP," "ROS," and "ROA", were subjected to rigorous analysis, resulting in a rich assortment of statistical measures. These measures encompass crucial characteristics such as mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera statistic, and associated probability. The observations, with a consistent count of 655 across all variables, underscore the uniformity and robustness of the dataset. This result indicates that this lack of data is the result of unpredictable factors and not due to a particular pattern. Each observation represents a distinct data point that contributes to the collective understanding of the examined variables.

Regarding the competitive landscape that appeared diverse, there were notable disparities in financial health and operational efficiency among hospitals. The Herfindahl-Hirschman Index (HHI) has a mean of 0.007439 and a standard deviation of 0.039592,

indicating moderate variability in market concentration among private hospitals. Similarly, the mean for market share is 0.028275, with a standard deviation of 0.081545, suggesting diversity in market presence among these hospitals. The capitalisation (CAP) shows a mean value of 1.974361 and a standard deviation of 4.537609, reflecting varying levels of financial strength across private hospitals. In terms of operational performance, the mean for return on sales (ROS) is -0.030759 with a standard deviation of 0.698433, indicating potential disparities in profitability. The mean return on assets (ROA) is 0.057763, with a standard deviation of 0.245012, highlighting differences in asset utilisation and efficiency.

The median HHI, at 0.000017, is substantially smaller than the mean, indicating a right-skewed distribution, reflecting potential concentration among a few hospitals. Also, the range of values for HHI, from a minimum of 0.000000 to a maximum of 0.418634, confirmed a wide variation in market concentration among private hospitals in Malaysia. This result shows that some hospitals operate in highly competitive environments while others may enjoy significant market dominance. It could be due to the implications of consumer choice and pricing dynamics within the private healthcare sector.

In addition, this variation could reflect differences in hospital size, reputation, and service offerings, influencing their competitive positions and strategic priorities. With the median market share at 0.004222, much lower than the mean, evidence of a right-skewed distribution was detected, highlighting disparities in market share. Also, the diverse market positions held by private hospitals are obviously seen when the range of market share values, from a minimum of 0.00000752 to a maximum of 0.647019. This result showed that some hospitals may have a relatively small market share while others command substantial portion of the market.

Regarding capitalisation, the range of values was recorded from a minimum of 0.170157 to a maximum of 69.6748, Hospitals with higher capitalisation may have greater investment capacity for infrastructure development, technology adoption, and service expansion, potentially enhancing their competitive advantage and ability to attract patients and healthcare professionals. It is fitting to acknowledge that the median capitalisation was recorded at 1.071961, suggesting another right-skewed distribution that hints at differences in financial resources across hospitals.

However, the median ROS exceeds the mean at 0.077234, pointing to a left-skewed distribution. Together with the wide range of ROS values, from a minimum of -8.33714 to a maximum of 6.735772. Negative ROS values may indicate potential operational inefficiencies or financial challenges where cost management and revenue generation strategies could be improved to optimise financial performance and ensure the continued delivery of high-quality healthcare services.

Similarly, with the median ROA slightly higher than the mean at 0.065927, it reinforces a left-skewed distribution, indicating differences in asset utilisation and management efficiency. Likewise, looking at the range of ROA values, from a minimum of -1.722068 to a maximum of 1.261423, it reflected variations in hospitals' efficiency in generating returns from their assets. Hospitals with higher ROA values may demonstrate better asset utilisation and management effectiveness, leading to improved financial performance and long-term sustainability. Again, the disparities in financial resources and investment capacity among private hospitals in Malaysia can potentially hinder smaller hospitals' ability to compete effectively. This may stem from imbalances in market competitiveness, possibly due to the dominance of a few large players in the industry.

Addressing these disparities is essential to foster a more equitable and competitive landscape within the private healthcare sector.

Based on the Jarque-Bera test results, the p-value obtained for each variable (HHI, SHARE, CAP, ROS, and ROA) is less than 0.05, exhibiting non-uniformity and complexity in their financial and operational metrics within the private hospital sector.

Lastly, all these findings are further reinforced with the sum of squared deviations for capitalisation (CAP), particularly standing out, showing variability in capitalisation levels among private hospitals, suggesting varying financial resources, which can impact investments in infrastructure, technology, and staffing. Furthermore, the dispersion in return on sales (ROS) indicates diverse operational efficiencies and revenue generation strategies among hospitals. In addition to capitalisation and ROS, the sum of squared deviations for the Herfindahl-Hirschman Index (HHI) and market share (SHARE) underscores the variability in market concentration and competitiveness among private hospitals. This variability may signify the presence of dominant players in the market, influencing pricing strategies, service offerings, and overall market dynamics. Finally, while some hospitals demonstrate higher ROA values, indicative of effective asset management, others struggle with lower ROA values due to underutilised resources or inefficient operational practices. Overall, these findings highlight the multifaceted nature of private hospital operations and underscore the importance of targeted strategies to address the underlying factors contributing to variability across these metrics.

4.3 Market Concentration (HHI)

The calculation of the Herfindahl-Hirschman Index (HHI) values as a measurement for market concentration that was obtained for each year was conducted. The HHI analysis was carried out specifically to answer the main objective of the study, which is (RO1) to identify the market structure and the level of competition in the Malaysian private hospital industry from 2002 to 2021. The results of the study are as follows:

Table 4.2: Results of Market Concentration (HHI)

Year	Degree of Market Concentration (HHI)
2002	5432.29
2003	5000.00
2004	5003.10
2005	4848.82
2006	5081.76
2007	3286.39
2008	3285.08
2009	3695.95
2010	4808.88
2011	3416.89
2012	1032.00
2013	808.96
2014	811.91
2015	923.33
2016	896.91
2017	834.46
2018	753.56
2019	794.86
2020	914.68
2021	1376.83

4.3.1 Market Structure and the Level of Competition

Referring to Table 3.3, in accordance with the guidelines established by the US Department of Justice and the Federal Trade Commission (2010), the HHI values span from 808.96 to 5432.29, indicating a lower concentrated market. The findings derived from the HHI for the Malaysian private hospital industry between 2002 to 2021.

Table 4.3: Classification of Market Structure using HHI

Type of Market Structure	Range of HHI
Monopolistic Competition = Unconcentrated	HHI < 1500
Oligopoly = Moderately Concentrated	1500 < HHI < 2500
Monopoly = Highly Concentrated	2500 < HHI

Source: (*Horizontal Merger Guidelines (08/19/2010)*, 2015).

The result indicates that a market structure characterised by monopolistic competition was observed from 2012 to 2021, while 2002 to 2011 exhibited a highly concentrated market structure, indicating that the market was somewhat competitive from 2012 to 2021 but also allowed hospitals to differentiate their products and engage in non-price competition to capture market share.

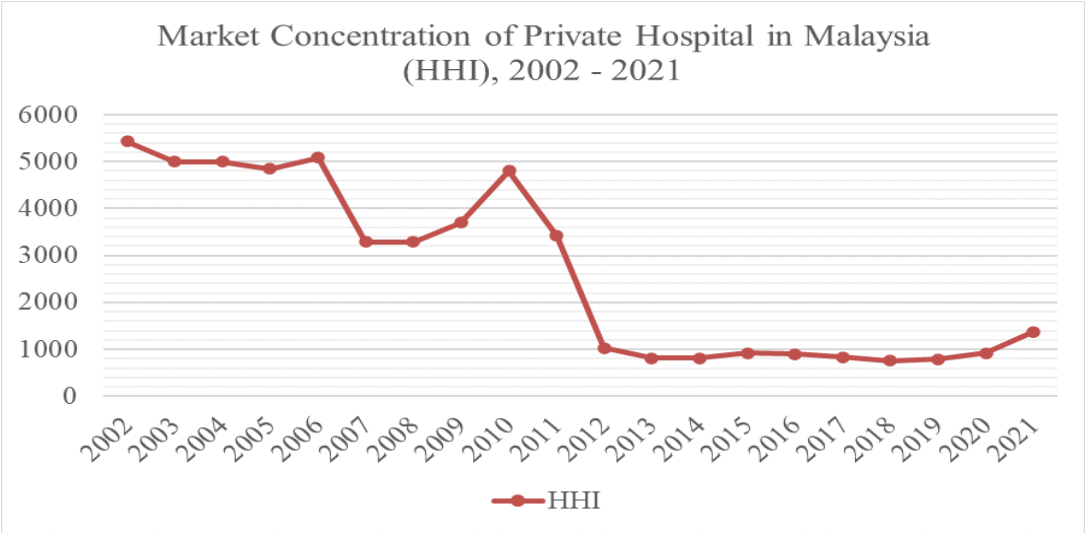


Figure 4. 1: Trend of Market Concentration (HHI) 2002-2021

From Figure 4.1 above, the fluctuation trend occurred from 2002 to 2011 in the HHI values of the Malaysian private hospital industry. The HHI values ranged from a relatively high value of 5432.29 in 2002 to a lower value of 3416.89 in 2011. The fluctuation in HHI values during this period may be attributed to limited data availability. Thus, the calculated HHI values could be influenced by the data constraints, leading to potentially higher values during that time.

Starting in 2012, the Competition Act 2010 came into force, prohibiting anti-competitive agreements and the abuse of dominant positions in the market. This act introduced more comprehensive regulations and oversight measures to ensure fair competition within the healthcare industry and other sectors. The availability of complete data from 2012 onwards allowed for more accurate and robust HHI calculations, reflecting a clearer representation of market concentration and competition in the Malaysian private hospital industry.

In terms of inflation, the healthcare industry in Malaysia has historically experienced higher rates of inflation than other industries. For example, based on the Consumer Price Index for Health in Malaysia, the inflation rate for healthcare was 86.7% in 2002 and increased to 124.1% in 2021. This rate was higher than the inflation rates for other industries, such as food and non-alcoholic beverages, which had an inflation rate of 118.3% in 2021. This increase indicates that the healthcare industry is facing unique challenges that contribute to higher inflation rates, such as rising costs of medical technology and equipment, increasing demand for healthcare services, and an ageing population.

The findings suggested that the Malaysian private hospital industry experienced fluctuations in the Herfindahl-Hirschman Index (HHI) values from 2002 to 2011, indicating varying levels of market concentration and competition during that period. The implementation of the Competition Act 2010 likely played a significant role in influencing market dynamics and regulating competition, potentially influencing the observed changes in HHI values and inflation rates over time. The low level of market concentration in the Malaysian private hospital industry may indicate that competition is healthy, which is in line with the findings of previous studies that have examined the pharmaceutical industry (Chong & Chan, 2014). Similarly, a study by Lubis et al. (2022) found that the industry was highly competitive, which was associated with lower prices, higher levels of patient satisfaction and increased firm performance.

Moreover, the low level of market concentration in the Malaysian private hospital industry suggested that the industry may be operating under a monopolistic market structure, which may contribute to a healthy level of competition. This finding is consistent with the literature on the topic, which suggests that unconcentrated markets resulting from mergers

are less likely to negatively impact competition.

Thus, research objective 1 (RO1) of the study was achieved, and it was concluded that the market was characterised by a monopoly market from 2002 to 2011 and a monopolistic market structure from 2012 until 2022. By identifying the market structure, the study can provide insights into the level of competition in the industry, which can have implications for healthcare policy and regulation. Also, the study suggested that there may be room for increased competition and market entry, which can benefit consumers by improving the quality of care and reducing costs. Therefore, understanding the market structure and level of competition in the private hospital industry is crucial in ensuring that healthcare remains affordable for consumers.

These findings provide valuable insights into the current market structure and level of competition in the Malaysian private hospital industry. These insights can inform policymaking and regulation to ensure that the market remains competitive and that consumers are protected. Furthermore, the findings have relevance beyond the private hospital industry and can contribute to the broader context of healthcare inflation in Malaysia.

4.4 Hypotheses Testing

4.4.1 Market Structure and Medical Inflation

Transitioning to hypothesis 1, an array of analytical methodologies was employed, including Unit Root Test, Cointegration analysis and VAR Granger Causality test. These rigorous procedures were conducted to unveil the long-term effects of the HHI and medical inflation. The outcomes of these analyses are poised to identify the direction of Granger

Causality, shedding light on which variable is exerting a causal influence over the other.

i. Unit Root Test

The unit root test was conducted on two aspects of HHI and Medical Inflation, namely on level and first difference. The test helps to understand the long-term behaviour of a variable and assess whether it has a consistent trend or follows random fluctuations. To examine hypothesis 2, the Augmented Dickey-Fuller (ADF) Unit Root test for a time series is considered stationary at the given level (Rath & Akram, 2021). The ADF test statistic should be greater than the critical value provided by Mackinnon at a 5% significance level. If the result is smaller than the critical value at 5%, then the data needs differencing to achieve stationarity. At this point, the null hypothesis of the ADF test is that there is a unit root, indicating non-stationarity, and the alternative hypothesis is that there is no unit root, indicating stationarity.

Table 4.4: Unit Root Test for HHI

Test Statistics			
	Lag length	ADF Statistic Value $t_{(\mu)}$	5% Mackinnon Critical Value
A: Level			
HHI	0	-1.436155	-3.052169
MED_INF	0	-1.465936	-3.029970
B: First Differences			
ΔHHI	1	-3.667223 I(1)*	-3.052169
ΔMED_INF	1	-3.050765 I(1)*	-3.040391

Notes: The t statistics are for ADF. The subscript (μ) in the model allows a drift term while τ allows for a drift and deterministic trend. Refer to the main text for the notations. Asterisks (*) indicate statistically significant at a 5 per cent level. Figures in parentheses are the lag lengths. The asymptotic and finite sample critical values for ADF are obtained from MacKinnon's (1996) ADF test examines the null hypothesis of a unit root against the stationary alternative. Δ denotes the first difference operator.

Source: Author's Computation from Eviews12

Based on Table 4.3, The Augmented Dickey-Fuller (ADF) test statistic for HHI at the level is -1.436155 with a critical value at the 5% level of -3.052169. Since the (ADF) test statistic is not greater than the critical value, therefore, the null hypothesis is not rejected. The test results do not provide enough evidence to conclude that the HHI has a unit root. This suggested that the HHI series is non-stationary and exhibits a stochastic trend, indicating a lack of long-term mean reversion. Meanwhile, for MED_INF, the Augmented Dickey-Fuller (ADF) test statistic for MED_INF at the level is -1.465936 with a critical value at the 5% level of -3.029970, and the test statistic is also not greater than the critical value. Thus, the null hypothesis was not rejected, as the results did not provide enough evidence to conclude that the MED_INF has a unit root. Similar to HHI, the MED_INF series is non-stationary and exhibits a stochastic trend, indicating a lack of long-term mean reversion.

Both HHI and MED_INF are non-stationary at level. Hence, differencing occurs using the same decision rule. The Augmented Dickey-Fuller (ADF) test statistic for the first difference of HHI is -3.667223 with a critical value of -3.052169. The test results provided sufficient evidence to reject the null hypothesis of a unit root in the first difference of HHI. This indicates that the first difference of the HHI series is stationary, and no stochastic trend is present. Thus, the first difference of the HHI series is likely to exhibit long-term mean reversion.

The Augmented Dickey-Fuller (ADF) test statistics for the first difference of MED_INF -3.050765 have a critical value of -3.040391. After taking the first difference, the series becomes stationary, suggesting that it possesses a stable long-term behaviour. The results provide sufficient evidence to reject the null hypothesis of a unit root in the first

difference of MED_INF. This indicates that the first difference of the MED_INF series is stationary, and no stochastic trend is present. The first difference of the MED_INF series is likely to exhibit long-term mean reversion. In this case, the conclusion is that HHI and MED_INF would be integrated into order one.

ii. Cointegration Test

Since the individual time series are integrated into order 1, the cointegration test was conducted to examine whether a stable long-term relationship existed between the two variables, HHI and Medical Inflation. The results are presented under two assumptions for the number of cointegrating equations, which are "None" (indicating no cointegration) and "At most 1" (allowing for at most one cointegrating equation). Both the Trace and Max Eigenvalue tests were considered in the cointegration test. If the p-value is below 0.05 significance level, the null hypothesis would be rejected and no cointegration was identified (Abbas and Sheikh, 2022).

Table 4.5: Cointegration Test

Null	Alternative	k=1 r=1			
		Max-Eigen Value		**Trace**	
		Unadjusted	**95% CV**	**Unadjusted**	**95% CV**
r = 0	**r = 1**	10.23631	14.26460	13.05422	15.49471
r ≤ 1	**r = 2**	2.817908	3.841565	2.817908	3.841565

Notes: Asterisks (*) denote statistically significant at a 5 per cent level. The k is the lag length, and r is the cointegrating vector(s). Chosen r: number of cointegrating vectors that are significant under both tests.

Based on Table 4.5 above, the unrestricted cointegration rank tests were conducted to determine if a lasting relationship exists between HHI and MED_INF. The null hypothesis tested whether there was no cointegration, while the alternative hypothesis suggested the

presence of at least one cointegrating vector. The obtained Trace statistics for the null and alternative hypotheses were 13.05422 and 2.817908, respectively. Comparing these values to the critical values of 15.49471 and 3.841465 at a significance level of 0.05, the tests failed to provide sufficient evidence to reject the null hypothesis, indicating no cointegration. Similarly, the Maximum Eigenvalue test yielded statistics of 10.23631 and 2.817908 for the null and alternative hypotheses, respectively. With p-values of 0.1128 and 0.0932 for the Trace test and 0.1969 and 0.0932 for the Maximum Eigenvalue test, both tests suggested no cointegration between HHI and MED_INF at the 0.05 significance level. Therefore, it cannot reject the null hypothesis of no cointegration even under this assumption. Consequently, any observed correlations or relationships between HHI and Medical Inflation are likely to be temporary and not indicative of a long-lasting equilibrium connection.

i. VAR Granger Causality

The VAR Granger Causality test is a fundamental statistical method used in time series analysis to explore causal relationships between variables (Toda and Phillips., 1993). The test determined whether HHI "Granger causes" MED_INF or MED_INF "Granger causes" HHI. To reject the null hypothesis, the p-value should be less than 0.05, indicating evidence of Granger causality. Otherwise, if the p-value is greater than or equal to 0.05, it means the null hypothesis cannot be rejected, and it indicates a lack of evidence for Granger causality.

Table 4.6: VAR Granger Causality Test

Dependent Variable: HHI			
Null: MED_INF does not cause HHI			
MED_INF	Degree of freedom	Chi-Square	Probability
	2	5.889701	0.0526
Dependent Variable: MED_INF			
Null: HHI does not cause MED_INF			
HHI	Degree of freedom	Chi-Square	Probability
	2	6.227141	0.0444***

Source: Author owns compilation
Note: *** statistically significant below the 5% level.

The result in Table 4.6 shows a one-way causality between HHI and MED_INF. Thus, the null hypothesis was rejected at the 0.05 significance level (p-value = 0.0444 < 0.05), suggesting that the past values of HHI Granger cause the current values of MED_INF. Meanwhile, for MED_INF to the HHI, the null hypothesis was not rejected at the 0.05 significance level (p-value = 0.0526 > 0.05), indicating no strong evidence to conclude that the past values of MED_INF Granger cause the current values of HHI.

This result indicates that fluctuations or changes in market concentration, as represented by the HHI, may have a causal impact on medical inflation dynamics. The findings highlighted that HHI Granger caused medical inflation, suggesting that market concentration fluctuations may play a causal role in shaping medical inflation trends. Thus, hypothesis 1 was accepted, indicating that the market structure of the private hospital industry significantly influenced medical inflation in Malaysia from 2002 to 2021. These results contribute to the understanding of the dynamic interactions between market concentration and medical inflation.

4.4.2 Relationship between Market Structure, Conduct, and Performance

Addressing research objective three of the study, Table 4.7 presents the results of static panel regression, where HHI, SHARE, CAP, ROS, and ROA were assessed as dependent variables. Additionally, three common panel estimators, namely Pooled Ordinary Least Squares (POLS), Fixed Effects (FE), and Random Effects (RE), were employed to comprehensively examine the dynamics of these relationships and their implications.

Table 4.7: Results of Static Panel Regression

	Intercept	**SHARE**	**CAP**	**ROS**	**ROA**
HHI					
POLS	-0.005712	0.459754 (0.006333)	0.0000415 (0.000119)	-0.001127 (0.000781)	-0.001325 (0.00633)
FE	-0.007743	0.536071 (0.006332)	0.0000915 (0.000099)	-0.000380 (0.000703)	-0.005323 (0.002221)
RE	-0.006623	0.519224 (0.006030)	0.0000927 (0.000092)	-0.000641 (0.000626)	-0.003822 (0.002069)
	POLS	**FE**	**RE**		
R2	0.892474	0.956062	0.915650		
Adjusted R2	0.891798	0.949333	0.915120		
F-statistic	1319.716 [0.0000]	142.0756 [0.0000]	1726.010 [0.0000]		
SHARE					
	Intercept	**HHI**	**CAP**	**ROS**	**ROA**
POLS	0.014268	1.940891 (0.026733)	-0.000110 (0.000245)	0.002863 (0.001604)	0.002718 (0.004856)
FE	0.015370	1.731370 (0.026733)	-0.000160 (0.000179)	0.001050 (0.001263)	0.011287 (0.003983)
RE	0.013207	(0.020450)	-0.000164 (0.000171)	0.001400 (0.001169)	0.009673 (0.003820)
	POLS	**FE**	**RE**		
R2	0.892814	0.966491	0.921619		
Adjusted R2	0.892140	0.961359	0.921126		
F-statistic	1324.399 [0.0000]	188.3274 [0.0000]	1869.545 [0.0000]		
CAP					
	Intercept	**HHI**	**SHARE**	**ROS**	**ROA**
POLS	1.990305 (0.204997)	4.605536 (13.20211)	-2.884977 (6.425073)	-1.866995 (0.249801)	-0.111246 (0.787211)
FE	2.138193 (0.225800)	16.59376 (18.06725)	-9.013069 (10.05365)	-0.086803 (0.299489)	-0.108452 (0.950729)

Table 4.7: continued

RE	2.226700 0.000381	11.96456 (14.19083)	-6.034220 (7.406077)	-1.528669 (0.239721)	-0.020463 (0.805550)
R2	0.100804	0.398699	0.066552		
Adjusted R2	0.095149	0.306608	0.060681		
F-statistic	17.82468 [0.0000]	4.329398 [0.0000]	11.33619 [0.0000]		
ROS					
	Intercept	**HHI**	**SHARE**	**CAP**	**ROA**
POLS	-0.052682 (0.033366)	-2.894831 (2.006190)	1.741633 (0.975570)	-0.043245 (0.005786)	1.230651 (0.109422)
FE	-0.129531 (0.034048)	-1.383924 (2.561811)	1.184628 (1.424975)	-0.001743 (0.006015)	1.205081 (0.124654)
RE	-0.142977 (0.046633)	-2.667813 (22.135384)	1.888379 (1.134518)	-0.030076 (0.005303)	1.296752 (-0.030076)
R2	0.256041	0.568608	0.205415		
Adjusted R2	0.251362	0.502539	0.200418		
F-statistic	54.72158 [0.0000]	8.606277 [0.0000]	41.10449 [0.0000]		
ROA					
	Intercept	**HHI**	**SHARE**	**CAP**	**ROs**
POLS	0.064591 (0.010764)	-0.372860 (0.664892)	0.181088 (0.323604)	-0.000282 (0.001997)	0.134799 (0.011986)
FE	0.044462 (0.010700)	-1.925052 (0.803114)	1.264004 (0.445974)	-0.000216 (0.001895)	0.119597 (0.012371)
RE	0.062276 (0.018784)	-1.268920 (0.720149)	0.848875 (0.389877)	0.0000265 (0.001761)	0.117385 (0.010943)
R2	0.185166	0.571901	0.169582		
Adjusted R2	0.180041	0.506337	0.164359		
F-statistic	36.13174 [0.0000]	8.722707 [0.0000]	32.46973 [0.0000]		

Based on the Breusch-Pagan test, the null hypothesis of all models was rejected at the significance level of 5% and the alternative hypothesis was accepted in all models. This result shows the existence of heteroscedasticity in the residuals and rejection of the homoscedasticity, and the random effect estimator is more appropriate. At the same time, the pooled ordinary least square estimator is less appropriate and more likely to provide biased estimation results in comparison to the random effect estimator. It means, a significant variation was observed in the distribution of residual variances between observations or groups for all models. The variation of the residual error in the model varies systematically between groups or dependent values.

The second test conducted was the Chow test, where the restricted F generated shows that all models are statistically significant and the null hypothesis was rejected at a 5% significance level. Thus, a significant difference was found in the regression parameters between groups or periods, making the Fixed effect estimator more appropriate for estimating the competitiveness models compared to the panel ordinary least square estimator.

The results of both the Breusch–Pagan LM test and the restricted F test consistently indicated that the pooled ordinary least squares estimator is less effective than fixed effects and random effects estimators in capturing the characteristics of the dataset used in this study. Consequently, the estimation outcomes obtained with the panel's ordinary least estimator for the models of firm competitiveness are likely to be biased and no longer reliable.

While both random effect and fixed effect estimators were deemed efficient, the Hausman test must be conducted to determine whether the fixed effect or random effect estimators were the most effective. When the p-value is less than 0.05, the random effect is selected the null hypothesis is rejected. Based on the result, the model with CAP, ROS and

ROA that act as dependent variables showed the p-value was less than 0.05. The null hypothesis for these models was rejected, indicating that there are no systematic differences between fixed effects and random effects models. However, the model with HHI and SHARE as dependent variables has insufficient evidence to reject the null hypothesis. There is a significant systematic difference between the fixed effects and random effects models.

Therefore, the use of the random effects estimator is considered more appropriate in HHI and SHARE as a dependent variable model, while the fixed effect estimator is considered more appropriate for CAP, ROS, and ROA as dependent variables.

The Random Effects (RE) model was chosen as the most appropriate to handle the heteroscedasticity assumption, with the use of White's HC Covariance estimation method. This produces varying ranges of robust standard errors for the HHI, SHARE, ROS, and ROA variables, indicating different levels of certainty in the parameter estimates. However, the CAP variable shows high robust standard errors, indicating a significant level of uncertainty in the parameter estimates.

The variables HHI and SHARE exhibited high R-squared (R2) values in all models, indicating that these models could explain a significant portion of the variation in the data. However, the variable CAP had a low R2 across all models, suggesting that these models may not fit the data well.

Additionally, the F-statistic for all models was statistically significant (p-value < 0.05), indicating that at least one independent variable had a significant effect on the dependent variable in these models. However, it is crucial to note that individual significance testing of independent variables is necessary to understand the specific contributions of each variable to the model.

It should be noted that the FE models exhibited higher R2 values compared to the RE models for the HHI and SHARE variables, suggesting that accounting for individual fixed effects improved the model's ability to explain variation in the data. However, for variables such as CAP, ROS, and ROA, the RE models had higher R2 values, indicating that random effects may be significant factors in these models.

The HHI model demonstrated a strong fit with high F-statistic values across all estimations: 1319.716 for POLS, 142.076 for FE, and 1726.010 for RE. Correspondingly, the adjusted R-squared values were notably high, indicating substantial explanatory power: POLS (0.891798), FE (0.949333), and RE (0.915120), suggesting that these models effectively captured most of the variability in HHI data.

Similarly, the SHARE model exhibits a favourable fit with high F-statistic values for all estimations: 1324.399 for POLS, 188.327 for FE, and 1869.545 for RE. The adjusted R-squared values are also notably high, POLS (0.892140), FE (0.961359), and RE (0.921126), indicating the models' ability to explain variations in SHARE data effectively.

Conversely, the CAP model shows a poor fit with low F-statistic values across all estimations: 17.825 for POLS, 4.329 for FE, and 11.336 for RE. Correspondingly, the adjusted R-squared values are notably low: POLS (0.095149), FE (0.306608), and RE (0.060681), suggesting inadequate suitability of these models to the data.

The ROS and ROA models demonstrate a relatively good fit, with moderate F-statistic values for all estimations and relatively high adjusted R-squared values. However, the lower R-squared values compared to adjusted R-squared values imply the potential insignificance of some independent variables in the models.

The finding shows a significant relationship between market structure and the behaviour and performance of private hospitals in Malaysia. However, the less-than-satisfactory results associated with the CAP model highlighted that the variables representing behaviour may not adequately explain variation in the data, suggesting that other aspects need to be considered in explaining the behaviour of private hospitals. In the context of the ROS and ROA models, the results are quite good, showing a significant relationship between the behaviour and performance of private hospitals. However, it should be noted that several independent variables may not be significant in influencing hospital performance.

The regression results indicate that the HHI (Herfindahl-Hirschman Index) variable is statistically significant across all models, with p-values < 0.05, suggesting a strong positive correlation with the dependent variable. This result signifies that market concentration significantly influences the dependent variable, implying the dominance of a few large private hospitals in the market. Similarly, the SHARE variable also demonstrates statistical significance across all models, with p-values < 0.05, indicating a significant positive impact on the dependent variable. Thus, private hospitals with larger market shares tend to perform better, highlighting the importance of market share in determining hospital performance.

On the other hand, the effect of conduct changes (CAP) shows mixed results. In the POLS model, the CAP variable is not statistically significant, while in the FE and RE models, it is significant with p-values < 0.05, albeit with weaker coefficients. This result suggested that conduct changes may have a less consistent or smaller impact on hospital performance. The ROS (Return on Sales) and ROA (Return on Assets) variables exhibit statistical significance across all models, with p-values < 0.05, indicating a positive correlation with the dependent variable. This result implies that operational efficiency and investment returns

significantly influence hospital performance.

In conclusion, variables such as the Hirschman Index (HHI) and Market Share (SHARE) showed a significant relationship with hospital performance, with high and consistent values in all models. This result confirmed that the strong influence of market dominance and large market share on the success of hospitals. However, unsatisfactory results related to models describing changes in behaviour (CAP) indicate that this variable is not always consistent in influencing hospital performance. In some models, the effect is insignificant, while in others, it plays a smaller or less consistent role.

This analysis highlights the complexity of factors influencing hospital behaviour and performance other than market structure and market share. Return on Sales (ROS) and Return on Assets (ROA) also proved to be significant in all models, having an important influence on hospital performance. This confirms that surgical efficiency and reinvestment returns play a crucial role in determining hospital success.

Overall, this analysis showed that although there was a strong relationship between market structure and hospital performance, other factors, such as behavioural changes and operational efficiency, also played a critical role. Therefore, more holistic strategies and initiatives may be needed to improve the performance of private hospitals in Malaysia.

vii. Granger Causality Test

Table 4.8: Pairwise Granger Causality Test Results Table

Direction of Causality			Probability	Decision on Hypothesis Testing	Conclusion	Type of Causality
SHARE	◄	HHI	0.0000	Reject H_0	SHARE Granger caused HHI	Two-way Causality
HHI	◄	SHARE	0.0000	Reject H_0	HHI Granger caused SHARE	
CAP	◄	HHI	0.9829	Does not reject H_0	CAP does not Granger cause HHI	No Causality
HHI	◄	CAP	0.7908	Does not reject H_0	HHI does not Granger caused CAP	
ROS	◄	HHI	0.7310	Does not reject H_0	ROS does not Granger caused HHI	No Causality
HHI	◄	ROS	0.6108	Does not reject H_0	HHI does not Granger caused ROS	
ROA	◄	HHI	0.8998	Does not reject H_0	ROA does not Granger caused HHI	No Causality
HHI	◄	ROA	0.7871	Does not reject H_0	HHI does not Granger caused ROA	
CAP	◄	SHARE	0.7171	Does not reject H_0	CAP does not Granger caused SHARE	No Causality
SHARE	◄	CAP	0.8266	Does not reject H_0	SHARE does not Granger caused CAP	
ROS	◄	SHARE	0.8231	Does not reject H_0	ROS does not Granger caused SHARE	No Causality
SHARE	◄	ROS	0.3408	Does not reject H_0	SHARE does not Granger caused ROS	
ROA	◄	SHARE	0.9150	Does not reject H_0	ROA does not Granger caused SHARE	No Causality
SHARE	◄	ROA	0.6951	Does not reject H_0	SHARE does not Granger caused ROA	
ROS	◄	CAP	0.0001	Reject H_0	ROS Granger caused CAP	Two-way Causality
CAP	◄	ROS	0.0000	Reject H_0	CAP Granger caused ROS	

Table 4.8: continued

ROA ◄	CAP	0.8356	Does not reject H_0	ROA does not Granger caused CAP	No Causality
CAP ◄	ROA	0.0710	Does not reject H_0	CAP does not Granger caused ROA	
ROA ◄	ROS	0.0001	Reject H_0	ROA Granger caused ROS	One-way Causality
ROS ◄	ROA	0.4108	Reject H_0	ROS Granger caused ROA	One-way Causality

Based on the pairwise Granger causality tests, there was evidence to suggest a causal relationship between some of the variables in the dataset. The null hypothesis of the Granger causality test is that the past values of one variable do not cause the other variable. If the probability value is less than the chosen significance level (0.05), then the null hypothesis is rejected, signifying evidence of a Granger causal relationship.

Five out of the ten pairs tested exhibit Granger causality. These pairs are (SHARE to HHI), (HHI to SHARE), (CAP to ROS), (ROA to ROS), and (ROS to ROA), as indicated in Granger Causality Directionality Diagram below:

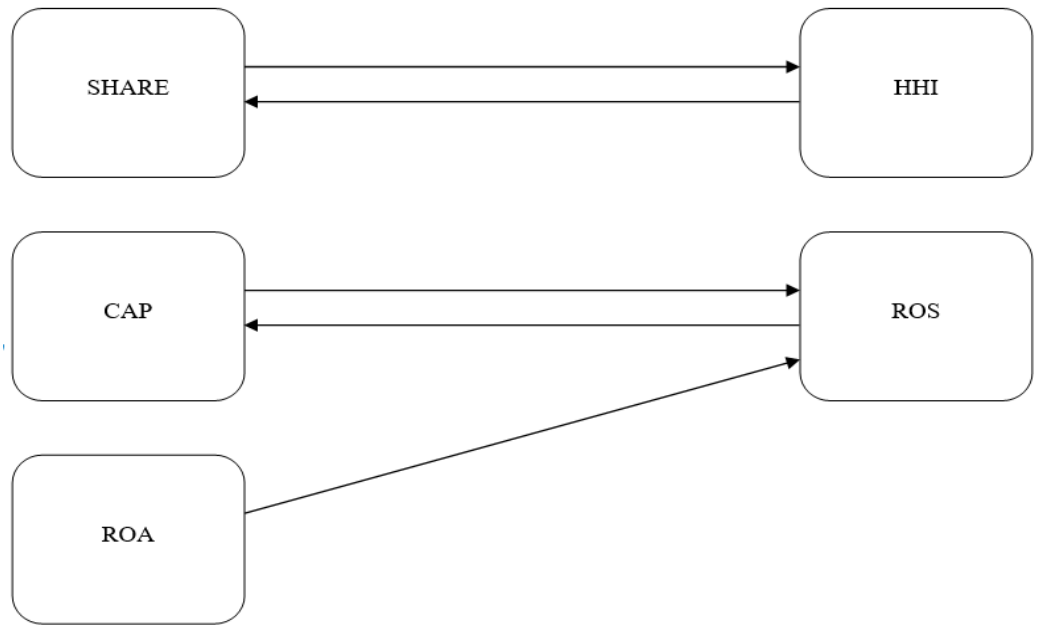


Figure 4.2: Granger Causality Directionality Diagram

As a result, hypothesis 3, which states that there is a causal relationship between market structure, conduct, and performance in the private hospital industry in Malaysia, was accepted as these findings indicate significant directional relationships between the variables, with some variables having predictive power over others. Even though some pairs showed

no evidence of Granger causality, it does not necessarily imply the absence of a causal relationship between these variables. Rather, it suggested that past values of one variable may not cause changes in the other variable.

The identified reciprocal relationship between market share and market concentration emphasised the pivotal role of larger hospitals in shaping market dynamics. This finding suggested that changes in market share can significantly influence market concentration, which, in turn, can impact the competitive landscape for both existing and new players in the industry. However, while this relationship offers opportunities for market influence, it also poses challenges in terms of market entry for smaller hospitals and potential monopolistic tendencies among dominant players, which could hinder competition and innovation.

Moreover, the observed link between operational efficiency and financial performance underscores the importance of effective management practices within private hospitals. Efficiently operated hospitals tend to achieve better financial outcomes, emphasising the significance of optimizing resource allocation, streamlining processes, and enhancing service delivery. The complex relationship between operational efficiency and capital dependence highlights certain challenges. Sometimes, when operations run smoothly, less capital investment is required. However, to remain competitive, strategic investments in technology, infrastructure, and employee development may be necessary. Consequently, striking a balance between operational efficiency and capital utilisation becomes imperative for sustainable growth and performance improvement.

The direct impact of return on assets (ROA) on return on sales (ROS) shows the critical role of asset management and utilisation in driving revenue generation. Yet, the limited direct influence of ROS on HHI suggested that while revenue generation is essential

for hospital sustainability, it may not significantly alter market concentration dynamics. This result highlights the importance of taking a comprehensive approach to performance management, encompassing both operational efficiency and financial stewardship, to navigate the complexities of the private hospital industry.

Hence, they could focus on improving operational efficiency through process optimisation, staff training, and technology adoption to enhance their competitive edge. Moreover, fostering collaborations or partnerships with other healthcare providers could also help in expanding their market presence and mitigating the effects of market concentration.

4.5 Results Overview

Table 4.9: Results Overview

Hypothesis	Result
RO_1	The HHI for the Malaysian private hospital industry showed that the market structure was characterised by monopoly and lower competition conditions during the period from 2002 to 2011, transitioning to a monopolistic and highly competitive environment from 2012 to 2021.
H_2	**VAR Granger Causality**
	Only the market structure of the private hospital industry has a causal relationship with medical inflation in Malaysia from 2002 to 2021.
H_3	**Panel Regression**
	There is a relationship between market concentration (HHI) and the independent variables (CAP, ROS, ROA) in the private hospital industry in Malaysia.
	There is a relationship between market share (SHARE) and the independent variables (CAP, ROS, ROA) in the private hospital industry in Malaysia.
	There is a relationship between capital expenditure (CAP) and the independent variables (HHI, SHARE, ROS, ROA) in the private hospital industry in Malaysia.
	There is a relationship between return on assets (ROA) and the independent variables (HHI, SHARE, CAP) in the private hospital industry in Malaysia.
	Panel Causality
	There is a bidirectional causal relationship between market share and market concentration in the Malaysian private hospital industry.

Table 4.5: continued

	There is no causal relationship between market share and capital intensity in the Malaysian private hospital industry.
	There is no causal relationship between market share and return on Sales in the Malaysian private hospital industry.
	There is no causal relationship between return on asset and market concentration in the Malaysian private hospital industry.
	There is no causal relationship between market share and return on Sales in the Malaysian private hospital industry.
	There is no causal relationship between market concentration and capital intensity in the Malaysian private hospital industry.
	There is no causal relationship between market concentration and return on sales in the Malaysian private hospital industry.
	There is no causal relationship between market concentration and return on asset in the Malaysian private hospital industry.
	There is a bidirectional causal relationship between capital intensity and return on sales in the Malaysian private hospital industry.
	Only the return on assets of the private hospital industry has a causal relationship with the return on sales in Malaysia from 2002 to 2021.

4.6 Chapter Summary

This chapter examined market concentration within Malaysia's private hospital industry, with a specific emphasis on utilizing the Herfindahl-Hirschman Index (HHI). Moreover, it utilised a descriptive analysis to assess important market structure and competitiveness indicators. The chapter utilised a range of statistical methodologies, including unit root tests, cointegration analysis, and Vector Autoregression (VAR) models, to conduct dynamic analysis on time series variables.

The main purpose of this chapter is to conclude the market structure and competitiveness of the private hospital industry in Malaysia by understanding a thorough comprehension of the interplay between market structure, conduct, and performance in the

industry. The chapter utilised secondary data sources, such as financial data from private hospitals, to investigate the complex link between the three aspects represented by the SCP paradigm. In this process, statistical analysis evaluates various indicators, including market concentration and the relationship among variables.

The chapter explored the importance of comprehending the market structure and competition within the private hospital industry in Malaysia to gain insights into the variables that contribute to the increase in medical inflation. Through the analysis of market concentration and several other indicators, stakeholders such as policymakers, private hospitals, and patients may get valuable information about the performance and competitiveness of the healthcare industry. These insights can then be utilised to formulate effective strategies.

Moreover, the chapter utilised the Granger causality test to examine the causal association between market structure, conduct, and performance within the private hospital industry in Malaysia. This study facilitated a more profound comprehension of these variables' interplay and reciprocal influence, eventually affecting the industry's overall performance.

Overall, this chapter thoroughly examined the market structure and competitive dynamics within the private hospital industry in Malaysia. This study enhanced comprehension of the interplay between market structure, conduct, and performance in the specified industry, elucidating the determinants of medical expenses and their ramifications for medical inflation.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter 5 leads to a detailed analysis of the research findings. In this chapter, the research findings are described and discussed in the context of the research questions and research objectives. Besides, a summary of findings is provided to explain the discoveries of this research. In addition, the limitations inherent to the research endeavour are acknowledged, followed by the formulation of recommendations for future investigations rooted in the SCP Paradigm within the private hospital industry in Malaysia, alongside its market dynamics. Thus, this chapter provides a comprehensive overview of the results of the analysis that has been done and its implications for the private hospital industry in Malaysia.

5.2 Summary of Findings

Notably, the study revealed that the private hospital sector in Malaysia exhibited significant levels of market concentration, dominance, and monopoly power during the examined period, as evidenced by calculated Herfindahl-Hirschman Index (HHI) values ranging from 808.96 to 5432.29. Through the analysis of time series causality, it was apparent that HHI exerts an influence on medical inflation, leading to the proliferation of product variety and enhanced consumer choice. Despite the prevailing market power held by large entities, the potential for heightened competition emerges as additional players contend for market share.

Furthermore, the relationship between the degree of market concentration (HHI), market share (SHARE), capital expenditure (CAP), rate of return on sales (ROS), and rate of return on assets (ROA) in the private hospital industry in Malaysia was observed. These

findings indicated a mutual influence between these variables. High market concentration is associated with greater capital expenditure, better sales results, and more positive financial results. The larger market share also has a similar relationship to capital expenditure also affects how concentrated the market is, market share, as well as sales and financial results. Likewise, better sales results were found to be related to the level of market concentration, market share, and capital expenditure. Also, positive financial results were also related to the level of market concentration, market share and capital expenditure. These findings reflected the complexity of the relationship between these variables in the Malaysian private hospital industry.

On the other hand, the panel Granger causality test results revealed a two-way causality between HHI and SHARE. The two-way causality between HHI and SHARE suggested a dynamic relationship between market concentration and firm performance in the private hospital industry, indicating that market concentration can affect the market share of private hospitals, which may result in changes in pricing behaviour.

However, the result from the Granger Causality test conducted on all of the variables of the SCP paradigm used in this study did not find any causal relationships between (1) CAP and HHI, (2) ROS and HHI, (3) ROS and HHI, (4) CAP and SHARE, (5) SHARE and CAP, (6) ROS and SHARE, (7) SHARE and ROS, (7) ROA and SHARE, (8) SHARE and ROA, (9) ROA and CAP, and (10) CAP and ROA.

Moreover, the two-way causality between CAP and ROS and the one-way causality between ROA and ROS provided additional insights into the relationship between hospital conduct and performance. The findings suggested that increases in capital expenditure can lead to better performance outcomes for private hospitals in Malaysia. These findings are

highly relevant to the research objectives of examining the relationship between the current market structure, conduct, and performance of private hospitals in Malaysia.

Table 5.1: Overview of the Research's Structure

Research Problem	The private hospital industry in Malaysia has been impacted by concerns surrounding the high costs of medical services for the last 20 years, from 2002-2021. This problem arises from the intricate connections between the structure of the market, the conduct of hospitals, and healthcare costs.		
General Research Objective	The main objective of this study is to comprehensively analyse the market structure of the private hospital industry in Malaysia and investigate its implications on medical inflation. This study also aims to investigate the causal relationships that exist within and between the market structure, conduct, and performance of the private hospital industry in Malaysia.		
Specific Research Objective	**Specific Research Questions**	**Findings**	
RO1: To determine the market structure of the private hospital industry in Malaysia by analysing indicator such as Market Concentration through HHI.	RQ1: What is the current market structure and the level of competition in the Malaysian private hospital industry?	RO1 accepted. Between 2002 and 2021, the HHI for the Malaysian private hospital industry shows that the market structure was characterised by monopoly and lower competition conditions during the period from 2002 to 2011, transitioning to a monopolistic and highly competitive environment from 2012 to 2021.	
RO_2: To investigate the impact of market structure on medical inflation in Malaysia during the period from 2002 to 2021	RQ_2: How has the market structure in Malaysia influenced the trend of medical inflation from 2002 to 2021?	H_2: The market structure positively influenced the trend of medical inflation in Malaysia.	H_2 accepted. Fluctuations in market concentration (HHI) play a causal role in shaping medical inflation.
RO_3: To investigate the impact between market structure, conduct, and performance in the private hospital industry in Malaysia.	RQ_3: How do the Structure, Conduct, and Performance relate to each other in the context of	H_3: There is causality within the market structure, conduct and performance of the private hospital in	H_3 has gained only partial acceptance. There is a reciprocal relationship between the market

Table 5.1: continued

	the private hospital industry in Malaysia?	Malaysia.	share and market concentration which means changes in market share can have an impact on the dynamics of market concentration, and vice versa. Also, both the intensity of capital and the rate of return on sales have a mutually reinforcing influence. However, only the rate of return on assets in the private hospital industry has a direct impact on the rate of return on sales

5.3 Discussion

The discussion section serves as the cornerstone of this dissertation, as it provides a comprehensive analysis and interpretation of the results obtained in this study. Competition, marked by firms vying for customers and profits, contrasts with competitiveness, which encompasses broader factors like innovation and efficiency. Through critical analysis and literature connections, the study explored how private hospitals (Wanyonyi & Rugami, 2022) cope with competition (Cooper, 2018) and drive performance (Wanyonyi, 2022).

This section presents an in-depth exploration of the research findings and aims to shed light on their significance in the context of the objectives. By critically examining the results and drawing connections to the existing literature, this discussion seeks to provide valuable insights to address the research problem of the current study, which is medical inflation in Malaysia.

5.3.1 The Effect of Market Structure Towards the Competitiveness of Private Hospitals in Malaysia

The Industrial Organisation Theory focuses on assessing the competitiveness of the market, which is useful for policymakers. This was proven effective as the framework of the Structure, Conduct, and Performance Paradigm. The framework was then developed by Joseph Bain in 1959 and was used by the US government to develop antitrust laws. The Industrial Organisation Theory also suggests that the SCP framework is widely embraced for assessing competitive sectors because of its focus on how the structure of an industry affects firm conduct and performance.

Regulatory theory plays a crucial role in shaping public policy and antitrust measures within the private hospital industry in Malaysia (Croke et al., 2019). By examining the regulatory landscape and enforcement mechanisms, policymakers can promote competition, consumer welfare, and efficiency in healthcare markets. The application of antitrust principles aims to prevent anti-competitive practices, ensure market transparency, and safeguard the interests of patients and healthcare providers (Thomas et al., 2011). Understanding the interplay between regulatory theory, public policy, and antitrust enforcement is essential for fostering a competitive environment that benefits both stakeholders and the broader healthcare system.

Game theory provides a strategic framework for analysing the behaviour of players in competitive markets, including private hospitals in Malaysia (Tang et al., 2015). By modelling interactions between healthcare providers, insurers, and patients, game theory offers insights into decision-making processes, pricing strategies, and market outcomes. Understanding the strategic interactions and incentives within the private hospital industry can help stakeholders anticipate competitive responses, optimise resource allocation, and enhance overall market efficiency. Incorporating game theory principles into market analysis can shed light on the complexities of competition and cooperation among industry participants (Mendonca et al., 2020).

Market structure theory offers a lens through which to assess the competitiveness of private hospitals in Malaysia within contestable markets. By examining entry barriers, firm behaviour, and regulatory influences, market structure theory elucidates the dynamics of competition, market power, and performance in healthcare markets (Croke et al., 2019). Analysing the effect of market structure on the competitiveness of private hospitals can

reveal insights into pricing strategies, service quality, and patient outcomes. Understanding how market structure influences the conduct and performance of healthcare providers is essential for designing effective policies that promote competition, innovation, and affordability in the private hospital industry.

By integrating insights from industrial organisation theory, regulatory theory, game theory, and market structure theory into the analysis of the private hospital industry in Malaysia, stakeholders can gain a comprehensive understanding of the factors shaping market competitiveness, strategic decision-making, and regulatory outcomes. This holistic approach can inform policy recommendations, industry practices, and future research directions aimed at enhancing the overall competitiveness and performance of private hospitals in Malaysia.

From 2002 to 2011, the Herfindahl-Hirschman Index (HHI) analysis indicated that the Malaysian private hospital industry exhibited a market structure characterised by high concentration, marked by significant market dominance and monopoly power. However, between 2012 to 2021, the industry transitioned towards a state of monopolistic competition. The HHI values ranged from a relatively high value of 5432.29 in 2002 to a lower value of 3416.89 in 2011. However, starting from 2012, when the Competition Act 2010 came into force, the HHI result showed a significant drop from 3416.89 in 2011 to 1032 in 2012, showing a drastic transition from monopoly to monopolistic competition.

From the HHI results, it can be inferred that the implementation of the Competition Act 2010 may have led to increased competition among private hospitals. The act prohibits anti-competitive practices such as price-fixing, market sharing, and bid-rigging, as these practices could create a more competitive environment for private healthcare providers.

Also, the act includes provisions on merger control, which means that mergers and acquisitions among private hospitals are subjected to scrutiny to ensure they do not substantially lessen competition in the market. This could have implications for market concentration and the structure of the private hospital industry. In terms of customer welfare, the Competition Act 2010 is also intended to protect consumer interests. By promoting competition, consumers may benefit from more competitive prices and improved services in the private hospital sector.

Within the private healthcare sector, anti-competitive practices manifest in various forms, all of which are aimed at stifling competition and disenfranchising consumers. Price-fixing, for instance, involves collusion among private hospitals to set uniform prices for services that curtail price competition, resulting in inflated costs for patients. Similarly, market allocation agreements, where hospitals divide markets or customers among themselves, constrict consumer choice and hinder market competition. Bid-rigging, another prevalent form of collusion, involves hospitals manipulating procurement processes to predetermine contract winners can lead to inflated prices and inefficiencies in the procurement of medical equipment. Moreover, exclusive dealing practices, such as agreements between hospitals and suppliers that limit consumers to exclusive deals and tying and bundling practices, where patients are required to use specific services or products as a condition of treatment, further restrict competition in healthcare services and curtail patient choice. In enforcing regulations like the Competition Act 2010, regulatory bodies such as the Malaysia Competition Commission (MyCC) endeavour to combat these anti-competitive practices, foster fair competition, safeguard consumer interests, and ensure the presence of a competitive and transparent private healthcare market. Through these concerted efforts, the aim is to promote an environment where competition can thrive, as it drives innovation

and efficiency and, ultimately, delivers better healthcare outcomes for consumers.

The result is consistent with previous literature, which analyses the concentration of the private hospital market and the implication of the competition act on the private healthcare sector in South Africa. The study discusses the implications of the Competition Act on the private healthcare sector in South Africa. The act, specifically a ruling by the Competition Tribunal in 2004, prohibited collective bargaining between various players in the sector, including the Hospital Association of South Africa (HASA), the Board of Healthcare Funders (BHF), and the South African Medical Association (SAMA). Prior to the ruling, private hospital groups that were collectively bargaining as HASA members were grouped when calculating market concentration. However, after the prohibition of collective bargaining, each hospital group was considered a separate negotiating entity. This action led to a significant decrease in concentration in the private hospital market from 2003 to 2004, with concentration levels remaining constant after 2004.

Moreover, the identification of causal links between market concentration, market share, return on sales, and capital provides additional evidence to support the significance of market structure in influencing market behaviour and performance. These linkages show the importance of establishing an environment that promotes competition, as it has the potential to enhance the performance of private hospitals and eventually provide customers with better quality treatment and lower costs.

Thus, HHI was shown in helping to regulate the Competition Act by providing a quantitative measure of market concentration, which is crucial for identifying anticompetitive behaviour and determining the appropriate regulatory actions. It allows regulators to assess the level of competition within an industry, detect potential abuses of

market power, and make informed decisions to promote fair competition and protect consumer welfare. The establishment of a fair and equitable environment, together with a reduction of barriers to market entry, may facilitate the entrance of additional private hospitals into the industry. This influx of competitors has the potential to enhance market competitiveness and, therefore, exert downward pressure on the cost of healthcare.

5.3.2 The Effect of Market Structure and Medical Inflation

According to the Industrial Organisation theory, market power and pricing power are highly dependent on the market structure of the industry. Market structure plays a crucial role in determining pricing power. In perfectly competitive markets, firms have limited pricing power since they are price takers, meaning they must accept the market price as given. However, in oligopolistic or monopolistic markets, firms often have more pricing power as they can influence prices due to their market share and influence demand. On this basis, H_2 is formulated to address the rising medical inflation in Malaysia.

The findings from the unit root tests indicate that both the HHI and medical inflation series in Malaysia demonstrate non-stationarity at the level, suggesting a lack of long-term mean reversion. However, after taking the first difference, both series become stationary, implying stable long-term behaviours with mean reversion. Also, the results of the VAR Granger Causality test indicated a significant Granger causality from the HHI to medical inflation, suggesting that fluctuations in market structure (HHI) may causally influence medical inflation.

Hence, the analysis of the market structure (HHI) and its influence on medical inflation in Malaysia from 2002 to 2021 provides evidence of a significant relationship, suggesting that fluctuations in market concentration, as measured by the HHI, may play a

causal role in shaping medical inflation trends. Also, changes in market concentration may have a causal impact on medical inflation, indicating the importance of monitoring and managing market structures in the healthcare sector to mitigate inflationary pressures.

Although other contributing factors can contribute to high medical costs, it is equally essential that the relationship between medical inflation and market concentration is studied, as previous studies have proven that market concentration has an impact towards rising medical costs. One possible explanation for the results obtained from the VAR Granger Causality test is that there is a significant relationship between medical inflation and the market concentration of private hospitals eventually. Going back to the Industrial Organisation Theory, which indicates that market structure affects the market conduct of firms, is what makes this hypothesis relevant. This hypothesis was tested on the basis that the market structure of private hospitals influences the pricing behaviour of private hospitals, which may be one of the contributing factors to rising medical inflation in Malaysia.

Moreover, previous studies by Erasmus (2016) and Pany et al. (2021) found that the pricing behaviour of hospitals is the result of market power held by hospitals that own a larger market share within the industry. This means that when the hospital industry is highly concentrated, meaning there are fewer competitors, they may have more market power. This market power can lead to higher prices for medical services, contributing to medical inflation. With limited competition, private hospitals may be able to set higher prices for their services without fear of losing a significant number of patients to competitors. On the other hand, highly concentrated hospitals might benefit from economies of scale, which means they can produce medical services at lower costs due to their size and volume. However, rather than passing these savings on to patients, they may use their market

dominance to charge higher prices and increase profitability.

On the other hand, the findings from previous literature on the Dutch healthcare system did not generally note that higher prices are not associated with market power. Overall, H1 is supported where the market structure of the private hospital industry impacted the medical inflation in Malaysia. This is consistent with the findings from previous literature on the Dutch healthcare system, where there is evidence suggesting a positive relationship between hospital market concentration (indicated by higher HHI values) and prices. In the United States, other studies have found that higher hospital concentration leads to higher prices (Dranove, 2011; Noether et al., 1988). Similarly, studies conducted in the Netherlands have also indicated positive price effects because of hospital mergers, with hospitals having higher concentration levels associated with higher prices (Berden, 2019).

Thus, it is critical to call for regulating the policy needed to contain the pace of increasing healthcare costs. The Malaysian government is currently going toward decreasing the government allocation on healthcare, which may drive up the Out-of-Pocket expenditure for Malaysians as there will be reduced subsidies for healthcare services and medications. Thus, Malaysians may have to bear a larger portion of the cost of healthcare services out of their pockets in line with the increasing demand for healthcare in Malaysia due to the ageing population, increased health awareness, and an increase in the number of non-communicable diseases.

5.3.3 Relationship within and between the Market Structure, Conduct, and Performance

The Industrial Organisation theory by Bain (1951) suggested a direct relationship between the Structure, Conduct, and Performance of an industry where Market Structure will

impact how the firms will react and the firm's strategy will impact the performance of firms in the industry. However, as the Industrial Organisation Theory progressed, the modified SCP paradigm delved into examining the relationship within and between the SCP paradigm and considering the public policies on taxation, subsidies, international commerce, investment, and other economic concepts, which were found to have multidirectional relationships within all the elements. Thus, H2 was tested based on this theory, where all the variables were tested within and between each other to prove a multidirectional relationship of the SCP paradigm in the private hospital industry.

The findings reveal a bidirectional causality between HHI and SHARE, with a notable probability value of 0.0000, indicating that changes in market concentration (HHI) can influence future market share (SHARE) in the private hospital industry in Malaysia. Similarly, the probability value for SHARE impacting HHI is also below 0.05 (0.000), emphasising the dynamic connection between changes in market share and future market concentration. It suggests that an increase in market share can lead to higher market concentration. One possible explanation for this is that market concentration is dependent on market share. If the private hospital's increasing market share tends to be followed by a rise in market concentration, it might indicate a trend of consolidation and growing market power. Conversely, a decrease in market share might decrease market concentration, possibly reflecting a more competitive environment with new entrants gaining ground.

Regarding the relationship between market share and market concentration, market concentration is a broader measure that considers both the number and size distribution of firms in the market, while market share focuses solely on the individual firm's relative size within the market. A higher market share for a firm indicates that it has a larger portion of

the market, but it does not provide information about the overall concentration in the market.

Market structure and business conduct play a significant role in shaping medical costs in the private healthcare sector, impacting both providers and patients. In the case of Sime Darby, as it navigates the healthcare industry, understanding these factors is crucial (Sime Darby Annual Report, 2023). The market structure, including the level of competition and regulatory environment, can influence pricing strategies and cost dynamics. In markets where Sime Darby operates healthcare facilities, limited competition due to market consolidation may lead to higher medical costs for patients. Additionally, business conduct, such as pricing transparency and service delivery models, can impact overall expenses.

Current pricing and business practices in the private healthcare sector, including fee-for-service models and lack of price transparency, contribute to the growing medical costs. For Sime Darby, ensuring ethical billing practices and promoting cost-effective healthcare services post-divestment from the healthcare sector is essential. Recent examples of pricing strategies and billing practices in the private healthcare industry, such as overutilisation of services in fee-for-service models and opaque billing practices, highlight the need for industry-wide reforms to control escalating medical costs.

Market dynamics like competition, consolidation, and regulatory factors also influence pricing decisions, ultimately affecting healthcare expenses for patients. By aligning with best practices, promoting competition, and advocating for regulatory reforms in the healthcare sector, Sime Darby can contribute to a more sustainable and affordable healthcare landscape while focusing on its core automotive and industrial businesses.

The market structure and business conduct in the private healthcare sector can significantly impact medical costs, and Subang Jaya Medical Centre (SJMC) is no exception.

In a competitive market, healthcare providers may engage in price competition to attract patients, potentially driving down costs. However, this situation can lead to a focus on volume rather than quality, impacting patient care. Conversely, in a less competitive market with limited choices for patients, healthcare providers may have more pricing power, potentially leading to higher medical costs.

Additionally, business conduct such as overutilisation of services, unnecessary procedures, or aggressive marketing tactics can contribute to escalating medical expenses for patients. Recent pricing and business practices in the private healthcare sector, including those observed at SJMC, have contributed to growing medical costs. These practices include the practice of fee-for-service, where healthcare providers are reimbursed based on the volume of services provided rather than patient outcomes, potentially incentivizing unnecessary procedures. Moreover, the lack of transparent pricing and billing practices can lead to surprise medical bills for patients, adding to their financial burden. Additionally, the use of advanced and costly medical technologies and pharmaceuticals without sufficient cost controls can also contribute to rising healthcare expenses.

Market dynamics such as competition, consolidation, and regulatory factors play a crucial role in influencing pricing decisions and affecting healthcare expenses for patients at SJMC. For instance, in a highly consolidated market where a few large healthcare entities dominate, there may be less competitive pressure to keep prices in check. Regulatory factors, including government policies on healthcare reimbursement and insurance coverage, can also impact pricing decisions and subsequently affect the out-of-pocket costs for patients seeking medical services at SJMC. Furthermore, changes in healthcare regulations and policies can influence the overall cost structure and pricing strategies adopted by private

healthcare providers, thereby impacting the affordability of healthcare services for patients (Subang Jaya Medical Centre Annual Report, 2023).

In the case of the private healthcare sector in South Africa, the study analysed changes in the market structure of medical schemes, administrators, and hospitals. The findings indicated an increase in market concentration in the medical scheme and administrator markets from 2004 to 2012, while the concentration in the private hospitals market remained relatively stable. This finding suggested that a few large schemes and administrators gained a larger market share during this period, leading to increased market concentration in those sectors.

However, there was no evidence supporting the impact of market concentration (HHI) on capital intensity (CAP), return on sales (ROS), and return on assets (ROA) within the private hospital industry in Malaysia. Similarly, when market share is taken as the dependent variable, there is no evidence supporting its influence on capital intensity (CAP), return on sales (ROS), and return on assets (ROA) either.

Apart from that, the test results indicate a bidirectional Granger causality between capital intensity (CAP) and return on sales (ROS). Specifically, the significant probability value of 0.0001 for ROS Granger causing CAP indicates that fluctuations in Return on Sales can offer valuable predictive information about the future Capital Intensity of private hospitals in Malaysia. On the other hand, the probability value of 0.0003 for CAP Granger causing ROS suggests that changes in capital intensity can predict future changes in return on sales. However, there is no evidence supporting the impact of capital intensity on the return on assets (ROA) of the private hospital industry in Malaysia. These findings suggested that private hospitals with higher ROS might have more resources and funds available for

capital investment. They can use their profitability to finance projects that improve their facilities, purchase new medical equipment, or expand their services. This increased capital intensity, in turn, can lead to improved efficiency and higher profitability in the future. Also, higher capital intensity in private hospitals can provide better healthcare services, leading to higher patient satisfaction and a better reputation. A positive reputation can attract more patients and improve financial performance, which is reflected in higher ROS. A study in the pharmaceutical industry in Malaysia found that a firm's ROS and CAP, which have a bidirectional relationship, indicate that a higher return on sales leads to lower capital investment.

The findings also reveal a one-way causality between return on assets (ROA) and return on sales (ROS). The significant probability value below 0.05 for ROA granger causing ROS suggested that changes in return on assets can predict future changes in return on sales. Conversely, the lack of evidence supporting ROS-causing ROA indicates that changes in return on sales may not be effective predictors for future alterations in return on assets. This might indicate that past values of ROA can help predict future changes in ROS. This finding suggested that the financial performance of private hospitals, as measured by their ROA, has a predictive influence on their return on sales. A higher ROA implies that the private hospital is effectively using its assets to generate profits. Efficient asset utilisation can lead to cost savings and improved financial performance, which can positively impact ROS by increasing net income relative to total sales. According to previous literature by Chong and Chan (2014), the study found a dual relationship between ROS and ROA, suggesting that when the ROA granger cause ROS, an improvement in ROA might lead to an increase in ROS, indicating that better financial performance in terms of return on assets can contribute to higher returns on sales.

Overall, these findings are supported by previous literature such as Chong and Chan (2014) and Erasmus and Theron (2016), who examined the causal relationship between Structure-Conduct-Performance within the healthcare industry. Although there were limited findings on the Granger Causalities of the variables, most of these findings are consistent with the Industrial Organisation Theory, where Structure, Conduct, and Performance either show a bidirectional or unidirectional relation within and between each other.

5.4 Limitation and Recommendations

The findings highlight the complexity of the relationship between market structure, firm conduct, and performance in the Malaysian private hospital industry, emphasising the importance of healthy competition to address medical inflation and enhance industry competitiveness. This study, however, has not extensively examined the relationship between the rising cost and the level of competition in the private hospital industry. This suggested that there is room for further research to explore the relationship between rising costs and the level of competition within specific industries.

While the SCP paradigm is renowned for establishing causal relationships between Market Structure, Conduct, and Performance, it often overlooks key factors shaping market dynamics. Additionally, relying solely on financial data to examine these relationships may not achieve maximum accuracy. Therefore, future research is recommended to expand the study by incorporating other relevant variables such as policy interventions, non-price competition, and technological advancements, which are essential for understanding market behaviour within the industry.

5.5 Chapter Summary

In summary, a discussion of the link between market structure, conduct, and performance in Malaysia's private hospital business yields numerous major conclusions. The study acknowledges the significance of understanding the market structure in shaping the competitiveness of the private hospital business in Malaysia. Market features such as the number of enterprises, degree of product differentiation, and entrance obstacles are referred to as the market structure. This study indicates that the private hospital business in Malaysia has a monopolistic competition market structure with a moderate degree of market concentration. This shows that while hospitals face some competition, there is still space for differentiation and non-price competition to gain market share.

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APPENDICES

Appendix A: Extraction from EViews Panel Regression Analysis

Null Hypothesis: HHI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.436155	0.5429
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HHI)
Method: Least Squares
Date: 09/08/23 Time: 12:24
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HHI(-1)	-0.140656	0.097939	-1.436155	0.1691
C	168.7676	322.2507	0.523715	0.6072

R-squared	0.108199	Mean dependent var	-213.4453
Adjusted R-squared	0.055740	S.D. dependent var	815.0803
S.E. of regression	792.0384	Akaike info criterion	16.28640
Sum squared resid	10664522	Schwarz criterion	16.38581
Log likelihood	-152.7208	Hannan-Quinn criter.	16.30322
F-statistic	2.062542	Durbin-Watson stat	1.676886
Prob(F-statistic)	0.169105		

Figure 1: Unit Root Test (At Level) (HHI)

Null Hypothesis: MED_INF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.465936	0.5285
Test critical values:	1% level	-3.831511	
	5% level	-3.052169	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MED_INF)
Method: Least Squares
Date: 08/18/23 Time: 11:54
Sample (adjusted): 2003 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MED_INF(-1)	-0.132044	0.090075	-1.465936	0.1609
C	14.89243	9.578213	1.554823	0.1384

R-squared	0.112224	Mean dependent var	0.963158
Adjusted R-squared	0.060002	S.D. dependent var	5.422915
S.E. of regression	5.257707	Akaike info criterion	6.256568
Sum squared resid	469.9392	Schwarz criterion	6.355982
Log likelihood	-57.43739	Hannan-Quinn criter.	6.273393
F-statistic	2.148969	Durbin-Watson stat	1.468250
Prob(F-statistic)	0.160918		

Figure 2: Unit Root Test (At Level) (Medical Inflation)

Null Hypothesis: D(HHI) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.667223	0.0154
Test critical values:	1% level	-3.886751	
	5% level	-3.052169	
	10% level	-2.666593	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 17

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(HHI,2)
Method: Least Squares
Date: 08/18/23 Time: 11:55
Sample (adjusted): 2005 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(HHI(-1))	-1.227751	0.334790	-3.667223	0.0025
D(HHI(-1),2)	0.400346	0.250850	1.595959	0.1328
C	-281.0435	221.1284	-1.270952	0.2245

R-squared	0.514021	Mean dependent var	27.00294
Adjusted R-squared	0.444596	S.D. dependent var	1126.766
S.E. of regression	839.7273	Akaike info criterion	16.46282
Sum squared resid	9871988.	Schwarz criterion	16.60985
Log likelihood	-136.9339	Hannan-Quinn criter.	16.47743
F-statistic	7.403921	Durbin-Watson stat	2.214041
Prob(F-statistic)	0.006402		

Figure 3: Unit Root Test (First Differences) (HHI)

Null Hypothesis: D(MED_INF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.050765	0.0490
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 18

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(MED_INF,2)
Method: Least Squares
Date: 08/18/23 Time: 11:55
Sample (adjusted): 2004 2021
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MED_INF(-1))	-0.744152	0.243923	-3.050765	0.0076
C	0.650349	1.339690	0.485447	0.6339

R-squared	0.367768	Mean dependent var	-0.188889
Adjusted R-squared	0.328254	S.D. dependent var	6.787089
S.E. of regression	5.562708	Akaike info criterion	6.374486
Sum squared resid	495.0995	Schwarz criterion	6.473416
Log likelihood	-55.37038	Hannan-Quinn criter.	6.388127
F-statistic	9.307166	Durbin-Watson stat	1.998939
Prob(F-statistic)	0.007627		

Figure 4: Unit Root Test (First Differences) (Medical Inflation)

Date: 08/18/23 Time: 11:22
Sample (adjusted): 2004 2021
Included observations: 18 after adjustments
Trend assumption: Linear deterministic trend
Series: HHI MED_INF
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.433730	13.05422	15.49471	0.1128
At most 1	0.144912	2.817908	3.841465	0.0932

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.433730	10.23631	14.26460	0.1969
At most 1	0.144912	2.817908	3.841465	0.0932

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

HHI	MED_INF
-0.001588	-0.161703
-0.000814	-0.170052

Unrestricted Adjustment Coefficients (alpha):

D(HHI)	489.4639	116.6800
D(MED_INF)	-2.991974	0.851329

1 Cointegrating Equation(s): Log likelihood -190.4028

Normalized cointegrating coefficients (standard error in parentheses)

HHI	MED_INF
1.000000	101.8064
	(14.9108)

Adjustment coefficients (standard error in parentheses)

D(HHI)	-0.777435
	(0.27073)
D(MED_INF)	0.004752
	(0.00173)

Figure 5: Sample of Cointegration Test

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 08/18/23 Time: 11:29
Sample: 2002 2021
Included observations: 19

Dependent variable: HHI

Excluded	Chi-sq	df	Prob.
MED_INF	5.889701	2	0.0526
All	5.889701	2	0.0526

Dependent variable: MED_INF

Excluded	Chi-sq	df	Prob.
HHI	6.227141	2	0.0444
All	6.227141	2	0.0444

Figure 6: Sample of VAR Granger Causality test

Dependent Variable: HHI
Method: Panel Least Squares
Date: 09/14/23 Time: 10:09
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHARE	0.459754	0.006333	72.60189	0.0000
CAP	4.15E-05	0.000119	0.348848	0.7273
ROA	-0.001325	0.002364	-0.560784	0.5751
ROS	-0.001127	0.000781	-1.442950	0.1495
C	-0.005712	0.000620	-9.219452	0.0000

Root MSE	0.013109	R-squared	0.892474
Mean dependent var	0.007601	Adjusted R-squared	0.891798
S.D. dependent var	0.040007	S.E. of regression	0.013160
Akaike info criterion	-5.815489	Sum squared resid	0.110147
Schwarz criterion	-5.780676	Log likelihood	1868.864
Hannan-Quinn criter.	-5.801977	F-statistic	1319.716
Durbin-Watson stat	0.749076	Prob(F-statistic)	0.000000

Figure 7: Sample of Panel Ordinary Least Square Estimation (HHI)

Dependent Variable: HHI
Method: Panel Least Squares
Date: 09/15/23 Time: 21:08
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHARE	0.536071	0.006332	84.66492	0.0000
CAP	9.15E-05	9.96E-05	0.918444	0.3588
ROA	-0.005323	0.002221	-2.396985	0.0169
ROS	-0.000380	0.000703	-0.540213	0.5893
C	-0.007743	0.000467	-16.56814	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.008380	R-squared	0.956062
Mean dependent var	0.007601	Adjusted R-squared	0.949333
S.D. dependent var	0.040007	S.E. of regression	0.009005
Akaike info criterion	-6.457708	Sum squared resid	0.045009
Schwarz criterion	-5.858924	Log likelihood	2155.696
Hannan-Quinn criter.	-6.225308	F-statistic	142.0756
Durbin-Watson stat	1.236856	Prob(F-statistic)	0.000000

Figure 8: Sample of Fixed Effect Estimation (HHI)

Dependent Variable: HHI
Method: Panel EGLS (Cross-section random effects)
Date: 09/15/23 Time: 21:08
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SHARE	0.519224	0.006030	86.10533	0.0000
CAP	9.27E-05	9.28E-05	0.999070	0.3181
ROA	-0.003822	0.002069	-1.847498	0.0651
ROS	-0.000641	0.000626	-1.022628	0.3069
C	-0.006623	0.000987	-6.710513	0.0000

Effects Specification	S.D.	Rho
Cross-section random	0.007714	0.4232
Idiosyncratic random	0.009005	0.5768

Weighted Statistics			
Root MSE	0.009325	R-squared	0.915650
Mean dependent var	0.002146	Adjusted R-squared	0.915120
S.D. dependent var	0.032102	S.E. of regression	0.009361
Sum squared resid	0.055735	F-statistic	1726.010
Durbin-Watson stat	1.089013	Prob(F-statistic)	0.000000

Unweighted Statistics			
R-squared	0.876951	Mean dependent var	0.007601
Sum squared resid	0.126049	Durbin-Watson stat	0.481530

Figure 9: Sample of Random Effect Estimation (HHI)

Dependent Variable: SHARE
Method: Panel Least Squares
Date: 09/14/23 Time: 09:07
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	0.002718	0.004856	0.559598	0.5760
ROS	0.002863	0.001604	1.785248	0.0747
CAP	-0.000110	0.000245	-0.449019	0.6536
HHI	1.940891	0.026733	72.60189	0.0000
C	0.014268	0.001232	11.58416	0.0000

Root MSE	0.026934	R-squared	0.892814
Mean dependent var	0.028870	Adjusted R-squared	0.892140
S.D. dependent var	0.082331	S.E. of regression	0.027039
Akaike info criterion	-4.375277	Sum squared resid	0.464997
Schwarz criterion	-4.340464	Log likelihood	1407.276
Hannan-Quinn criter.	-4.361765	F-statistic	1324.399
Durbin-Watson stat	0.504634	Prob(F-statistic)	0.000000

Figure 10: Sample of Panel Ordinary Least Square (SHARE)

Dependent Variable: SHARE
Method: Panel Least Squares
Date: 09/15/23 Time: 16:53
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015370	0.000793	19.38686	0.0000
CAP	-0.000160	0.000179	-0.896497	0.3704
HHI	1.731370	0.020450	84.66492	0.0000
ROA	0.011287	0.003983	2.834256	0.0048
ROS	0.001050	0.001263	0.831332	0.4061

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.015059	R-squared	0.966491
Mean dependent var	0.028870	Adjusted R-squared	0.961359
S.D. dependent var	0.082331	S.E. of regression	0.016184
Akaike info criterion	-5.285307	Sum squared resid	0.145368
Schwarz criterion	-4.686523	Log likelihood	1779.941
Hannan-Quinn criter.	-5.052907	F-statistic	188.3274
Durbin-Watson stat	0.930956	Prob(F-statistic)	0.000000

Figure 11: Sample of Fixed Effect Estimation (SHARE)

Dependent Variable: SHARE
Method: Panel EGLS (Cross-section random effects)
Date: 09/15/23 Time: 17:04
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013207	0.002321	5.689690	0.0000
CAP	-0.000164	0.000171	-0.959867	0.3375
HHI	1.748662	0.020186	86.62647	0.0000
ROA	0.009673	0.003820	2.532019	0.0116
ROS	0.001400	0.001169	1.197337	0.2316

Effects Specification	S.D.	Rho
Cross-section random	0.019367	0.5888
Idiosyncratic random	0.016184	0.4112

Weighted Statistics			
Root MSE	0.016264	R-squared	0.921619
Mean dependent var	0.006737	Adjusted R-squared	0.921126
S.D. dependent var	0.058037	S.E. of regression	0.016328
Sum squared resid	0.169558	F-statistic	1869.545
Durbin-Watson stat	0.836715	Prob(F-statistic)	0.000000

Unweighted Statistics			
R-squared	0.883001	Mean dependent var	0.028870
Sum squared resid	0.507565	Durbin-Watson stat	0.279515

Figure 12: Sample of Random Effect (SHARE)

Dependent Variable: CAP
Method: Panel Least Squares
Date: 02/15/24 Time: 15:19
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.990305	0.204997	9.708965	0.0000
HHI	4.605536	13.20211	0.348848	0.7273
SHARE	-2.884977	6.425073	-0.449019	0.6536
ROS	-1.866995	0.249801	-7.473927	0.0000
ROA	-0.111246	0.787211	-0.141317	0.8877

Root MSE	4.364871	R-squared	0.100804
Mean dependent var	2.000468	Adjusted R-squared	0.095149
S.D. dependent var	4.606630	S.E. of regression	4.381995
Akaike info criterion	5.800655	Sum squared resid	12212.39
Schwarz criterion	5.835468	Log likelihood	-1854.110
Hannan-Quinn criter.	5.814167	F-statistic	17.82468
Durbin-Watson stat	1.606602	Prob(F-statistic)	0.000000

Figure 13: Sample of Panel Ordinary Least Square (CAP)

Dependent Variable: CAP
Method: Panel Least Squares
Date: 02/15/24 Time: 15:20
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.138193	0.225800	9.469417	0.0000
HHI	16.59376	18.06725	0.918444	0.3588
SHARE	-9.013069	10.05365	-0.896497	0.3704
ROS	-0.086803	0.299489	-0.289836	0.7721
ROA	-0.108452	0.950729	-0.114072	0.9092

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	3.569359	R-squared	0.398699
Mean dependent var	2.000468	Adjusted R-squared	0.306608
S.D. dependent var	4.606630	S.E. of regression	3.835948
Akaike info criterion	5.650980	Sum squared resid	8166.546
Schwarz criterion	6.249764	Log likelihood	-1725.139
Hannan-Quinn criter.	5.883380	F-statistic	4.329398
Durbin-Watson stat	2.086560	Prob(F-statistic)	0.000000

Figure 14: Sample of Fixed Effect Estimation (CAP)

Dependent Variable: CAP
Method: Panel EGLS (Cross-section random effects)
Date: 09/15/23 Time: 16:13
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.226700	0.270512	8.231422	0.0000
ROS	-1.528669	0.239721	-6.376870	0.0000
ROA	-0.020463	0.805550	-0.025402	0.9797
SHARE	-6.034220	7.406077	-0.814766	0.4155
HHI	11.96456	14.19083	0.843119	0.3995

Effects Specification

	S.D.	Rho
Cross-section random	1.646970	0.1556
Idiosyncratic random	3.835948	0.8444

Weighted Statistics

Root MSE	4.065118	R-squared	0.066552
Mean dependent var	1.318775	Adjusted R-squared	0.060681
S.D. dependent var	4.244759	S.E. of regression	4.081066
Sum squared resid	10592.64	F-statistic	11.33619
Durbin-Watson stat	1.788183	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.095258	Mean dependent var	2.000468
Sum squared resid	12287.72	Durbin-Watson stat	1.541505

Figure 15: Sample of Random Effect Estimation (CAP)

Dependent Variable: ROS
Method: Panel Least Squares
Date: 09/13/23 Time: 14:56
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROA	1.230651	0.109422	11.24679	0.0000
CAP	-0.043245	0.005786	-7.473927	0.0000
SHARE	1.741633	0.975570	1.785248	0.0747
HHI	-2.894831	2.006190	-1.442950	0.1495
C	-0.052682	0.033366	-1.578901	0.1149

Root MSE	0.664306	R-squared	0.256041
Mean dependent var	-0.034980	Adjusted R-squared	0.251362
S.D. dependent var	0.770784	S.E. of regression	0.666912
Akaike info criterion	2.035453	Sum squared resid	282.8749
Schwarz criterion	2.070266	Log likelihood	-647.3627
Hannan-Quinn criter.	2.048965	F-statistic	54.72158
Durbin-Watson stat	1.418214	Prob(F-statistic)	0.000000

Figure 16: Sample of Panel Ordinary Least Square Estimation (ROS)

Dependent Variable: ROS
Method: Panel Least Squares
Date: 09/15/23 Time: 11:21
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.129531	0.034048	-3.804333	0.0002
ROA	1.205081	0.124654	9.667401	0.0000
CAP	-0.001743	0.006015	-0.289836	0.7721
SHARE	1.184628	1.424975	0.831332	0.4061
HHI	-1.383924	2.561811	-0.540213	0.5893

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.505859	R-squared	0.568608
Mean dependent var	-0.034980	Adjusted R-squared	0.502539
S.D. dependent var	0.770784	S.E. of regression	0.543641
Akaike info criterion	1.743214	Sum squared resid	164.0278
Schwarz criterion	2.341998	Log likelihood	-472.7002
Hannan-Quinn criter.	1.975615	F-statistic	8.606277
Durbin-Watson stat	2.050477	Prob(F-statistic)	0.000000

Figure 17: Sample of Fixed Effect Estimation (ROS)

Dependent Variable: ROS
Method: Panel EGLS (Cross-section random effects)
Date: 09/15/23 Time: 11:26
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.142977	0.046633	-3.066009	0.0023
ROA	1.296752	0.109495	11.84298	0.0000
CAP	-0.030076	0.005303	-5.671683	0.0000
SHARE	1.888379	1.134518	1.664476	0.0965
HHI	-2.667813	2.135384	-1.249336	0.2120

Effects Specification

	S.D.	Rho
Cross-section random	0.310995	0.2466
Idiosyncratic random	0.543641	0.7534

Weighted Statistics

Root MSE	0.596091	R-squared	0.205415
Mean dependent var	-0.033744	Adjusted R-squared	0.200418
S.D. dependent var	0.670746	S.E. of regression	0.598429
Sum squared resid	227.7626	F-statistic	41.10449
Durbin-Watson stat	1.640876	Prob(F-statistic)	0.000000

Unweighted Statistics

R-squared	0.244337	Mean dependent var	-0.034980
Sum squared resid	287.3252	Durbin-Watson stat	1.300722

Figure 18: Sample of Random Effect Estimation (ROS)

Dependent Variable: ROA
Method: Panel Least Squares
Date: 09/14/23 Time: 08:55
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CAP	-0.000282	0.001997	-0.141317	0.8877
SHARE	0.181088	0.323604	0.559598	0.5760
HHI	-0.372860	0.664892	-0.560784	0.5751
ROS	0.134799	0.011986	11.24679	0.0000
C	0.064591	0.010764	6.000617	0.0000

Root MSE	0.219859	R-squared	0.185166
Mean dependent var	0.061704	Adjusted R-squared	0.180041
S.D. dependent var	0.243753	S.E. of regression	0.220722
Akaike info criterion	-0.176058	Sum squared resid	30.98471
Schwarz criterion	-0.141245	Log likelihood	61.42661
Hannan-Quinn criter.	-0.162546	F-statistic	36.13174
Durbin-Watson stat	0.556306	Prob(F-statistic)	0.000000

Figure 19: Sample of Panel Ordinary Least Square Estimation (ROA)

Dependent Variable: ROA
Method: Panel Least Squares
Date: 09/15/23 Time: 16:38
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.044462	0.010700	4.155312	0.0000
CAP	-0.000216	0.001895	-0.114072	0.9092
ROS	0.119597	0.012371	9.667401	0.0000
SHARE	1.264004	0.445974	2.834256	0.0048
HHI	-1.925052	0.803114	-2.396985	0.0169

Effects Specification

Cross-section fixed (dummy variables)

Root MSE	0.159361	R-squared	0.571901
Mean dependent var	0.061704	Adjusted R-squared	0.506337
S.D. dependent var	0.243753	S.E. of regression	0.171263
Akaike info criterion	-0.566959	Sum squared resid	16.27879
Schwarz criterion	0.031825	Log likelihood	267.7103
Hannan-Quinn criter.	-0.334558	F-statistic	8.722707
Durbin-Watson stat	1.019901	Prob(F-statistic)	0.000000

Figure 20: Sample of Fixed Effect Estimation (ROA)

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 09/15/23 Time: 16:41
Sample: 2002 2021
Periods included: 20
Cross-sections included: 82
Total panel (unbalanced) observations: 655
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.062276	0.018784	3.315408	0.0010
CAP	2.65E-05	0.001761	0.015070	0.9880
ROS	0.117385	0.010943	10.72705	0.0000
SHARE	0.848875	0.389877	2.177289	0.0298
HHI	-1.268920	0.720149	-1.762024	0.0785

Effects Specification	S.D.	Rho
Cross-section random	0.142248	0.4082
Idiosyncratic random	0.171263	0.5918

Weighted Statistics			
Root MSE	0.172095	R-squared	0.169582
Mean dependent var	0.023202	Adjusted R-squared	0.164359
S.D. dependent var	0.188953	S.E. of regression	0.172770
Sum squared resid	18.98431	F-statistic	32.46973
Durbin-Watson stat	0.870192	Prob(F-statistic)	0.000000

Unweighted Statistics			
R-squared	0.170967	Mean dependent var	0.061704
Sum squared resid	31.52463	Durbin-Watson stat	0.524035

Figure 21: Sample of Random Effect Estimation (ROA)

Pairwise Granger Causality Tests
Date: 07/12/23 Time: 00:58
Sample: 2002 2021
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
SHARE does not Granger Cause HHI	655	88.5974	1.E-19
HHI does not Granger Cause SHARE		102.574	3.E-22
CAP does not Granger Cause HHI	655	0.00046	0.9829
HHI does not Granger Cause CAP		0.07041	0.7908
ROS does not Granger Cause HHI	655	0.11829	0.7310
HHI does not Granger Cause ROS		0.25934	0.6108
ROA does not Granger Cause HHI	655	0.01588	0.8998
HHI does not Granger Cause ROA		0.07298	0.7871
CAP does not Granger Cause SHARE	655	0.13141	0.7171
SHARE does not Granger Cause CAP		0.04806	0.8266
ROS does not Granger Cause SHARE	655	0.05004	0.8231
SHARE does not Granger Cause ROS		0.90879	0.3408
ROA does not Granger Cause SHARE	655	0.01142	0.9150
SHARE does not Granger Cause ROA		0.15381	0.6951
ROS does not Granger Cause CAP	655	15.0379	0.0001
CAP does not Granger Cause ROS		32.3009	2.E-08
ROA does not Granger Cause CAP	655	0.04313	0.8356
CAP does not Granger Cause ROA		3.27259	0.0710
ROA does not Granger Cause ROS	655	28.6379	1.E-07
ROS does not Granger Cause ROA		0.67752	0.4108

Figure 22: Sample of Granger Causality test