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**RELATIONSHIP OF INVENTORY TURNOVER AND GROSS
MARGIN RETURN ON INVENTORY INVESTMENT
(GMROII) OF MANUFACTURING IN MALAYSIA PUBLIC
LISTED COMPANIES.**

CHAI JIA YUN



**SCHOOL OF TECHNOLOGY MANAGEMENT AND LOGISTICS
COLLEGE OF BUSINESS
UNIVERSITI UTARA MALAYSIA
2023**

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LISTED COMPANIES.**

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This research paper is submitted in partial fulfillment of
the requirement for the Master of
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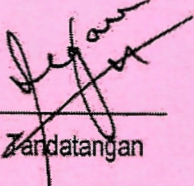
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For my beloved Dad, Mum and Supervisor



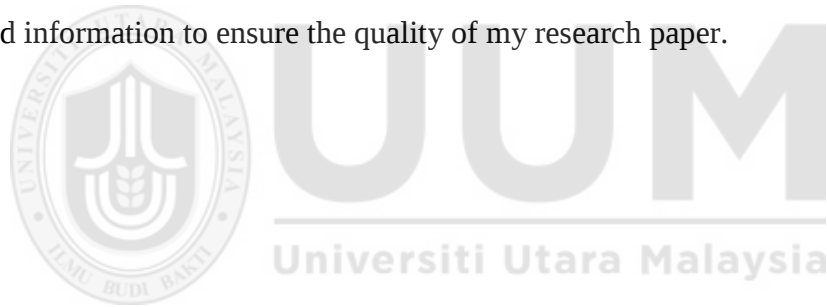
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ABSTRACT

This comprehensive study delved deeply into the interplay between inventory turnover and gross margin return on inventory investment (GMROII) within the context of manufacturing sector companies listed in the Malaysia. Effective inventory management was undeniably a cornerstone of business operations, profoundly influencing financial performance and operational efficiency. As such, a nuanced understanding of the intricate relationship between inventory turnover and GMROII assumed paramount significance, offering invaluable insights for informed and strategic decision-making. Employing a rigorously quantitative approach, this research harnessed secondary data derived from the financial records of manufacturing companies spanning a defined temporal horizon. Through meticulous data analyses, the researcher endeavored to illuminate the intensity and directionality of the correlation between these pivotal variables, encapsulated within a cohort of 260 publicly listed manufacturing enterprises. The discerning findings of this study illuminated distinctive trends across various sectors. Notably, consumer products, healthcare, and technology sectors exhibited a promising convergence of favorable inventory turnover and robust GMROII. In contrast, sectors like construction and transportation manifested commendable inventory turnover, albeit with comparatively lower GMROII. Intriguingly, the property sector surfaced with relatively diminished investment potential and profitability. The culmination of a meticulous analysis of 260 publicly listed manufacturing companies in Malaysia unequivocally underscored the salient premise that augmenting inventory turnover could invariably catalyze heightened profitability. It resoundingly highlighted the pivotal role that effective inventory management assumed within the expansive landscape of the manufacturing sector.

Keywords: Inventory turnover, GMROII, Manufacturing sector, Public listed company Malaysia, Secondary data.

ABSTRAK

Kajian komprehensif ini menyelami dengan mendalam interaksi antara pusingan inventori dan pulangan margin kasar pelaburan inventori (GMROII) dalam konteks syarikat sektor pembuatan yang disenaraikan di Malaysia. Pengurusan inventori yang berkesan adalah tanpa keraguan asas operasi perniagaan, yang mempengaruhi prestasi kewangan dan kecekapan operasi secara mendalam. Oleh itu, pemahaman yang halus mengenai hubungan rumit antara pusingan inventori dan GMROII telah mendapat kepentingan utama, menawarkan pandangan yang berharga untuk membuat keputusan yang berinformasi dan strategik. Melalui pendekatan kuantitatif yang ketat, penyelidikan ini menggunakan data sekunder yang diperoleh daripada rekod kewangan syarikat pembuatan yang meliputi jangka masa yang ditentukan. Melalui analisis data yang teliti, penyelidik berusaha untuk menerangi intensiti dan arah hubungan antara pemboleh ubah penting ini, yang terperangkap dalam kohort 260 perusahaan pembuatan yang disenaraikan secara awam. Dapatan kajian yang bijak menyinari trend yang berbeza di pelbagai sektor. Secara mencolok, produk pengguna, kesihatan, dan sektor teknologi menunjukkan konvergensi yang menjanjikan antara pusingan inventori yang baik dan GMROII yang kukuh. Sebaliknya, sektor pembinaan dan pengangkutan menunjukkan pusingan inventori yang baik, walaupun dengan GMROII yang lebih rendah secara berbanding. Dengan menariknya, sektor harta tanah muncul dengan potensi pelaburan dan keuntungan yang relatif berkurang. Akhirnya, analisis teliti terhadap 260 syarikat pembuatan yang disenaraikan secara awam di Malaysia dengan tegas menekankan bahawa meningkatkan pusingan inventori dapat memacu keuntungan yang lebih tinggi. Ini dengan jelas menyoroti peranan penting yang dimainkan oleh pengurusan inventori yang berkesan dalam landskap yang luas dalam sektor pembuatan.

Kata Kunci: *Pusingan inventori, GMROII, Sektor pembuatan, Syarikat disenaraikan awam Malaysia, Data sekunder.*

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CHAPTER 1: INTRODUCTION

1.1 Background of Study

Inventory was a stock item used to meet future demands by firms in the industry. The inventory list could be classified into three parts: raw materials, work in progress, and finished goods in the industry. According to Dulaime & Emar (2019), inventory management was a continuous process of organizing, planning, and controlling inventory in the industry. Therefore, each manufacturer or company needed to plan inventory management effectively and efficiently to ensure the organisation's stock data was always accurate. Simultaneously, inventory management could provide assurance of their inventory in the industry while managing their inventory management in the industry.

Some companies or manufacturers lacked inventory management in their industries, such as inaccurate inventory, excess material, insufficient storage capacity, and material shortages. According to Nnamdi (2018), most companies faced inventory management problems because they did not develop efficient strategies to manage their inventory. To implement inventory management, the company had to first identify its capabilities. Second, companies needed to identify and analyze existing resources in the organisation. Most importantly, the company always needed to monitor and control its inventory management to ensure it could minimize inventory management problems, especially material shortages.

Usually, the warehouse department played an essential role in managing inventory management in the organisation. Most details were where the items or materials were in stock. According to Samir Yerpude (2018), for the entire supply chain management, the company needed a professional employee who could store the inventory temporarily to commit to certain transactional needs for consolidation and shipment, which was called the warehouse. Each organisation would only hold the items easily with the warehouse department's help. The inventory management practice handled by the warehouse department would take care of the supply and lead time of logistics in the organisation (Samir Yerpude, 2018). If the inventory management was without the warehouse department's help, the organisation would face complex issues. For instance, the company that wanted to locate any product in the store would need help because the company had to do a detailed search manually in all available resources

in the storeroom. Simultaneously, it would require the company to put in a lot of effort and waste company time to avoid doing another task (Tejesh & Neeraja, 2018).

When talking about inventory performance, each company had to track or monitor daily, weekly, or even monthly (Hohenstein, 2022). For example, suppose material shortage or excess material issues appeared in the company's global supply chain. In that case, it would reflect that the company needed proper skills or strategies to optimize its inventory management level. Besides, inventory performance could be tracked in two site areas, such as internal and external (Karim, Nawawi & Salin, 2018). How did the inventory performance track in the organisation? And why was inventory performance needed to be tracked in the organisation? From these points, tracking or monitoring inventory performance was essential for the company to optimize inventory levels, reduce risk, enhance customer satisfaction, and increase profitability (Eveline, Kitheka, Charles, Hames & Abeid, 2019). To ensure that inventory performance could work effectively and efficiently in the organisation, the company could achieve its business goals by using inventory performance metrics.

There were many methods to calculate inventory management with accuracy in the organisation (Al-Rushood, Rahbar & Dweiri, 2020; Singh, Ghosh, Saraf & Nayak, 2020). For instance, the day of supply, week on hand, and other methods could be used for category inventory management. One good formula that a company could apply to measure inventory management was the inventory turnover ratio. Inventory was daily items frequently used by the company to measure the manufacturing process, production output, items shipped, and others (Kwak, 2019). Besides, the inventory turnover ratio could inform the company how fast the material moved out from the organisation. Simultaneously, the company would know where they should start replenishing the fabric to avoid material shortage issues.

1.2 Research Motivation

The motivation for the researcher's focus on this topic was to gain a deeper understanding of the efficiency and profitability of inventory management in manufacturing Malaysia public listed companies. The objective of the researcher was to randomly select ten listed companies under five years for inventory turnover analysis in research because it allowed the researcher to gain valuable insight into inventory management and facilitate more informed decision-making in a business environment. Therefore, the researcher used inventory management metrics, such as inventory turnover, to support the research topic. According to Azmal, Negoro & Syah (2019), the formula inventory turnover ratio was used, with cost of goods sold divided by the average inventory. Usually, the company would use the inventory turnover ratio to measure how well it generated sales from its stock. When the company wanted data to calculate the inventory turnover ratio against inventory management, it needed to have a financial report. In this paper, the researcher obtained the annual report from Bursa Malaysia and randomly chose ten listed companies to support the fact. More or less, the researcher chose the latest five years of annual reports between 10 listed companies in the paper. Based on Figure 1.1, it is shown that the researcher calculated the inventory turnover ratio between 10 listed companies to support the facts.

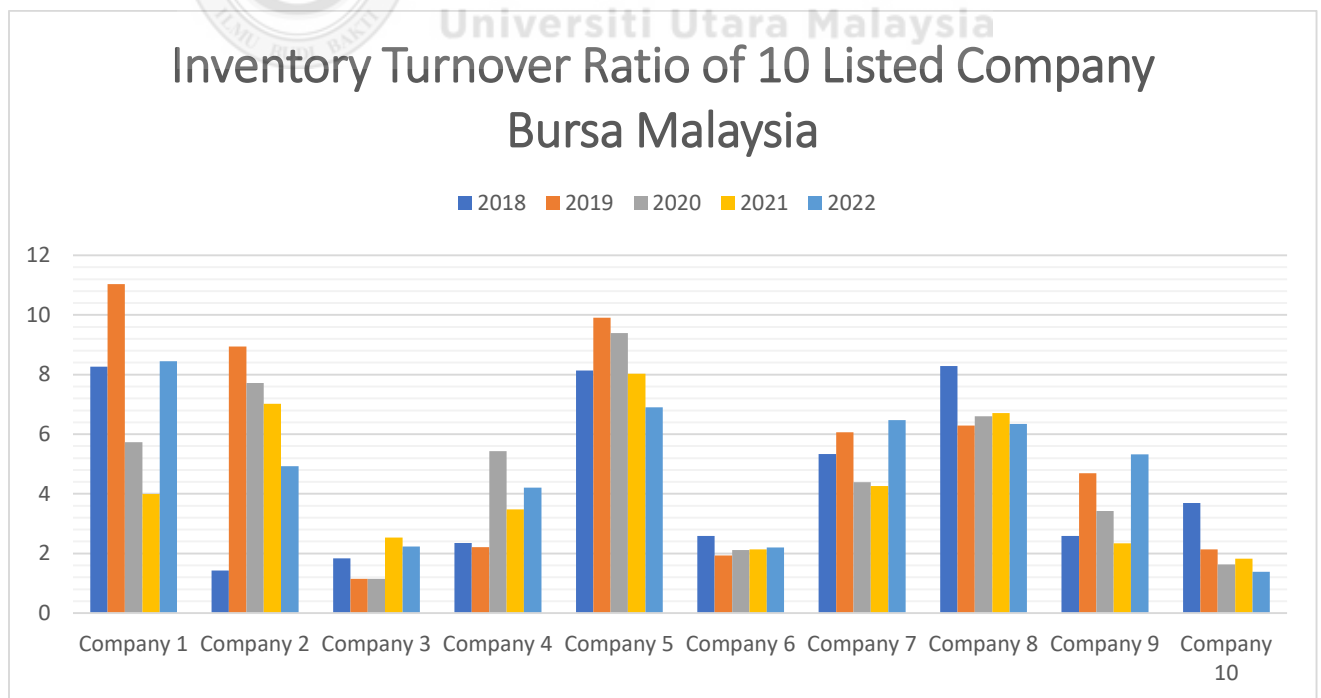


Figure 1.1: The statistics of inventory turnover of 10 listed company Bursa Malaysia.

Moreover, from Figure 1.1, the statistics showed the inventory turnover between 10 listed companies in Bursa Malaysia in 2018-2022. The inventory turnover ratio was higher, and it could control material effectively and efficiently in the organisation. Besides, when the lower inventory turnover ratio and lack of control of inventory level such as material shortage in warehouse management. The overall statistics inventory performance in Figure 1.1 showed that most listed companies' inventory performance was always significant in the five years.

In other words, a company's supply chain involved the point of origin to the point of consumption. It meant including the procurement of raw materials, manufacturing production to finished goods, distribution of finished goods, and delivery to the final customer's hand. Then, each company department played an essential role in ensuring efficiency and effectiveness success in supply chain management. Unfortunately, there was still a lot of uncertainty from different sources during the entire supply chain process, such as supply and demand, transportation, material, agency, etc. At the same time, the material was a central core used by the manufacturing company to solve the problem of uncertainty caused.

Besides, material issues were more significant if companies or manufacturers needed help managing their inventory. For example, if material issues arose in the organisation, the company would face material delay issues, and the production productivity would be low because the company had no uncertain material support for a production run on schedule. Besides, there were many strategies to overcome material issues in inventory management. In other words, there were many methods to overcome material problems to ensure that the overall performance inventory management could move smoothly, and the company could avoid some common issues in the industry. Therefore, this research identified the inventory performance of the manufacturing Malaysia public listed company by using specific inventory management KPIs such as inventory turnover and gross margin return on inventory investment (GMROI).

1.3 Problem Statement

In this study, the topic was a focused relationship between inventory turnover and gross margin return on inventory investment (GMROII) against manufacturing Malaysia public listed companies. The researcher wanted to understand how these two metrics were related to each other and how they impacted a company's performance (Atnafu & Balda, 2018), enhancing inventory management in the organisation. Simultaneously, it also sought to determine how the company's inventory turnover affected GMROII (Lin, Wang & Shi, 2022) and whether there was a relationship between these two metrics. Then, the researcher needed to identify the optimal level of inventory turnover that could lead to high GMROII and how the company could improve its inventory management after applying the inventory metrics.

In today's rapidly evolving organisational landscape, the currents of consumer demands and market trends shifted with unprecedented capriciousness (Kar, Tripathi, Malik, Gupta & Sivarajah, 2022). The pursuit of sustainability, profitability, and operational efficiency took center stage in an organisation. From these points, the organisation faced ever-intensifying competition and the constant challenges of catering to ever-shifting consumer preferences where strategic decision-making and agile adaptation were paramount.

Besides, the nuanced dance between inventory turnover and GMROII introduced a layer of complexity that underscored the balancing act organisation must act. By navigating through various product categories, the company could provide each with its unique profitability potential and sales momentum and demanded a multifaceted approach that transcended traditional business paradigms (Islam et al., 2022). At the same time, the company was not merely selling a product; they also crafted an experience and curated an assortment, and the companies needed to optimize their resource allocation in ways that harmonized with the diverse cadence of the product offering (Jameaba & Ssenyonga Jameaba, 2022).

While the company acknowledged the significance of optimizing the product assortment and allocating resources judiciously, pursuing a comprehensive and structured framework to attain that optimization had yet to be discovered (Borjian Yazdi, 2023). Then, the current void of intricate insights into specific strategies that could effectively enhance profitability and streamline operational efficiency within the distinct quadrants created by gross margin and turnover rates underscored the dire need for focused research in this critical domain.

Moreover, the company's need for complexity extended to the realm of inventory planning and resource allocation, where striking the proper equilibrium between revenue maximization and the smooth orchestration of operational processes posed a formidable challenge in the organisation (Choi, Narayanan, Novak, Olhager, Sheu & Wiengarten, 2021). At the same time, the existing gaps in comprehending how to precisely calibrate inventory levels, allotment of space, and distribution of resources to harmonize with the diverse characteristics of disparate product categories constituted a significant impediment to achieving operational excellence within the organisation.

Lastly, in light of these challenges, a comprehensive investigation into the strategic maneuvers and fine-tuned approaches that could bolster profitability and operational fluidity in each quadrant became imperative. Integrating advanced analytics, data-driven decision-making, and innovative supply chain management techniques emerged as potential avenues to address these gaps and facilitate the optimization of company operations (Tsai, Bui, Tseng, Ali, Lim & Chiu, 2021). As the industry's trajectory continued to evolve, this research endeavor stood poised to offer invaluable insights and actionable recommendations to retailers striving to navigate the intricacies of modern retail with understanding and success based on quadrant inventory turnover and GMROII determination.

This study specifically focused on the relationship between inventory metrics such as inventory turnover and gross margin return on inventory investment (GMROII) with the relevant information from the literature review. Also, 260 companies were selected as secondary data to help get more data or facts to support or cover this study topic based on manufacturing Malaysia's publicly listed companies from the manufacturing sector. It was because they had more experience, professionalism, and mastered strategies, skills, or knowledge to manage inventory management in the organisation.

1.4 Research Question

To find the reason for the relationship between inventory turnover and gross margin return on inventory investment (GMROII) of manufacturing in Malaysia public listed companies. These are two research questions related to this study topic's research objective.

Regarding the below, these have two research questions:

1. What are the trends of inventory turnover and gross margin return on inventory investment (GMROII) among manufacturing sector public listed companies in Malaysia?
2. How do manufacturing sector public listed companies in Malaysia improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII?

1.5 Research Objective

This study's research objectives are related to research questions to ensure that this paper fulfils the research question and objective.

Regarding the below, these have three research objectives:

1. To identify the trends of inventory turnover and gross margin return on inventory investment (GMROII) among manufacturing sector public listed companies in Malaysia.
2. To investigate the manufacturing sector public listed companies in Malaysia improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII.

1.6 Definition of Key Terms

- **Inventory-** Inventory is stock items to meet present or future customer demand (Song & Xue, 2007).
- **Inventory Management-** Inventory management is defined as its help to a company to identify which or how much stock to order at what time (Muller, 2011).
- **Inventory Metrics-** Inventory metrics are the quantitative measurement used to measure the organisation's inventory management performance (Zhu, Jaarsveld, van & Dekker, 2020).
- **Inventory Turnover-** Inventory turnover measures how often a company sells and replaces its inventory (Azmal et al., 2019).
- **Gross Margin Return on Inventory Investment (GMROII)-** GMROII measures the efficiency and profitability of inventory investment (Lin et al., 2022).



1.7 Significant of Study

At the end of the study, this paper was able to identify the relationship between inventory turnover and gross margin return on inventory investment (GMROII) of manufacturing in Malaysia public listed companies. Additionally, after this study, the company gained a better understanding of areas that require more attention and enhancement in terms of inventory management.

Furthermore, this study helped companies or manufacturers maximize their material levels and support production effectively as they entered the supply chain process management. Simultaneously, it also assisted companies or manufacturers in increasing profits by enabling them to control their inventory performance.

Lastly, this study increased people's knowledge about the quantitative research system. Each qualitative and quantitative method has its own way of completion and description for the topic being investigated or studied. This study provides more knowledge and an approach to conducting quantitative research, which can benefit students who are interested in such research methods.

1.8 Scope of Study

This study focused on manufacturing in Malaysia's public listed companies, particularly in the manufacturing sector. The researcher gathered secondary data from Bursa Malaysia. The collected secondary data provided inspiration for identifying trends in inventory performance using selected inventory metrics such as inventory turnover and gross margin return on inventory investment (GMROII) over the past ten years. It helped the researcher gain more detailed insights into how public listed companies controlled inventory efficiently and effectively within the organisation.

1.9 Organisation of Thesis OR Research

Chapter 1 introduced the inventory based on the previous literature review. It also studied the inventory metrics used to measure inventory in public listed companies within the organisation. For instance, the inventory turnover ratio served as a standard tool for assessing company inventory performance. The statistics presented in Figure 1.1 played an essential role in supporting the study's focus.

Chapter 2 focused more on the previous literature review, incorporating the researcher's studies and investigations. Additionally, Chapter 2 determined specific inventory metrics and explored their interrelationships concerning inventory management in Malaysia's public listed manufacturing companies.

Chapter 3 covered the methodology employed in this study, providing insights into effective and efficient data collection. Quantitative research predominantly relied on secondary data to address the research topic. Ensuring the accuracy of the research topic demanded consistent data accuracy.

Chapter 4 delved into the data analysis process to extract detailed insights related to the research topic, "RELATIONSHIP OF INVENTORY TURNOVER AND GROSS MARGIN RETURN ON INVENTORY INVESTMENT (GMROI) OF MANUFACTURING IN MALAYSIA PUBLIC LISTED COMPANIES." The references served as crucial data sources, bolstering the study's recommendations with robust evidence and facts, and ensuring accuracy throughout.

Chapter 5 encapsulated the discussion and conclusion of the study. This chapter not only summarized the research topic's findings but also offered commentary and perspectives. By inspiring and enlightening both companies and students, Chapter 5 aimed to deepen the understanding of the research topic.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Inventory management was an essential process for companies, involving the control and optimization of inventory levels to meet customer demand at the right time. It not only helped companies minimize costs but also maximize profitability. Inventory management also played a significant role in determining a company's financial performance. The use of relevant metrics was essential in accurately evaluating financial performance. Two critical inventory management metrics were turnover and gross margin return on inventory investment (GMROII). Then, inventory turnover measured the number of times a company sold and replaced its inventory in a period, usually a year. It was a simple and effective way to assess inventory management efficiency. On the other hand, GMROII was a metric that measured the profitability of a company's investment in inventory. This metric considered the gross margin generated by the sale of inventory and the cost of holding that inventory. By using these metrics, companies could identify areas of improvement in their inventory management and make data-driven decisions to optimize inventory levels. It could lead to enhanced financial performance for the organisation. This chapter aimed to provide a literature review of inventory performance and the use of inventory management metrics such as inventory turnover and GMROII. It also explored the relationship between these metrics and the manufacturing sector public listed company from Bursa Malaysia from a theoretical perspective in Figure 2.1.

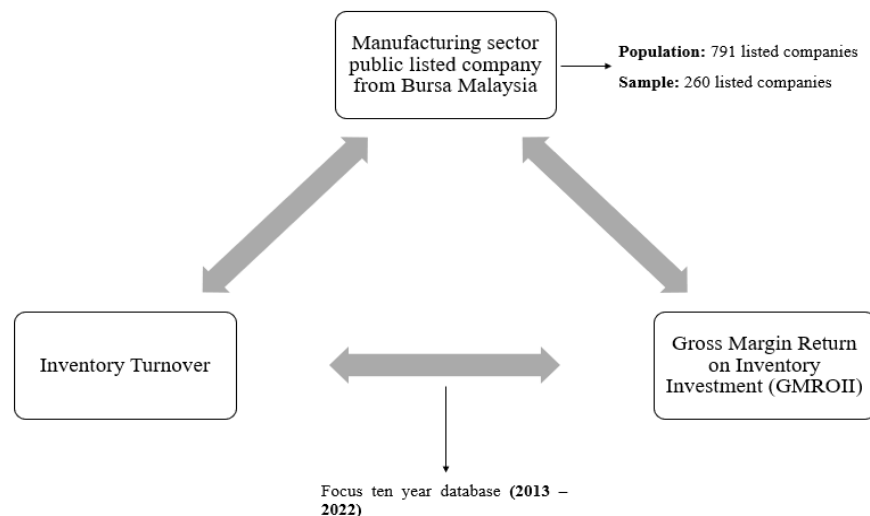


Figure 2.1: Research framework.

2.2 Literature Review

2.2.1 Inventory Turnover

The inventory turnover was a financial ratio used to evaluate inventory performance by measuring how many times the company sold and replaced inventory within a period (Azmal et al., 2019). A higher inventory turnover reflected more efficient management of the company's inventory performance, indicating that the company was selling inventory quickly and not holding stock for extended periods (Chandra & Juliawati, 2020). However, a low inventory turnover reflected that the company was holding inventory for an extended period, resulting in higher holding costs and obsolescence risks in the organisation (Breivik, Larsen, Thyholdt & Myrland, 2023).

According to Farooq (2019), a high inventory turnover had a positive association with better inventory performance in terms of reduced inventory holding costs. Usually, inventory holding costs referred to the expenses of maintaining inventory, such as warehousing, insurance, and storage costs in the organisation (Ekakitie, Kifordu & Nwaebuni, 2022; Odedairo, 2021). It was measured that the company was selling products quickly, reducing the need to hold excessive inventory levels. The company's profitability increased by reducing inventory holding costs after applying the accurate inventory management method (Muchaendepi et al., 2019). On the other hand, a low inventory turnover would influence the company to keep excessive inventory levels, which could increase holding costs and reduce profitability (Imhanzenobe, 2019).

According to Kwak (2019), inventory turnover also directly impacted a company's cash flow. Cash flow was the movement of funds in and out of the organisation. A high inventory turnover could make the company quickly sell the product, generating more revenue and freeing up cash to invest in other areas of the business (Boisjoly, Cornie & McDonal, 2020). It was because the company could improve cash flow and make it easier to meet financial obligations such as paying suppliers, creditors, and others (Egwu, Orugun & Adalakun, 2021). However, a low inventory turnover would make the company hold too much inventory, tying up cash and reducing the ability to meet its financial obligations (Patki, 2021).

According to Breivik (2019), inventory turnover was an essential metric for managing inventory in the organisation, which meant it could improve the company's inventory management. A high inventory turnover enabled a company to have an efficient and effective inventory management system in place. It meant the company could replenish inventory levels efficiently while selling products quickly (Mashud, Roy, Daryanto & Ali, 2020). From other points, it ensured the company had enough stock and could meet customer demand promptly. In terms of low inventory turnover, it determined the company had an inefficient and ineffective inventory management system in place, which would regularly face excessive inventory levels and the risk of stockout (Ekakitie et al., 2022).

According to Farooq (2019), inventory turnover could directly impact inventory performance regarding company profitability. As known, high inventory turnover could imply that a company was selling products quickly, generating more revenues or funds, and, most importantly, could reduce inventory holding costs in the organisation (Alkhyeli, Abdulla Alshehhi, Aldhaheri, Alhosani, Alsereidi, Al Breiki & Nobanee, 2021). From these points, it directly represented company profitability stabilizing. Then, a low inventory turnover also reduced company profitability (Farooq, 2019) because the company needed to have a proper strategy to manage its inventory level in the organisation (Alves, Lok, Luo & Hao, 2020).

In conclusion, inventory turnover was an essential metric for measuring inventory performance in the organisation. A high inventory turnover would help the company sell products quickly and efficiently, leading to reduced inventory holding costs, improved cash flow, better inventory management, and enhanced company profitability. On the other hand, a low inventory turnover would harm the company's inventory performance in terms of holding high inventory costs, unhealthy cash flow, poor inventory management, and lower profitability in the organisation. Therefore, the company had to maintain good inventory turnover to improve inventory performance and profitability.

2.2.2 Gross Margin Return on Inventory Investment (GMROII)

The gross margin return on inventory investment (GMROII) was a financial metric used to measure profitability on inventory investment (Lin et al., 2022). From other points, it was a ratio that calculated the gross margin earned on each fund invested in the inventory. Applying these metrics helped the company provide insight into the effectiveness and efficiency of the inventory investment and helped the business make informed decisions about inventory management in the organisation (Jaime Marulanda, 2019).

According to Lin et al. (2022), the gross margin return on inventory investment (GMROII) could impact inventory performance for better inventory management. It provided insight into the profitability of inventory investment by enabling businesses to make informed decisions about inventory management. A high ratio of GMROII would help the company earn a high gross margin on each fund invested in inventory, reflecting that the company managed inventory performance effectively and efficiently (Lawrence P. Grasso, 2022). At the same time, the GMROII could help the company make better decisions about inventory levels, pricing, or product selection that could enhance inventory management (Yang & Seong, 2021).

According to Mirha Mubarak, Sadiq & Syeda Fizze Abbas (2021), the gross margin return on inventory investment (GMROII) could impact inventory performance by focusing on increasing profitability. A high GMROII would indicate the company earned a high gross margin invested in the inventory because it ensured that it had the right product in stock place and that pricing was accurate or correct (Vologzhanin, 2018). From these points, the right way of managing inventory management led to high profitability in the organisation. On the other hand, a low GMROII would reduce the company's earnings and a high gross margin on each dollar invested in inventory because the way of managing inventory still needed improvement by the company (Jaime Marulanda, 2019).

According to Winn, Thompson & Zoghi (2021), the gross margin return on inventory investment (GMROII) could directly enhance the inventory performance of the company in terms of better productivity. Usually, a high GMROII could reflect that the company had to stock the right product, pricing accurate, and sold them efficiently (Ailawadi & Farris, 2017). From other points, it would show that companies always measured and evaluated their inventory management from time to time to avoid inventory issues happening in the

organisation. Then, a high GMROII helped a company increase sales, revenues, and profitability to achieve better productivity results in the organisation (Ailawadi & Farris, 2017). Conversely, a low GMROII reflected the company always faced inventory issues such as material overload or shortage.

According to Lin et al. (2022), the gross margin return on inventory investment (GMROII) was strongly connected with inventory turnover against inventory performance. Usually, a high GMROII would determine the company earned a high gross margin on each fund invested in inventory to enhance inventory turnover (Dikhtiaruk, 2021) because the company had managed inventory efficiently, such as ensuring the right product was in stock, and the pricing must correct. These points helped the company increase sales and faster inventory turnover. On the other hand, a low GMROII meant that a company was not earning a high gross margin on each fund invested in inventory because it slowed inventory turnover and poor inventory performance that a company faced in the organisation (Jaime Marulanda, 2019).

In conclusion, the gross margin return on inventory investment (GMROII) was an essential metric to measure inventory performance in the organisation. A high GMROII indicated that a company earned a high gross margin on each fund invested in inventory in terms of better inventory management, increasing profitability, better productivity, and was strongly connected with inventory turnover. However, a low GMROII would determine the company did not earn a high gross margin on each fund invested in inventory, resulting in poor inventory management, loss of profitability, poor productivity, and slow inventory turnover. Therefore, a suggestion was that a company must always maintain a high GMROII to improve its inventory performance.

2.2.3 The Relationship Inventory Turnover & Gross Margin Return on Inventory Investment (GMROII)

Inventory turnover and gross margin return on inventory investment (GMROII) were two financial metrics used to measure inventory performance in the organisation (Joseph, 2019). By focusing on the relationship between inventory turnover and the gross margin return on inventory investment (GMROII) against inventory performance, it was essential to understand the concept between these two inventory management metrics. The inventory turnover measured the number of times inventory was sold and replaced. In contrast, the gross margin return on inventory investment (GMROII) measured the gross margin earned on each fund invested in inventory. From these points, the focus was on the four types of relationships between inventory management metrics and inventory performance in the organisation.

According to Yu & Kim (2018), the first relationship between inventory turnover and GMROII against inventory performance was high inventory turnover and high GMROII. Assuming that when a company achieved high inventory turnover and high GMROII, the company efficiently managed inventory in the organisation. For instance, the company selling the product quickly generated a high earning margin on each sale (Doussard, Schrock, Wolf-Powers, Eisenburger & Marotta, 2018). At the same time, efficient inventory management enhanced better inventory management and increased profitability. Besides, high inventory turnover also determined that the company efficiently managed inventory levels to ensure that it had the right product in stock to prevent the risk of overstocking or understocking (Manguday, 2018).

According to Kylänlahti-harmaala (2020), the second relationship between inventory turnover and GMROII against inventory performance was low inventory turnover and high GMROII. It meant that the company focused on the product line when achieving low inventory turnover and high GMROII in inventory performance. For instance, the company sold a limited number of products and earned a high margin on each sale (Syam & Sharma, 2018). It was because the company had a unique product that commanded a high price in the market (Grashuis & Magnier, 2018). When the company focused on this strategy in inventory management, it might have lowered sales volume, but it could lead to better inventory performance and profitability.

According to Hilmola, Tolli & Panova (2019), the third relationship between inventory turnover and GMROII against inventory performance was high inventory turnover and low GMROII. Usually, the company achieved high inventory turnover and low GMROII when focusing on a price-driven market. For instance, the company sold the product at a low margin and made up for its volume (Weber & Schütte, 2019). It might have helped the company achieve better inventory performance, but it did not increase the product's profitability in the organisation. From these points, the company had to ensure its inventory performance effectively to avoid overstocking and understocking, which could impact the company's increased holding costs or lost sales.

According to Hilmola et al. (2019), the fourth relationship between inventory turnover and GMROII against inventory performance was low inventory turnover and low GMROII. When both came low in the period, it meant that the company had faced poor inventory performance because it did not sell its product quickly and could not earn a high margin on each sale (Macaulay, Merton, Ball & Evan, 2020). For instance, poor inventory performance could result from overstock, material shortage, incorrect pricing, or poor product selection (Hassan Murshid & Ismail, 2022). From these points, the company had to constantly analyze their inventory management practices to identify areas of improvement and implement changes to enhance inventory performance in the organisation.

2.3 Summary

In summary, the relationship between inventory turnover and gross margin return on inventory investment (GMROII) was a crucial tool that measured company inventory management and profitability in the organisation. Inventory turnover represented the number of times inventory was sold and replaced within the period. Then, the gross margin return on inventory investment (GMROII) measured the profitability of inventory investment by calculating the gross margin and average inventory investment. By analyzing the relationship between both inventory management metrics, the company could identify the chance to optimize inventory management strategy and maximize the organisation's financial performance.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

According to Baur (2011), quantitative research was a research strategy employed to deal with numbers, logic, or objectives. It involved a research process of collecting and analyzing numerical data. A quantitative study was a research undertaking that inspired the idea to investigate the study area, and it required assistance from the target respondents to complete the study (Nabi, Walmsley, Liñán, Akhtar & Neame, 2018). The quantitative analysis was carried out with the target respondents since they had a significant impact on the quantitative research (D'Souza, Forsyth & Blackwood, 2020).

The research protocol for the quantitative study outlined the plan for how the study should have been conducted (Bhide, Shah & Acharya, 2018). The main objective of the quantitative study was to answer the research question based on the researcher's design or development. The quantitative analysis provided evidence for the feasibility of the study, detailed accuracy, design methodology, analytical considerations, and how the quantitative research study would be conducted or evaluated (Bouikidis, 2018). These points demonstrated that the research needed to have a clear plan from the beginning until the end (Bonnell, 1994; Fritz & Vandermause, 2018) before starting the quantitative study.

Furthermore, the differentiation between quantitative and qualitative studies depended on how the researcher selected appropriate ways to complete their research study (Németh, Molnár, Bozóki, Wijaya, Inotai, Campbell & Kaló, 2019). The qualitative method was the approach the researcher used for collecting information about a specific company in the research study through interviews (Lobe, Morgan & Hoffman, 2020). Typically, the researcher selected the best options of the company to fulfill the requirement of the research topic. On the other hand, for the quantitative method, the researcher employed surveys to gather information from the respondents (Story & Tait, 2019). The researcher analyzed the survey segments and identified the target respondents for the research study topic. Therefore, this research study topic included several essential aspects of research methodologies, such as research design, quantitative methods, and data analysis.

Quantitative research encompassed different categorical methods to complete the study. It could utilize primary data or secondary data to conduct the study (Walliman, 2021). Primary data were collected from target respondents after the researcher designed the questionnaire (Thomas, Oenning & Goulart, 2018). This meant that the collected data were unique and distinct from that of other people. In contrast, secondary data involved the researcher using existing data to conduct the study (Atmowardoyo, 2018). Meanwhile, the data could be collected or generated from the system's database (Pollard, Johnson, Raffa, Celi, Marl & Badawi, 2018). From these points, this method could be referred to as pure-quantitative analysis, implying that the researcher would use a standardized and structured research instrument to gather data from a large sample of participants (Gillad, 2021). Concurrently, data analysis assisted the researcher in identifying patterns and trends among variables in the study through the use of statistical software.



3.2 Research Design

Research design constituted an approach or method employed by researchers to gather data or information for their research. When researchers obtained advantageous details, it aided them in achieving a more comprehensive analysis of their research topic. The information and data needed to be reliable and factual within the study. Additionally, conducting the information and data accurately was crucial for ensuring high-quality research, as these findings could serve as valuable references for future researchers. The research design employed the quantitative method for the study, signifying that the investigation involved secondary data. Figure 3.1 illustrated the data collection method, differentiating between primary and secondary sources, as carried out in the study (Leening, Kavousi, Heeringa & Rooji, 2012). Furthermore, the information and data were collected through the database system from Bursa Malaysia, as all listed companies uploaded their documentation to facilitate easy access for viewers. Consequently, throughout the research study, the researcher generated data from Bursa Malaysia and formulated a trend analysis to identify variables that could substantiate the research topic in the study.

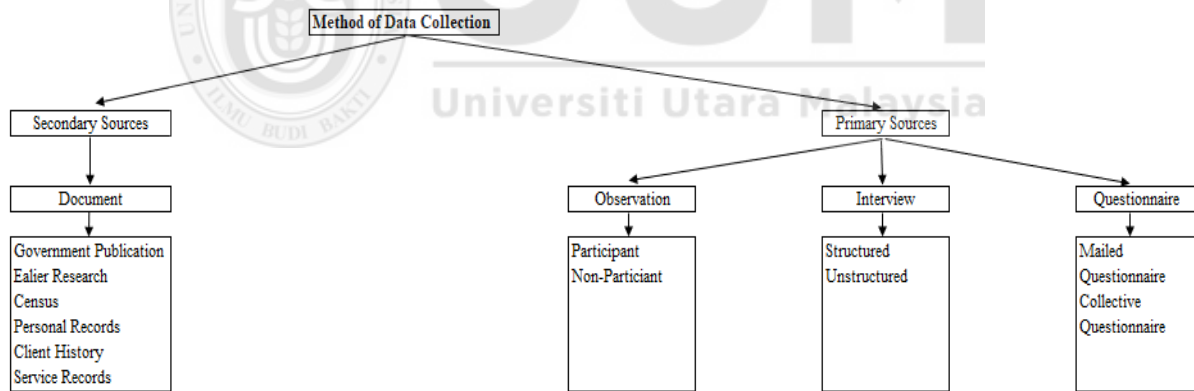


Figure 3.1: The method of data collection (Leening et al., 2012).

3.3 Quantitative Methodology

3.3.1 Sample Selection

Sample selection involved a carefully designed process by the researcher to ensure that the study represented the target population adequately, yielding meaningful results with sufficient statistical significance. The sample size was determined through an analysis based on expected effect size and alpha level, employing random sampling techniques to select participants from a pool of eligible individuals. This pool included well-defined inclusion and exclusion criteria, ensuring the appropriateness of the sample for the research question and study objectives.

Based on the researcher's data, there were a total of 791 listed companies in Malaysia in the year 2023. The researcher utilized the sample size model proposed by Krejcie and Morgan in 1970 to ascertain the required sample size for the study. As depicted in Figure 3.2, applying the Krejcie and Morgan model led to a range of 756 to 800 for the population size, resulting in a determined sample size of 256 to 260 for the study. According to Läkens (2022) pointed out that there are no specific rules dictating a minimum sample size for a study; instead, it is contingent upon the researcher's criteria and needs. In the study, the researcher opted to utilize a sample size of 260 manufacturing sector public listed company, selected from the total of 791 public listed companies in Malaysia.

Sample Sizes – Krejcie & Morgan

Table for Determining Sample Size for a Given Population									
N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

Figure 3.2: The sample sizes – Krejcie and Morgan, 1970.

3.3.2 Data Collection

Data collection was the process through which the researcher obtained information from various sources using several methods. In quantitative research, surveys emerged as one of the most effective approaches for researchers to acquire comprehensive data and information. As commonly understood, the gathered information could be categorized into primary and secondary data within the research context. Primary data referred to the data collected directly through authorized research analysis and often referred to as raw data. In contrast, secondary data was derived from the analysis of primary data conducted by someone else. For instance, secondary data could manifest as article reviews, journal summaries, or database system analyses.

Ensuring the accuracy and reliability of the collected data was paramount in the research. To secure precise and trustworthy data collection, the researcher needed to establish and scrutinize the research questions and objectives before retrieving data from the database system. It was imperative for the research questions and objectives to remain clear and unambiguous, preventing any potential misunderstanding on the researcher's part. As an illustration, in this study, data collection was conducted from Bursa Malaysia to uncover the relationship between inventory turnover and gross margin return on inventory investment (GMROI) within a selected sample size of 260 manufacturing sector public listed company from Bursa Malaysia, aiming to evaluate inventory performance over a span of ten years.

3.4 Quantitative Data- Framework

Quantitative data analysis was a process in which the researcher adopted the method to analyze data or information collected to select the best option in the research. The appropriate data or information was the keyword that determined research content that provided more understanding and detail in quantitative research. According to Baur (2011), quantitative data analysis needed to be planned, managed, and implemented effectively and efficiently in qualitative research. After the researcher got multiple data or pieces of information from the survey to help complete the study, to avoid misunderstanding various data or information collected, the researcher needed to establish a guidance framework to help them sequence the data or information related to the research topic. The quantitative data analysis guidance framework focused more on the research's dependent and independent variables. The dependent variable was when the researcher depended on other factors that would be measured in the study. Besides, the independent variable was when the researcher observed a variable that stood personal or alone. It was not changed by other variables that someone was trying to measure, meaning the independent variable was the cause. According to Baur (2011), the diagram process of the quantitative process research design was shown in Figure 3.3:

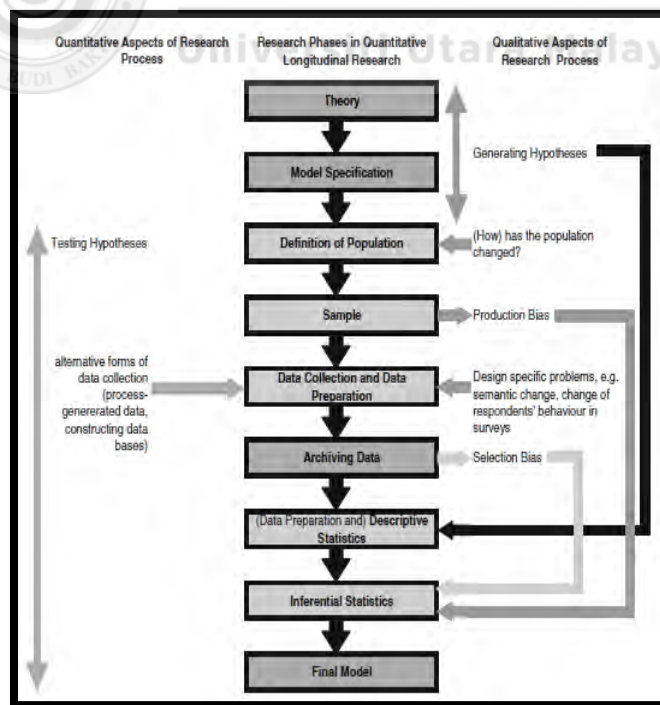


Figure 3.3: Quantitative research design framework process.

3.5 Summary

In summary, the researcher used a quantitative method to complete the study. Primarily, many researchers focused on primary data to complete studies because most of the topics were new and fresh in the research platform. However, the researcher used secondary data to complete the study because the subject could use existing data. From these points, the researcher gathered data from Bursa Malaysia, such as an annual report, to complete a quantitative study. Based on the model sample size Krejcie and Morgan (1970) mentioned, the population was around 756 to 800, which determined the sample size to be 256 to 260 as needed for the study. However, there were no specifics to decide on the minimum sample size in the study (Lakens, 2022). Meanwhile, the sample size was based on the researcher's criteria for the study. In terms of sample size, the researcher focused on 260 manufacturing sector public listed companies from Bursa Malaysia to evaluate their inventory within ten years based on inventory turnover and gross margin return on inventory investment (GMROII).



CHAPTER 4: DATA ANALYSIS AND FINDINGS

4.1 Introduction

In this chapter, the researcher delved into the analysis and findings regarding the relationship between inventory turnover and gross margin return on inventory investment (GMROII) of manufacturing sector public listed companies from Bursa Malaysia. As known, inventory management played a crucial role in the financial performance or profitability of businesses in various industries. At the same time, inventory management aimed to ensure the availability of goods, minimized holding costs, and optimized operational efficiency in the business. Most importantly, the industry needed to understand that the relationship between inventory turnover and GMROII could enhance their financial performance and profitability.

Furthermore, this chapter aimed to examine empirical evidence and statistical analysis conducted on the relationship between inventory turnover and GMROII among manufacturing sector public listed companies from Bursa Malaysia. By investigating the relationship, the researcher sought to identify the impact of inventory management practices on financial performance metrics and provided value to industries, investors, and others. Then, the researcher employed a comprehensive database that comprised financial statements, industry-specific data, and company information of manufacturing sector public listed companies from Bursa Malaysia to fulfill the research objective of the study.

Lastly, the analysis involved utilizing statistical methods and techniques to determine the nature and strength of the relationship between inventory turnover and GMROII. Also, this study highlighted the significance of the findings and the implications for the company's operation in Malaysia's dynamic business environment. By identifying the relationship between inventory turnover and GMROII, the researcher provided practical recommendations and suggestions that could be adopted by the companies to optimize their inventory management practices and enhance their financial performance.

4.2 Data Analysis

4.2.1 Sample Collection

Based on the previous Figure 3.2, the researcher applied the sample size model Krejcie and Morgan, 1970 to determine the sample size needed. The model sample size Krejcie and Morgan, 1970 mentioned that the population is around 756 to 800, which will determine the sample size is 256 to 260 as needed in the study. According to Läkens (2022), there are not any specific to decide on the minimum sample size in the study, which means the sample size is based on the criteria of the researcher needed in the study. For quantitative research, at least the sample size shall be above 100 for the researcher to analyse the data (Delİce, 2001). In this study, the researcher will use 260 companies as a sample size from 791 manufacturing sector public listed companies from Bursa Malaysia

Besides, the researcher has applied longitudinal studies examining change over time. In longitudinal studies, it can help the researcher repeatedly examine the same individuals or objects to detect any change that might occur in a period. A reason that researchers create ten years database will allow them to conduct more robust longitudinal analysis by capturing a more extended period. At the same time, it can help a researcher to identify trends, patterns, or relationships that might not be evident within a shorter timeframe. Still, it will provide a more comprehensive understanding of the researcher's topic. A larger sample size will require a longer database timeframe that can increase the power of statistical tests and improve the reliability of research findings (Byers-Heinlein, Bergmann & Savalei, 2022).

4.2.2 Secondary Data Instrument

The secondary data instrument played an essential role in the research, offering meaningful data collection and analysis. Typically, the secondary data instrument involved utilizing pre-existing data collected for purposes other than the current research study (Logan, 2020). For instance, the secondary data sources encompassed diverse materials, such as published works, government records, company financial statements, historical documents, online databases, and websites (Puntillo, Gulluscio, Huisinĝ & Veltri, 2021). Researchers often harnessed secondary data instruments to measure and analyze trends, patterns, or

phenomena across different periods, industries, and geographical locations. By leveraging secondary data, researchers accessed a wealth of information that might have otherwise required extensive time or resources to collect through primary data collection methods (Bolander, Chaker, Pappas & Bradbury, 2021).

Moreover, the secondary data instrument provided researchers with advantages and challenges. One of the main advantages was the efficiency and cost-effectiveness it offered. For example, secondary data instruments enabled researchers to tap into existing databases, saving time, effort, and resources (Omukuti, Megaw, Barlow, Altink & White, 2021). Additionally, the secondary data instrument facilitated the exploration of long-term trends and historical patterns, making it possible to analyze changes and developments over an extended period in the research (Haritha, 2023).

However, researchers had to be cautious when applying secondary data. Since the quality and relevance of the information could vary, the secondary data instrument required critical evaluation of the credibility and validity of the sources (Cutillo, Sharma, Foschini, Kundu, Mackintosh, Mandl, Beck, Collier, Colvis, Gersing, Gordon, Jensen, Shabestari & Southall, 2020). Factors such as data collection methods, sample size, and potential biases needed to be considered. Despite potential limitations, the secondary data instrument remained a powerful tool in the researcher's toolkit, enabling comprehensive and insightful analysis across various research domains (Inamdar, Raut, Narwane, Gardas, Narkhede & Sagnak, 2020).

4.2.3 Descriptive Statistics

According to Ogbe (2019), descriptive statistics was a branch of statistics that involved the analysis, summary, and presentation of data in an interpretable manner. It provided tools to describe the main characteristics of a dataset, such as mean, median, mode (a measure of central tendency), range, variance, and standard deviation (a measure of dispersion). Moreover, descriptive statistics research gained insights into the pattern, trends, and distribution of data, enabling the researcher to effectively understand and communicate a dataset's essential features (Rodriguez & Storer, 2020). In this study, the researcher applied descriptive statistics to measure inventory turnover and gross margin return on inventory investment (GMROII)

among the manufacturing sector public listed companies from Bursa Malaysia. For instance, the construction, consumer product & service, healthcare, industrial product & service, plantation, property, technology, and transportation & logistics had been focused on by the researcher among the manufacturing sector publicly listed companies from Bursa Malaysia. To a greater or lesser extent, the researcher focused on mean, mix, and max values for the descriptive statistics in the research.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 23	Construction	0.46	0.12	0.90	0.19	-0.02	0.52
Company 92	Construction	5.39	1.89	9.81	0.69	0.20	1.48
Company 108	Construction	3.87	0.61	15.61	1.18	0.09	4.69
Company 109	Construction	7.15	3.87	11.54	2.23	1.15	4.19
Company 141	Construction	0.39	0.25	0.61	0.25	0.04	0.59
Company 154	Construction	17.72	11.54	27.34	0.96	-0.61	2.52
Company 156	Construction	20.82	10.66	35.24	3.60	0.42	5.47
Company 169	Construction	6.46	1.33	11.18	1.95	0.57	6.22
Company 200	Construction	7.20	3.39	9.12	0.21	0.09	0.33
Company 220	Construction	0.51	0.14	1.13	0.02	0.00	0.10

Table 4.1: Construction sector.

Based on Table 4.1, the data construction sector with inventory turnover (2013 – 2022) and GMROII (2013 – 2022) was presented. The researcher focused on the mean, min, and max to observe the inventory trends from the construction sector in the preceding ten years. For example, ten public listed manufacturing sector companies had a construction sector category. The researcher discovered an interesting observation: there was a significant variation in Inventory Turnover values across the companies. For instance, company 156 consistently had high Inventory Turnover values, indicating efficient utilisation of its inventory. On the other hand, company 23 and company 141 had notably lower mean Inventory Turnover values, potentially suggesting that they might have experienced challenges in managing their inventory turnover effectively.

Regarding GMROII, company 156 also stood out with consistently higher mean values, indicating a solid return on investment in inventory. However, company 154, despite having high Inventory Turnover values, showed relatively lower mean GMROII values, suggesting potential inefficiencies in translating high turnover into profitable returns. Additionally, the

researcher provided that company 108 had a wide range between its minimum and maximum Inventory Turnover values, suggesting significant fluctuations in its inventory management practices over the years. Similarly, company 154 displayed a considerable range in GMROII values, further emphasizing its complex relationship between inventory turnover and profitability.

Company/Year	Manufacturing Sector	Mean	Min	Max	Mean	Min	Max
Company 1	Consumer Product & Services	7.30	6.09	9.57	3.14	2.26	3.86
Company 5	Consumer Product & Services	3.30	1.50	4.74	1.64	0.93	2.19
Company 9	Consumer Product & Services	7.57	6.49	9.12	2.52	1.61	4.01
Company 15	Consumer Product & Services	8.80	8.06	9.79	2.88	2.08	3.35
Company 16	Consumer Product & Services	1.19	0.94	1.51	1.17	0.67	1.69
Company 18	Consumer Product & Services	4.65	0.13	9.23	2.20	0.29	4.13
Company 26	Consumer Product & Services	12.42	7.93	22.34	9.62	6.65	14.70
Company 27	Consumer Product & Services	9.53	6.26	15.75	3.43	1.77	7.55
Company 29	Consumer Product & Services	2.70	1.38	3.89	1.56	0.96	2.40
Company 31	Consumer Product & Services	1.96	1.45	2.54	2.69	1.74	3.97
Company 37	Consumer Product & Services	38.07	15.78	50.57	2.25	0.70	3.19
Company 38	Consumer Product & Services	21.11	18.02	27.09	1.84	1.23	2.50
Company 40	Consumer Product & Services	7.17	4.06	15.90	0.61	0.40	1.06
Company 43	Consumer Product & Services	16.21	12.41	20.39	8.22	6.34	11.82
Company 45	Consumer Product & Services	7.86	3.86	10.05	1.66	0.73	2.29
Company 48	Consumer Product & Services	1.33	0.93	2.11	0.74	0.61	1.08
Company 52	Consumer Product & Services	0.51	0.14	1.13	0.02	0.00	0.10
Company 53	Consumer Product & Services	1.41	1.13	1.82	0.77	0.62	1.13
Company 54	Consumer Product & Services	3.44	0.89	6.56	0.70	0.13	1.38
Company 64	Consumer Product & Services	1.85	1.00	2.62	0.49	0.19	0.80
Company 73	Consumer Product & Services	5.30	3.49	6.60	0.97	0.57	1.51
Company 74	Consumer Product & Services	5.52	4.70	6.53	3.23	1.82	4.39
Company 82	Consumer Product & Services	2.07	1.61	2.38	0.74	0.35	1.03
Company 87	Consumer Product & Services	2.32	1.80	2.99	3.14	1.82	4.29
Company 89	Consumer Product & Services	3.69	1.86	5.58	1.07	-0.27	1.91
Company 90	Consumer Product & Services	3.41	2.44	4.50	0.71	0.36	1.13
Company 97	Consumer Product & Services	4.68	3.29	6.39	1.10	0.76	1.44
Company 99	Consumer Product & Services	2.04	0.81	3.85	1.03	0.38	2.15
Company 103	Consumer Product & Services	1.56	1.20	1.97	2.41	2.05	3.28
Company 104	Consumer Product & Services	11.38	6.19	14.54	1.48	0.60	2.07
Company 105	Consumer Product & Services	5.40	4.22	7.30	2.39	1.50	3.01
Company 106	Consumer Product & Services	4.38	0.57	15.61	0.47	-0.43	1.69
Company 107	Consumer Product & Services	13.18	6.09	20.24	1.12	0.52	1.82
Company 115	Consumer Product & Services	1.19	0.94	1.51	1.17	0.67	1.69
Company 116	Consumer Product & Services	9.48	4.59	25.81	0.89	0.22	1.95
Company 117	Consumer Product & Services	7.86	3.86	10.05	1.66	0.73	2.29

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 118	Consumer Product & Services	4.62	1.82	8.77	0.60	0.23	1.72
Company 119	Consumer Product & Services	1.72	0.19	4.26	0.90	0.14	2.33
Company 126	Consumer Product & Services	3.40	2.15	4.20	1.50	0.90	2.06
Company 128	Consumer Product & Services	2.50	1.89	2.99	0.22	0.09	0.38
Company 135	Consumer Product & Services	17.09	8.63	35.20	1.17	-8.95	8.67
Company 137	Consumer Product & Services	18.71	8.13	32.57	9.54	3.54	18.09
Company 145	Consumer Product & Services	7.86	7.39	8.25	4.28	2.69	5.71
Company 146	Consumer Product & Services	6.70	5.01	9.47	2.65	1.40	3.64
Company 149	Consumer Product & Services	13.76	0.68	25.80	2.58	0.36	5.40
Company 164	Consumer Product & Services	7.19	5.11	10.40	5.06	2.72	7.87
Company 171	Consumer Product & Services	3.37	2.73	4.14	1.54	1.27	1.98
Company 188	Consumer Product & Services	7.79	7.13	8.63	1.52	0.96	1.94
Company 191	Consumer Product & Services	5.52	3.80	6.34	2.90	2.22	3.67
Company 193	Consumer Product & Services	1.58	0.91	2.05	2.38	1.19	3.39
Company 194	Consumer Product & Services	6.35	4.27	8.06	1.54	0.76	2.46
Company 195	Consumer Product & Services	9.80	6.83	18.08	1.73	-0.05	3.77
Company 199	Consumer Product & Services	6.49	3.25	9.52	1.29	0.58	1.79
Company 202	Consumer Product & Services	1.19	0.94	1.51	1.17	0.67	1.69
Company 204	Consumer Product & Services	4.65	0.13	9.23	2.20	0.29	4.13
Company 206	Consumer Product & Services	5.49	0.04	18.78	0.59	0.02	2.13
Company 210	Consumer Product & Services	12.17	10.14	14.04	2.30	0.94	3.10
Company 214	Consumer Product & Services	8.36	6.85	10.96	1.52	0.18	4.70
Company 217	Consumer Product & Services	7.86	3.86	10.05	1.66	0.73	2.29
Company 218	Consumer Product & Services	17.09	13.00	24.20	18.46	11.48	26.20
Company 219	Consumer Product & Services	1.85	1.43	2.31	0.37	0.18	0.52
Company 232	Consumer Product & Services	24.41	16.43	36.05	4.28	2.52	5.73
Company 233	Consumer Product & Services	8.24	0.20	31.24	5.87	0.51	28.65
Company 234	Consumer Product & Services	3.88	1.73	6.82	0.53	0.14	1.33
Company 235	Consumer Product & Services	5.30	3.49	6.60	0.97	0.57	1.51
Company 238	Consumer Product & Services	2.44	1.71	3.18	1.66	0.97	2.07
Company 241	Consumer Product & Services	5.72	3.11	10.05	1.53	0.64	2.53
Company 247	Consumer Product & Services	4.27	0.31	14.13	1.16	0.12	6.31
Company 249	Consumer Product & Services	3.41	0.57	7.99	3.78	0.04	14.60
Company 255	Consumer Product & Services	0.96	0.71	1.50	0.19	0.12	0.29
Company 257	Consumer Product & Services	9.48	4.59	25.81	0.89	0.22	1.95
Company 258	Consumer Product & Services	7.86	3.86	10.05	1.66	0.73	2.29
Company 259	Consumer Product & Services	4.62	1.82	8.77	0.60	0.23	1.72

Table 4.2: Consumer Product & Service sector.

Table 4.2 presented the consumer product & service sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the consumer product & service sector in the preceding ten years. For example, seventy-three public listed manufacturing sector companies had a consumer product & service sector category. The researcher observed variations in Inventory

Turnover and GMROII across different companies and years. For instance, the company 37 had the highest Inventory Turnover in 2013, while company 128 had the lowest. Similarly, the company 137 achieved the highest GMROII in 2013, while company 135 had a negative GMROII.

Furthermore, the mean, minimum, and maximum values provided insights into the sector's overall performance. The company 26 consistently demonstrated high Inventory Turnover and GMROII values, indicating efficient inventory management and strong profitability. On the other hand, company 82 had relatively lower values for both metrics. From these points, it can be described that some companies experienced negative GMROII values, which could indicate inefficiencies in inventory management or pricing strategies. These values suggested potential areas for improvement to enhance profitability.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 6	Health Care	2.71	1.87	5.44	1.00	0.28	1.71
Company 14	Health Care	6.83	6.17	7.73	1.99	1.65	2.34
Company 42	Health Care	8.36	6.85	10.96	1.52	0.18	4.70
Company 134	Health Care	6.88	5.64	7.99	4.12	2.08	9.31
Company 179	Health Care	38.40	28.30	48.07	18.07	12.64	21.40
Company 224	Health Care	11.13	1.85	27.70	0.41	0.00	0.87

Table 4.3: Health Care sector.

Table 4.3 presented the healthcare sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the healthcare sector in the preceding ten years. For example, six public listed manufacturing sector companies had a healthcare sector category. The researcher observed significant variations among the companies in terms of both Inventory Turnover and GMROII. For instance, company 6 had an average Inventory Turnover of 2.71, ranging from a minimum of 1.87 to a maximum of 5.44, indicating that this company's inventory turnover rate had varied over the years. In contrast, its GMROII values were relatively stable, ranging from 0.28 to 1.71, suggesting consistent performance in generating gross margin from inventory investments.

Furthermore, company 179 demonstrated a notably higher average Inventory Turnover of 38.40, with a broader range from 28.30 to 48.07. It implied a much faster inventory turnover

rate, indicating efficient inventory management practices. The corresponding GMROII values for company 179 were also relatively high, ranging from 12.64 to 21.40, implying that the company effectively generated substantial gross margins from its inventory investments. Simultaneously, the researcher noted that company 224 stood out with a very low average Inventory Turnover of 11.13 but a deficient GMROII range between 0.00 and 0.87. It suggested the company may have needed help with inventory turnover and profitability from inventory investments.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 2	Industrial Product & Services	9.76	3.99	15.67	0.50	0.20	0.50
Company 3	Industrial Product & Services	1.87	0.15	6.39	0.39	0.04	0.40
Company 4	Industrial Product & Services	1.05	0.71	1.66	0.18	0.12	0.17
Company 7	Industrial Product & Services	3.89	2.89	4.79	0.90	0.56	0.87
Company 8	Industrial Product & Services	3.61	2.21	7.04	0.24	0.07	0.22
Company 10	Industrial Product & Services	5.82	5.06	6.64	1.37	0.83	1.39
Company 11	Industrial Product & Services	10.42	8.43	12.11	1.54	1.02	1.60
Company 12	Industrial Product & Services	2.05	1.40	3.20	0.20	-0.11	0.20
Company 13	Industrial Product & Services	85.83	54.70	121.27	21.13	14.17	21.82
Company 17	Industrial Product & Services	9.48	4.59	25.81	0.89	0.22	0.86
Company 19	Industrial Product & Services	9.50	6.03	13.10	3.87	2.83	3.86
Company 21	Industrial Product & Services	3.19	1.93	8.22	0.41	0.19	0.37
Company 25	Industrial Product & Services	4.84	2.95	6.45	2.10	1.08	2.03
Company 30	Industrial Product & Services	6.23	4.69	7.77	1.97	1.25	1.96
Company 32	Industrial Product & Services	4.60	1.26	8.84	1.94	0.35	1.64
Company 33	Industrial Product & Services	7.90	6.16	9.59	0.80	0.31	0.77
Company 34	Industrial Product & Services	4.94	3.52	5.77	0.70	0.48	0.71
Company 35	Industrial Product & Services	5.14	3.41	7.87	1.16	-0.08	1.09
Company 36	Industrial Product & Services	2.29	1.59	3.73	-0.16	-0.99	-0.20
Company 39	Industrial Product & Services	5.56	1.90	10.36	1.58	0.38	1.46

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROI (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 41	Industrial Product & Services	5.18	3.22	6.36	0.68	0.37	0.65
Company 44	Industrial Product & Services	10.67	7.18	17.08	3.34	1.12	3.30
Company 46	Industrial Product & Services	4.62	1.82	8.77	0.60	0.23	0.63
Company 51	Industrial Product & Services	1.85	1.43	2.31	0.37	0.18	0.38
Company 55	Industrial Product & Services	9.27	2.00	48.08	2.08	0.22	2.24
Company 56	Industrial Product & Services	11.13	1.85	27.70	0.41	0.00	0.40
Company 57	Industrial Product & Services	2.77	2.57	3.19	0.40	0.16	0.38
Company 58	Industrial Product & Services	3.18	1.62	5.28	0.84	0.25	0.80
Company 63	Industrial Product & Services	4.65	4.14	5.48	0.26	0.05	0.26
Company 68	Industrial Product & Services	17.58	5.27	24.45	5.31	2.93	5.19
Company 69	Industrial Product & Services	17.35	8.44	44.51	5.68	0.31	5.56
Company 70	Industrial Product & Services	24.41	16.43	36.05	4.28	2.52	4.45
Company 71	Industrial Product & Services	8.24	0.20	31.24	5.87	0.51	6.07
Company 77	Industrial Product & Services	6.51	2.82	11.79	0.31	0.10	0.30
Company 78	Industrial Product & Services	2.44	1.71	3.18	1.66	0.97	1.73
Company 79	Industrial Product & Services	0.98	0.38	2.96	0.26	-0.01	0.21
Company 83	Industrial Product & Services	2.91	1.96	4.46	0.49	0.25	0.46
Company 85	Industrial Product & Services	1.22	0.97	1.55	0.33	0.17	0.34
Company 86	Industrial Product & Services	9.25	6.94	12.32	1.22	0.49	1.10
Company 91	Industrial Product & Services	3.55	3.18	4.01	0.88	0.48	0.91

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROI (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 94	Industrial Product & Services	3.29	0.73	4.92	1.62	0.34	1.74
Company 96	Industrial Product & Services	2.69	2.21	3.28	0.96	0.69	0.97
Company 100	Industrial Product & Services	4.20	3.10	5.52	7.15	4.69	7.14
Company 101	Industrial Product & Services	3.52	2.75	5.20	2.40	1.39	2.43
Company 102	Industrial Product & Services	4.34	2.32	5.74	1.23	-0.15	1.18
Company 111	Industrial Product & Services	0.73	0.61	0.96	0.31	0.23	0.31
Company 113	Industrial Product & Services	1.82	0.16	6.47	0.46	0.04	0.48
Company 114	Industrial Product & Services	0.96	0.71	1.50	0.19	0.12	0.18
Company 120	Industrial Product & Services	4.84	2.95	6.45	2.10	1.08	2.03
Company 122	Industrial Product & Services	5.06	4.05	6.30	1.31	0.94	1.32
Company 125	Industrial Product & Services	6.16	3.67	7.48	1.91	0.66	2.03
Company 129	Industrial Product & Services	4.02	2.01	7.26	0.54	0.08	0.47
Company 131	Industrial Product & Services	3.53	2.23	5.37	1.23	0.84	1.22
Company 133	Industrial Product & Services	6.83	4.17	10.15	3.84	2.07	3.87
Company 138	Industrial Product & Services	4.96	3.22	6.26	0.87	0.19	0.87
Company 139	Industrial Product & Services	3.56	2.53	4.85	0.95	0.45	0.95
Company 140	Industrial Product & Services	2.51	0.52	7.31	0.79	0.16	0.74
Company 144	Industrial Product & Services	5.54	3.80	6.56	1.57	0.38	1.62
Company 150	Industrial Product & Services	3.31	2.58	4.46	0.91	0.64	0.94
Company 155	Industrial Product & Services	1.31	0.34	3.70	1.89	0.06	1.51

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROI (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 157	Industrial Product & Services	1.75	0.63	2.50	0.61	0.40	0.60
Company 162	Industrial Product & Services	3.88	2.82	5.22	0.41	-0.10	0.41
Company 163	Industrial Product & Services	1.89	1.55	2.25	0.41	0.32	0.41
Company 165	Industrial Product & Services	6.85	5.77	8.36	1.78	1.11	1.78
Company 166	Industrial Product & Services	8.46	7.26	10.27	2.10	1.70	2.12
Company 167	Industrial Product & Services	7.48	4.61	13.34	3.81	2.26	3.94
Company 172	Industrial Product & Services	2.43	1.92	2.94	0.49	0.06	0.43
Company 173	Industrial Product & Services	2.00	1.70	2.27	0.73	0.53	0.74
Company 175	Industrial Product & Services	4.66	2.41	7.90	0.42	0.19	0.43
Company 176	Industrial Product & Services	5.74	2.33	10.08	1.21	0.14	1.20
Company 177	Industrial Product & Services	6.05	3.37	7.61	2.24	1.66	2.29
Company 178	Industrial Product & Services	6.47	1.96	10.55	1.14	-0.03	1.09
Company 180	Industrial Product & Services	8.95	6.90	14.86	0.48	0.31	0.47
Company 183	Industrial Product & Services	3.37	2.57	4.26	2.26	1.68	2.28
Company 184	Industrial Product & Services	3.93	3.36	4.60	2.43	1.43	2.53
Company 185	Industrial Product & Services	6.48	3.20	15.10	1.18	0.53	1.08
Company 186	Industrial Product & Services	4.11	3.36	5.62	0.60	0.33	0.55
Company 189	Industrial Product & Services	4.42	1.93	6.51	0.69	0.43	0.65
Company 192	Industrial Product & Services	2.32	1.99	3.18	0.40	0.23	0.38
Company 196	Industrial Product & Services	7.86	4.73	9.90	1.32	0.64	1.25

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROI (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 197	Industrial Product & Services	1.59	1.09	2.35	0.78	0.30	0.77
Company 201	Industrial Product & Services	8.80	8.06	9.79	2.88	2.08	2.84
Company 209	Industrial Product & Services	9.53	6.26	15.75	3.43	1.77	3.01
Company 212	Industrial Product & Services	7.17	4.06	15.90	0.61	0.40	0.63
Company 221	Industrial Product & Services	1.41	1.13	1.82	0.77	0.62	0.78
Company 222	Industrial Product & Services	3.44	0.89	6.56	0.70	0.13	0.72
Company 223	Industrial Product & Services	9.27	2.00	48.08	2.08	0.22	2.24
Company 230	Industrial Product & Services	84.87	54.42	124.67	17.99	0.22	45.15
Company 231	Industrial Product & Services	17.35	8.44	44.51	5.68	0.31	9.49
Company 236	Industrial Product & Services	3.09	0.70	9.35	6.27	0.14	24.42
Company 237	Industrial Product & Services	6.51	2.82	11.79	0.31	0.10	0.49
Company 239	Industrial Product & Services	0.98	0.38	2.96	0.26	-0.01	0.97
Company 240	Industrial Product & Services	6.11	3.57	9.29	6.00	-0.01	10.08
Company 245	Industrial Product & Services	3.55	3.18	4.01	0.88	0.48	1.33
Company 248	Industrial Product & Services	3.29	0.73	4.92	1.62	0.34	2.85
Company 250	Industrial Product & Services	5.40	4.22	7.30	2.39	0.34	3.01
Company 252	Industrial Product & Services	13.18	6.09	20.24	1.12	0.52	1.82
Company 253	Industrial Product & Services	3.87	0.61	15.61	1.18	0.09	4.69
Company 254	Industrial Product & Services	7.15	3.87	11.54	2.23	0.09	4.19
Company 256	Industrial Product & Services	1.19	0.94	1.51	1.17	0.67	1.69

Table 4.4: Industrial Product & Service sector.

Table 4.4 presented the industrial product and service sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the industrial product and service sector in the preceding ten years. For example, a hundred public listed manufacturing sector companies had an industrial product and service sector category. Upon analyzing the data, the researcher focused on several key insights that emerged. Notably, there was a wide range of values for Inventory Turnover and GMROII among the different companies. For instance, company 13 demonstrated an exceptionally high average Inventory Turnover of 85.83, indicating that its inventory was sold and replenished rapidly. In comparison, company 79 showed a low average Inventory Turnover of 0.98, suggesting a slower inventory turnover rate.

Regarding GMROII, company 100 stood out with a high average value of 7.15, indicating that it efficiently generated gross margin returns from its inventory investments. However, company 56 exhibited a relatively low GMROII, ranging from 0.00 to 0.40, suggesting challenges in developing gross margin returns from its inventory. Concerning consistency, some companies showed relatively stable metrics over the years. For instance, company 176 maintained a consistent Inventory Turnover and GMROII range, indicating steady inventory management practices. On the other hand, company 230 displayed significant variability in both metrics, suggesting fluctuating performance over time. The data also highlighted instances of negative GMROII values, such as company 36. Negative GMROII could indicate that a company did not effectively generate gross margin returns from its inventory investments, which could be a concerning sign.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 47	Plantation	10.44	7.69	17.30	2.00	0.59	4.63
Company 50	Plantation	17.09	13.00	24.20	18.46	11.48	26.20
Company 67	Plantation	88.80	67.74	141.79	50.46	11.01	100.79
Company 98	Plantation	8.30	5.77	10.87	1.05	0.65	1.72
Company 132	Plantation	4.94	3.75	6.76	3.42	1.45	5.39
Company 152	Plantation	3.36	0.57	8.85	2.81	0.18	5.41
Company 153	Plantation	10.42	2.38	19.97	5.70	0.58	11.66
Company 158	Plantation	6.96	4.98	12.62	1.89	-0.71	6.47
Company 174	Plantation	16.09	11.81	20.84	4.43	2.41	9.92
Company 181	Plantation	3.83	2.54	4.37	0.68	-0.08	1.20
Company 182	Plantation	7.31	6.29	9.90	1.30	0.76	1.71
Company 226	Plantation	3.18	1.62	5.28	0.84	0.25	1.52
Company 229	Plantation	2.83	1.92	3.65	0.86	0.57	1.06
Company 260	Plantation	1.72	0.19	4.26	0.90	0.14	2.33

Table 4.5: Plantation sector.

Table 4.5 presented the plantation sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the plantation sector in the preceding ten years. For example, fourteen public listed manufacturing sector companies had a plantation sector category. The researcher observed that company 67 had the highest average Inventory Turnover of 88.80, indicating a rapid inventory turnover rate within the Plantation sector. It suggested that the company efficiently managed its inventory by quickly selling and replenishing products. Correspondingly, its GMROII averaged at 50.46, indicating a solid ability to generate gross margin returns from its inventory investments.

However, company 260 exhibited the lowest average Inventory Turnover of 1.72, suggesting a slower inventory turnover rate. It could indicate different business practices or challenges within the company's operations. Its GMROII, however, stood relatively high at 0.90, despite the low inventory turnover rate, indicating effective margin generation from the inventory it held. Furthermore, company 152 and company 181 showcased exciting dynamics. While company 152 had a relatively low average Inventory Turnover of 3.36, its GMROII was notably higher at 2.81. It implied that the company effectively capitalized on its inventory investments to generate gross margin returns. In contrast, company 181 demonstrated a

moderate Inventory Turnover of 3.83 but a relatively low GMROII of 0.68, suggesting potential areas for improvement in generating gross margin returns.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 20	Property	5.49	0.04	18.78	0.59	0.02	2.13
Company 22	Property	1.72	0.19	4.26	0.90	0.14	2.33
Company 24	Property	0.72	0.32	1.10	0.90	0.58	1.07
Company 59	Property	0.39	0.04	1.20	0.66	0.13	1.58
Company 60	Property	2.25	0.18	15.04	2.09	0.08	13.59
Company 61	Property	1.70	0.78	2.72	0.82	0.42	1.46
Company 62	Property	2.60	0.99	6.79	2.91	0.22	9.40
Company 72	Property	3.88	1.73	6.82	0.53	0.14	1.33
Company 75	Property	1.36	0.14	4.41	1.15	0.18	3.78
Company 76	Property	3.09	0.70	9.35	6.27	0.14	24.42
Company 81	Property	2.33	0.37	13.01	2.48	0.87	10.07
Company 84	Property	5.72	3.11	10.05	1.53	0.64	2.53
Company 88	Property	5.40	1.48	10.93	1.61	0.70	2.97
Company 93	Property	4.27	0.31	14.13	1.16	0.12	6.31
Company 95	Property	3.41	0.57	7.99	3.78	0.04	14.60
Company 112	Property	8.73	3.65	12.01	0.68	0.21	1.06
Company 121	Property	7.54	1.30	18.78	2.55	0.25	8.65
Company 124	Property	2.50	0.65	5.30	1.23	0.41	2.36
Company 127	Property	2.76	0.36	13.84	2.04	0.36	8.27
Company 130	Property	0.31	0.18	0.45	0.17	0.07	0.29
Company 136	Property	0.46	0.03	2.24	0.44	0.09	1.51
Company 142	Property	2.53	0.60	6.12	8.81	0.10	26.36
Company 147	Property	1.50	0.06	4.28	0.82	0.03	2.08
Company 148	Property	0.73	0.29	1.32	0.32	0.16	0.59
Company 168	Property	0.41	0.09	0.81	0.56	0.08	1.04
Company 170	Property	5.25	0.37	16.38	1.49	0.05	4.96
Company 187	Property	1.78	0.65	2.64	1.12	0.11	3.20
Company 190	Property	1.04	0.09	3.11	1.10	0.28	2.27
Company 198	Property	0.43	0.11	2.05	0.18	0.01	0.62
Company 203	Property	9.48	4.59	25.81	0.89	0.22	1.95
Company 205	Property	9.50	6.03	13.10	3.87	2.83	5.10
Company 207	Property	4.84	2.95	6.45	2.10	1.08	2.83
Company 208	Property	12.42	7.93	22.34	9.62	6.65	14.70
Company 213	Property	5.18	3.22	6.36	0.68	0.37	0.98
Company 227	Property	4.65	4.14	5.48	0.26	0.05	0.46
Company 228	Property	1.85	1.00	2.62	0.49	0.19	0.80
Company 242	Property	1.22	0.97	1.55	0.33	0.17	0.55
Company 244	Property	2.32	1.80	2.99	3.14	1.82	4.29
Company 251	Property	4.38	0.57	15.61	0.47	-0.43	1.69

Table 4.6: Property sector.

Table 4.6 presented the property sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the property sector in the preceding ten years. For instance, thirty-nine public listed manufacturing sector companies had a property sector category. The researcher discovered that company 207 demonstrated a consistent average Inventory Turnover of 4.84, indicating a moderate inventory turnover rate within the Property sector. Correspondingly, its GMROII averaged at 2.10, suggesting adequate gross margin returns from inventory investments.

Furthermore, company 142 showcased a relatively high average GMROII of 8.81 despite its Inventory Turnover of 2.53, indicating the company's efficient ability to generate substantial gross margin returns from its inventory investments. Conversely, Company 130 had a notably low average Inventory Turnover of 0.31 and a corresponding low GMROII of 0.17, suggesting potential areas for improvement in inventory management and margin generation. These points highlighted the wide range of values within the Property sector. However, company 205 maintained a consistent average Inventory Turnover of 9.50, but its GMROII ranged from 2.83 to 5.10. This indicated fluctuations in the company's ability to generate gross margin returns despite consistent inventory turnover.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 28	Technology	12.17	10.14	14.04	2.30	0.94	3.10
Company 65	Technology	2.83	1.92	3.65	0.86	0.57	1.06
Company 66	Technology	84.87	54.42	124.67	17.99	1.17	45.15
Company 80	Technology	6.11	3.57	9.29	6.00	2.04	10.08
Company 110	Technology	2.84	2.01	3.55	2.25	1.30	5.42
Company 123	Technology	15.56	11.66	21.32	7.68	4.38	11.83
Company 151	Technology	5.29	2.68	7.08	1.76	1.02	3.09
Company 159	Technology	5.17	3.10	6.28	0.12	-0.15	0.58
Company 160	Technology	3.03	2.33	3.96	8.96	6.22	12.34
Company 161	Technology	6.64	3.60	8.73	1.48	0.38	2.58
Company 215	Technology	16.21	12.41	20.39	8.22	6.34	11.82

Table 4.7: Technology sector.

Table 4.7 presented the technology sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the technology sector in the preceding ten years. For instance, eleven

public listed manufacturing sector companies had a technology sector category. The researcher observed that company 66 stood out with the highest average Inventory Turnover of 84.87, indicating a rapid inventory turnover rate within the Technology sector. It suggested that the company efficiently managed its inventory by quickly selling and replenishing products. Correspondingly, its GMROII averaged 17.99, indicating a solid ability to generate gross margin returns from its inventory investments.

Furthermore, company 160 demonstrated a high average GMROII of 8.96, which was reliable for generating substantial gross margin returns from inventory investments. Its Inventory Turnover was relatively moderate, ranging from 2.33 to 3.96, implying efficient inventory utilisation for profit generation. On the other hand, company 159 had a notably low average GMROII of 0.12, which, coupled with its negative minimum value of -0.15, suggested potential challenges or inefficiencies in generating gross margin returns from inventory investments. Despite a reasonable average Inventory Turnover of 5.17, this company may have needed to address margin optimization strategies. In comparison, company 80 showcased a scenario where both Inventory Turnover and GMROII had matching values, suggesting a balance between efficient inventory turnover and effective gross margin return generation.

Company/Year	Manufacturing Sector	Inventory Turnover (2013 - 2022)			GMROII (2013 - 2022)		
		Mean	Min	Max	Mean	Min	Max
Company 49	Transportation & Logistics	2.42	1.97	3.28	0.28	0.07	0.48
Company 143	Transportation & Logistics	13.24	6.98	18.71	1.59	0.33	2.99
Company 211	Transportation & Logistics	2.70	1.38	3.89	1.56	0.96	2.40
Company 216	Transportation & Logistics	10.67	7.18	17.08	3.34	1.12	4.89

Table 4.8: Transportation and Logistics sector.

Table 4.8 presented the transportation and logistics sector data with inventory turnover (2013 – 2022) and GMROII (2013 – 2022). The researcher focused on the mean, min, and max to observe the inventory trends from the transportation and logistics sector in the preceding ten years. For instance, four publicly listed manufacturing sector companies had a technology sector category. The researcher pointed out that company 143 had a high average Inventory Turnover of 13.24, suggesting a rapid inventory turnover rate within the Transportation & Logistics sector. This implied efficient management of inventory levels, potentially due to a streamlined supply chain and effective demand forecasting. Correspondingly, its GMROII

averaged at 1.59, indicating that the company successfully generated gross margin returns from its inventory investments.

On the other hand, company 49 had a comparatively lower average Inventory Turnover of 2.42, indicating a slower pace of inventory turnover. This might have been due to the nature of the Transportation & Logistics sector, which could have involved longer lead times or storage requirements. The associated GMROII average of 0.28 suggested a lower ability to generate gross margin returns from inventory investments, potentially indicating areas for improvement in cost control or pricing strategies. Additionally, the researcher discovered that company 211 fell within a moderate range of Inventory Turnover with an average of 2.70. In contrast, its GMROII average of 1.56 suggested an intermediate ability to generate gross margin returns from inventory investments.



4.3 Data Findings

In this study, the researcher looked at how quickly public listed companies in Malaysia's manufacturing sector sold their inventory and how that affected the organisation's profit. From these points, the researcher could understand how managing inventory well could lead to better financial outcomes for public listed companies in Malaysia's manufacturing sector. For instance, it could help companies understand how intelligent inventory management could make the business more successful. To fulfill the goals, the researcher focused on two research objectives and achieved them in the research.

4.3.1 To identify the trends of inventory turnover and gross margin return on inventory investment (GMROII) among manufacturing sector public listed companies in Malaysia. (RO1)

To fulfill RO1, the researcher applied a histogram chart to identify the trends of inventory turnover and gross margin return on inventory investment (GMROII) among manufacturing sector publicly listed companies in Malaysia. The mean was a crucial function that helped the researcher identify the trends of inventory turnover and GMROII among manufacturing sector public listed companies in Malaysia in the last ten years (2013 – 2022). For instance, the study conducted an analysis of construction, consumer product & service, healthcare, industrial product & service, plantation, property, technology, and transportation & logistics sectors.

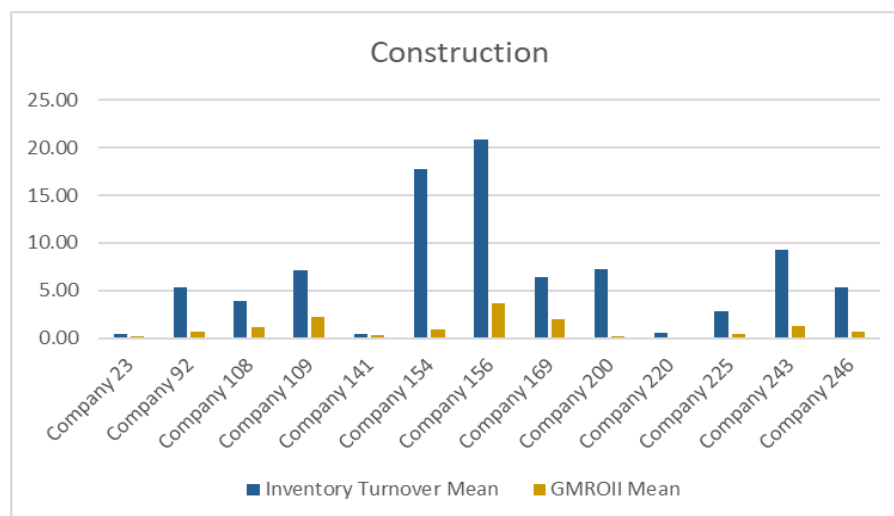


Figure 4.1: Construction sector.

Figure 4.1 illustrated the performance of various construction companies in terms of inventory turnover and GMROII over the years from 2013 to 2022. Inventory turnover, indicating how frequently inventory was sold and replaced, varied among the companies. Companies 154 and 156 notably stood out with consistently high turnover rates, implying efficient inventory management. In contrast, companies 23 and 220 exhibited lower turnover rates, suggesting room for improvement in their inventory practices.

Furthermore, a similar pattern emerged when the researcher paid attention to GMROII, which reflected profitability per dollar invested in inventory. Companies 154 and 156 consistently achieved remarkable GMROII values, indicating strong profitability from their inventory investments. In comparison, companies 23 and 220 displayed lower GMROII values, showing opportunities for enhancing profitability through better inventory strategies. In summary, the graph provided insights into these construction companies' diverse inventory management and profitability performances. It emphasized balancing inventory turnover and GMROII for optimal operational efficiency and financial success.

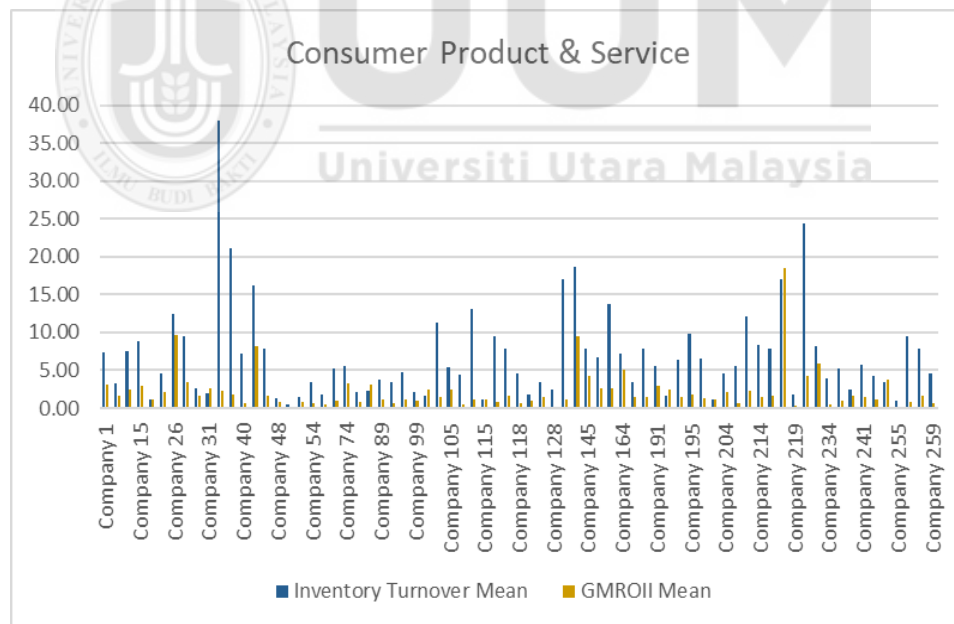


Figure 4.2: Consumer Product & Service sector.

Figure 4.2 depicted the changes in Inventory Turnover and Gross margin return on inventory investment (GMROII) for various companies within the Consumer Product & Services sector from 2013 to 2022. Notably, company 37 had demonstrated remarkable

inventory turnover in 2013, boasting a notably high value of 38.07, whereas company 52 had exhibited the lowest turnover of 0.51 in the same year. It indicated that company 37 had efficiently sold and replenished its products frequently, in contrast to the slower inventory movement of company 52. Turning attention to GMROII, company 146 had achieved an exceptional GMROII of 18.46 in 2013, indicating substantial profits from its inventory. Conversely, company 52 had recorded the lowest GMROII of 0.02 in the same year, signifying comparatively lower profitability from its stock. Examining these trends over the specified timeframe had provided insights into how companies managed inventory and generated profits. Consistently high inventory turnover and GMROII values had suggested effective inventory management and significant profitability, while lower figures may have indicated areas for improvement in inventory strategies and profitability.

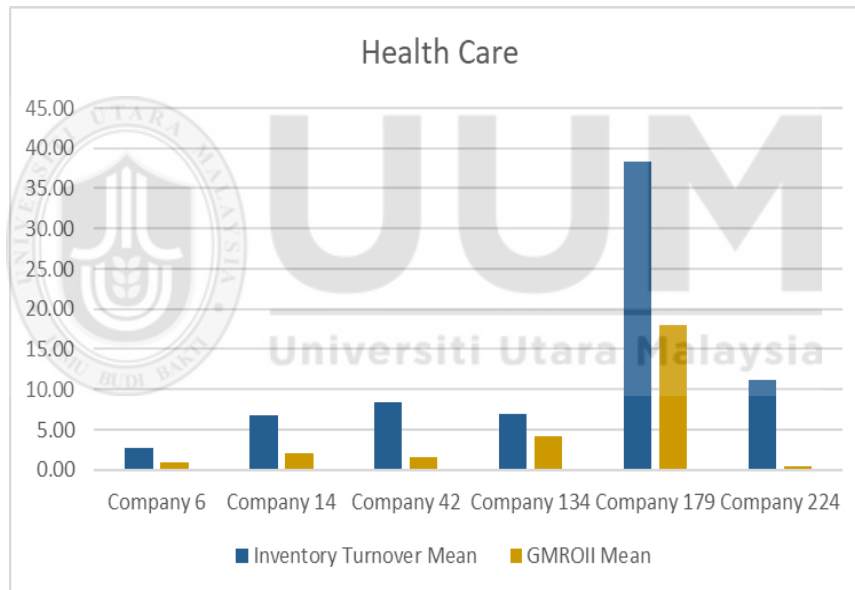


Figure 4.3: Health Care sector.

Figure 4.3 illustrated the performance of various companies in the Health Care sector from 2013 to 2022 regarding inventory turnover and gross margin return on inventory investment (GMROII). Inventory turnover represented how efficiently companies had sold their inventory, with higher values indicating quicker turnover. GMROII reflected the profitability of stock, where higher values had indicated better profits relative to the investment in inventory.

Regarding inventory turnover, there had been a range of values across the companies. Company 179 had stood out with the highest turnover, indicating rapid inventory sales. Then, companies 42, 134, and 224 had shown relatively higher turnover rates. On the other hand, company 6 had a lower turnover rate, suggesting a slower pace of inventory sales. When considering GMROII, a similar pattern had been observed. Company 179 had led with the highest GMROII, signifying strong profitability from inventory. Companies 134 and 42 had also performed well in generating profits from stock. In contrast, company 224 had shown a lower GMROII, suggesting room for improvement in converting inventory into profits.

Overall, the graph had emphasized the importance of effective inventory management for profitability. Each company's position on the chart had revealed its unique approach to inventory turnover and GMROII, underlining the diverse strategies employed within the Health Care sector.

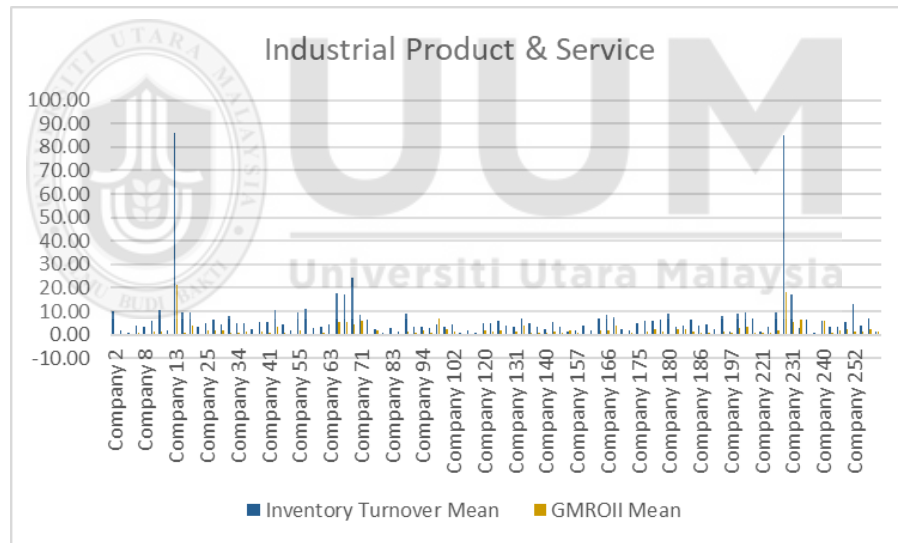


Figure 4.4: Industrial Product & Service sector.

Figure 4.4 illustrated the trends in Inventory Turnover and Gross margin return on inventory investment (GMROII) industrial product & service sector companies revealed valuable insights. Inventory turnover, which indicated how swiftly a company sold and replenished its inventory, showcased diverse performances. For instance, companies like company 100 and company 230 exhibited rapid turnover, reflecting efficient inventory management, while others like company 4 and company 131 displayed slower turnover rates, suggesting potential areas for improvement.

Conversely, the GMROII was measure of how effectively inventory translated into profits, highlighted distinct patterns. For instance, the company 100 and company 150 excelled in converting inventory investments into substantial gains, underscoring operational solid performance. In contrast, company 39 and company 163 achieved lower GMROII values, indicating a need to enhance strategies for maximizing profitability from inventory. These trends underscored the variation in inventory management efficiency and profit generation strategies across different manufacturing sector companies. It's important to note that these observations derived from the provided data and that industry dynamics and specific operational contexts could influence individual company performance.

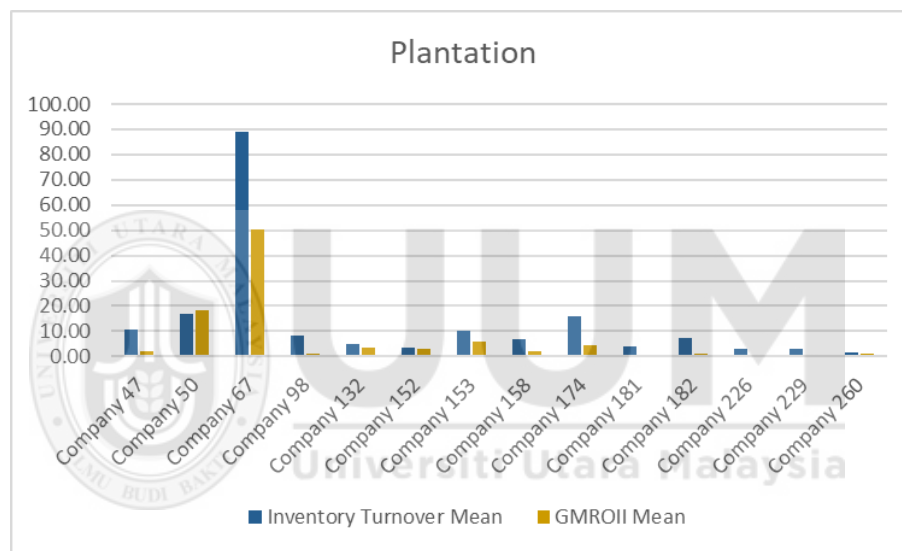


Figure 4.5: Plantation sector.

Figure 4.5 illustrated the inventory turnover and gross margin return on inventory investment (GMROII) for the plantation sector from 2013 to 2022. Company 67 had the highest inventory turnover of 88.80, indicating exceptional inventory management efficiency. This efficiency was further reflected in its GMROII of 50.46, highlighting a substantial return on its inventory investment. Company 50 also demonstrated strong performance, boasting an inventory turnover of 17.09 and a GMROII of 18.46. However, no consistent linear trend was evident across the dataset, suggesting that inventory turnover and GMROII varied significantly between companies. The graph underscored the need for individualized strategies tailored to each company's inventory management and profitability goals rather than a uniform approach

across the entire sector. These observations were based on the data provided and might have revealed more meaningful insights with additional years of data or industry context.

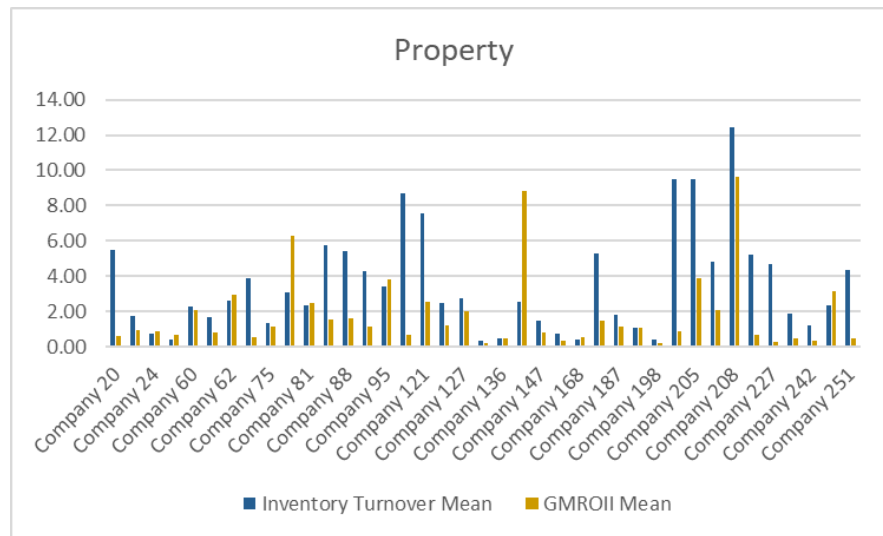


Figure 4.6: Property sector.

Figure 4.6 provided data that revealed exciting trends in inventory turnover and gross margin return on inventory investment (GMROII) among companies in the property sector from 2013 to 2022. The graph showed that company 208 consistently had the highest inventory turnover and GMROII values. Its inventory turnover and GMROII had experienced a remarkable surge over the years, highlighting efficient inventory management and robust profitability.

Moreover, company 130 exhibited consistently low inventory turnover and GMROII values, implying potential challenges in swiftly selling inventory and generating substantial profits. Then, company 142 demonstrated a noteworthy rise in GMROII, indicating improved inventory profitability despite relatively moderate inventory turnover. Different companies followed diverse trajectories. While some maintained stable inventory turnover and GMROII levels, like company 205 and company 207, others experienced fluctuations. Overall, these trends shed light on the varying inventory management strategies and profitability outcomes within the property sector during the analyzed period.

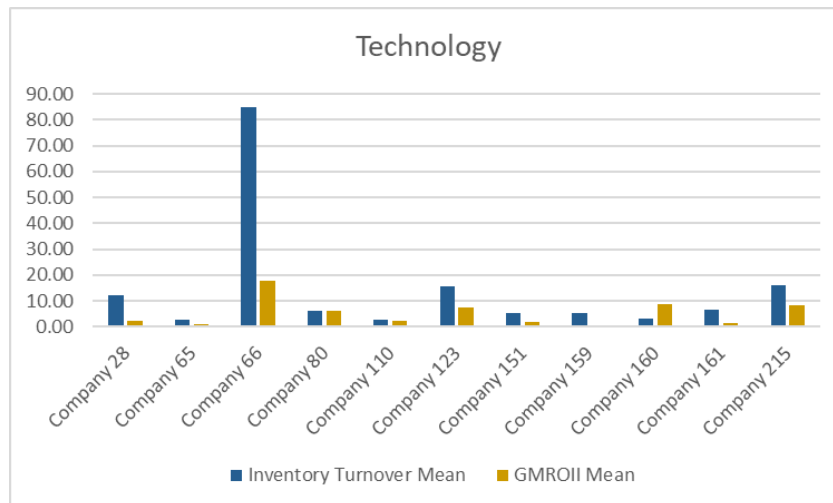


Figure 4.7: Technology sector.

Figure 4.7 illustrated the inventory turnover and gross margin return on inventory investment (GMROII) trends for various companies in the technology sector from 2013 to 2022. Inventory turnover varied widely across companies, representing how often inventory was sold and replaced. Company 66 had an exceptionally high turnover rate, suggesting efficient inventory management and rapid sales. Conversely, company 65 had a lower turnover rate, indicating potential inventory management challenges.

The GMROII indicating profitability from inventory also varied considerably. Company 66 again led with a significantly high GMROII, implying strong profitability relative to inventory investment. Another standout was company 160, which exhibited good profitability as well. However, company 159 had the lowest GMROII, suggesting room for improvement in generating returns from inventory.

Lastly, these trends emphasized the importance of efficient inventory management and highlighted successful strategies and areas for enhancement within the technology sector. Further exploration of outlier performances and industry benchmarking could provide valuable insights for optimizing inventory practices and profitability strategies.

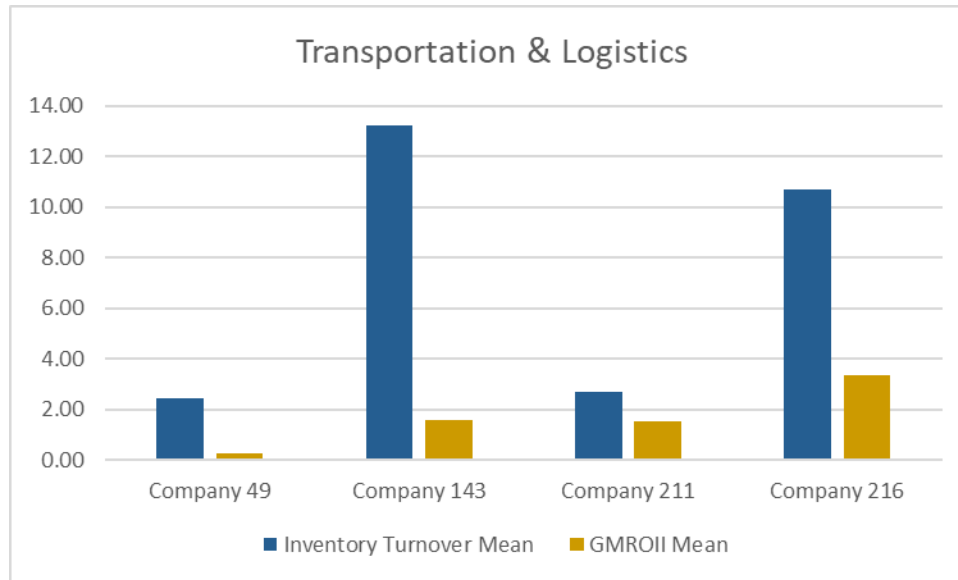


Figure 4.8: Transportation & Logistics sector.

Figure 4.8 illustrated varying patterns when looking at Inventory Turnover, which measured how quickly a company sold and replaced its inventory in the transportation & logistics sector. Company 143 consistently stood out with a remarkably high average turnover of 13.24, indicating efficient inventory management and strong demand for its products. On the other hand, company 49 and company 211 maintained relatively lower and stable turnover rates, around 2.42 and 2.70, respectively, suggesting they needed to sell through their inventory more slowly. Then, company 216 exhibited an intermediate turnover rate of approximately 10.67, showcasing its ability to move inventory relatively briskly.

Similar trends were observed when the researcher focused on Gross margin return on inventory investment (GMROII), which showed how effectively a company generated profit from its inventory. Company 143 and Company 211 had demonstrated consistently higher GMROII values, around 1.59 and 1.56, respectively, indicating their proficiency in developing better profits relative to their inventory investments. Then, company 216 had excelled in this regard, with the highest average GMROII of about 3.34, showcasing impressive profitability from its inventory. However, company 49 had lagged with a lower GMROII of around 0.28, suggesting potential room for improvement in generating profits from its inventory.

4.3.2 To investigate the manufacturing sector public listed companies in Malaysia improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII. (RO2)

To fulfill RO2, the researcher applied an Analyzing Inventory Efficiency: Quadrant Inventory Turnover and GMROII to investigate the manufacturing sector public-listed companies in Malaysia to improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII. From these points, the researcher used the mean to investigate the manufacturing sector public-listed companies in Malaysia to improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII in the last ten years (2013 – 2022). For instance, the study analyzed construction, consumer product & service, healthcare, industrial product & service, plantation, property, technology, and transportation & logistics sectors.

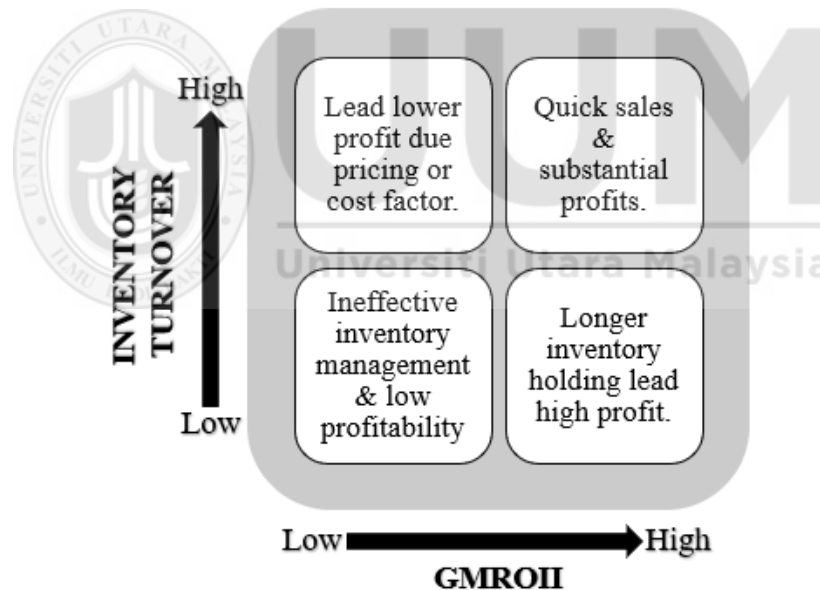


Figure 4.9: Analyzing Inventory Efficiency: Quadrant Inventory Turnover and GMROII
(Liang, 2011)

Based on Figure 4.9, the Analyzing Inventory Efficiency: Quadrant Inventory Turnover and GMROII were shown. It aimed to shed light on the intricate landscape of product efficiency. By closely examining the relationship between Quadrant Inventory Turnover and Gross margin return on inventory investment (GMROII), the researcher sought to uncover valuable insights

into the operational dynamics of companies within the sector. Through a comprehensive analysis of these metrics, the study endeavoured to understand better how various products were managed, their contribution to sales, or the overall impact on profitability. In the study, the researcher aimed to offer a comprehensive framework for enhancing inventory management strategies and optimizing resource allocation in Malaysia's manufacturing landscape after focusing on this dual perspective of inventory turnover and gross margin return.

Manufacturing Sector	Inventory Turnover (2013 - 2022)	GMROII (2013 - 2022)	Status
Construction	6.72	1.05	High IV, Low GMROII
Consumer Product & Service	6.92	2.25	High IV, High GMROII
Health Care	12.39	4.52	High IV, High GMROII
Industrial Product & Service	7.06	1.92	High IV, High GMROII
Plantation	13.23	6.77	High IV, High GMROII
Property	3.49	1.81	Low IV, Low GMROII
Technology	14.61	5.24	High IV, High GMROII
Transportation & Logistics	7.26	1.69	High IV, Low GMROII

Table 4.9: Inventory Efficiency and Profitability Trends in Manufacturing Sectors (2013 – 2022).

Usually, the researcher referred to historical data, financial reports, or other relevant information to investigate the manufacturing sector public-listed companies in Malaysia to improve inventory planning and resource allocation for different products by leveraging inventory turnover and GMROII. For instance, the researcher's analysis used Table 4.9, provided, showcasing data on Inventory Turnover and GMROII (Gross margin return on inventory investment) across different sectors in the manufacturing industry from 2013 to 2022. From these points, the researcher had applied and linked concepts together with the Quadrant Inventory Turnover and GMROII analysis, involving categorizing sectors into four quadrants based on their Inventory Turnover and GMROII values.

In the top-right quadrant were sectors with high Inventory Turnover and GMROII, signifying efficient inventory management and strong profitability. Besides, the sectors with high Inventory Turnover but low GMROII resided in the top-left quadrant, suggesting efficient sales but potentially low profitability due to pricing or cost issues. Then, the sectors with low Inventory Turnover but high GMROII were in the bottom-right quadrant, implying more extended inventory retention periods yet yielding high profitability. Lastly, the sectors with

low values for both metrics fell into the bottom-left quadrant, indicating suboptimal inventory management and profitability.

The researcher applied the combination between Figure 4.9 and Table 4.9 and discovered that the construction sector demonstrated high Inventory Turnover but low GMROII, indicating efficient sales but lower profitability. Then, the sectors like consumer product & service, health care, industrial product & service, plantation, and technology were in the top-right quadrant, showcasing effective inventory management and strong profitability. The property sector exhibited low values in both metrics, indicating inventory turnover and profitability challenges. Similarly, the transportation & logistics sector displayed high Inventory Turnover but low GMROII, suggesting efficient sales but less profitability. This analysis aided in identifying sectors excelling in inventory management and profit generation, those needing profitability enhancement, and areas requiring overall improvement in both aspects.



CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Discussion

In Malaysia's business world, the explanation of how well a manufacturing company managed its inventory and generated profits resembled a delicate dance. It encompassed two crucial elements: the frequency of inventory sales (inventory turnover) and the profitability derived from it (GMROII). From these points, the researcher analyzed that inventory turnover indicated how swiftly a company sold its inventory. Rapid sales often signaled positive outcomes. Conversely, GMROII examined the profitability a company achieved relative to its investment in inventory. This analysis helped researchers observe and uncover whether companies were making prudent resource allocation decisions in the study.

Through a study of how inventory turnover and GMROII interacted within the manufacturing sector public-listed companies in Malaysia, the researcher learned about their strategies. This knowledge enabled the researcher to understand how companies balanced having sufficient inventory for sale while generating substantial profits. Simultaneously, the efficiency with which companies produced goods, anticipated demand, and managed inventory all played integral roles. During discussions, the researcher delved deeper into these concepts, explored the interconnections within companies, and examined real-world examples from publicly listed manufacturing sector companies in Malaysia. This exploration aided the researcher in gaining a better understanding of how manufacturing sector public-listed companies navigated inventory management and drove business success in Malaysia.

5.1.1 Construction Sector

The construction sector encountered challenges, often resulting in high inventory turnover and a relatively low Gross margin return on inventory investment (GMROII). Firstly, construction projects were characterized by the need for various materials and equipment, ranging from cement and steel to specialized tools. The nature of those projects, with their unique requirements and fluctuating demand for different materials, drove construction companies to maintain efficient inventory turnover. High turnover helped ensure that suitable materials were available when needed, preventing delays in project timelines and optimizing resource allocation.

Secondly, construction projects were influenced by factors such as seasonality, economic conditions, and regulatory approvals, which could lead to fluctuations in demand and unpredictable project schedules. This uncertainty could result in a lower GMROII, as it might require more work to accurately forecast and manage the timing of inventory usage, leading to potential carrying costs and underutilized assets.

Moreover, construction materials and equipment often had relatively low-profit margins due to competitive pricing and the commoditized nature of many items. This, coupled with the challenges of managing extensive inventories of bulky and heavy materials, could contribute to a lower GMROII. Additionally, the capital-intensive nature of the construction industry, with significant investments required in machinery and equipment, could limit the financial resources available for optimizing inventory management practices.

Furthermore, the construction sector was subject to project-specific specifications, which could lead to a mismatch between the inventory on hand and the unique requirements of each project. It could result in excess inventory or the need to procure specialized items on short notice, affecting inventory turnover and GMROII.

The construction sector's characteristics, including project variability, low-profit margins, and the need for diverse materials, contributed to high inventory turnover. However, the inherent challenges in accurately predicting demand and the nature of construction projects often led to a relatively low GMROII. While efficient inventory management remained crucial, external factors and industry dynamics could impact the sector's ability to achieve higher returns on its inventory investments.

5.1.2 Consumer Product & Service Sector

Consumer products and services often experienced high inventory turnover and high Gross margin return on inventory investment (GMROII) due to a combination of factors inherent to their industry dynamics. Firstly, the fast-paced nature of consumer preferences and market trends drove companies to maintain a lean and responsive inventory management strategy. Products and services in this sector were subject to rapidly changing consumer demands and short product lifecycles. As a result, businesses strived to minimize their

inventory holding periods to swiftly adapt to shifting market dynamics, preventing the accumulation of obsolete stock.

Secondly, the competition within the consumer market was fierce, leading companies to focus on optimizing their supply chain efficiency. It involved close supplier coordination, efficient logistics, and streamlined distribution networks. High inventory turnover helped to reduce holding costs, freeing up capital that could be reinvested in other aspects of the business, such as marketing, research, and innovation.

Furthermore, consumer products and services often came with higher profit margins, allowing companies to generate significant returns on their inventory investments. By closely monitoring inventory turnover and managing their product mix effectively, businesses ensured that their resources were allocated to the most profitable items, thus maximizing their GMROII.

The interplay of swiftly changing consumer preferences, intense market competition, and the potential for healthy profit margins drove the consumer product and service industry to maintain high inventory turnover and GMROII. This strategic approach ensured responsiveness to market demands and enabled companies to optimize their profitability and growth potential.

5.1.3 Health Care Sector

The healthcare sector experienced high inventory turnover and a potentially high Gross margin return on inventory investment (GMROII) due to distinct factors shaped by the industry's unique characteristics. Firstly, the critical nature of healthcare services and products demanded a focus on patient care and safety, prompting healthcare organisations to manage their inventory efficiently. Rapid technological advancements and evolving medical practices necessitated constantly updating medical supplies, pharmaceuticals, and equipment. As a result, healthcare entities strove to optimize their inventory levels to meet patient needs promptly, minimizing the risk of wastage or obsolescence.

Secondly, healthcare operated in a regulated environment with stringent quality and safety standards. It required precise inventory tracking to ensure the availability of necessary items while complying with regulatory requirements. Efficient inventory turnover allowed

healthcare providers to maintain proper stock levels, reducing the chances of shortages that could compromise patient care.

Furthermore, the healthcare sector often dealt with specialized and high-value products, such as medical devices and pharmaceuticals, which could yield higher profit margins. Effective inventory management in this context helped healthcare organisations maximize the return on their investment in these valuable items. By closely monitoring inventory turnover rates and strategically allocating resources to high-margin products, healthcare providers enhanced their GMROI and overall financial performance.

In summary, the dynamic nature of medical advancements, regulatory compliance, and the potential for profitable specialized products drove the healthcare sector to maintain high inventory turnover and GMROI. This approach ensured timely access to essential supplies, adherence to quality standards, and optimized financial resources, ultimately contributing to the sector's ability to provide quality patient care and drive sustainable growth.

5.1.4 Industrial Product & Service Sector

The industrial product and service sector experienced high inventory turnover and a propensity for high Gross margin return on inventory investment (GMROI) due to a combination of industry-specific factors that drove efficient inventory management and profitability. Firstly, the sector operated in a competitive landscape where demand for industrial goods and services could fluctuate based on economic cycles and infrastructure projects. This volatility necessitated agile inventory practices to swiftly respond to changing demand patterns, minimizing the risk of excess stock and capital tied up in inventory.

Secondly, industrial products often had relatively high production costs and longer manufacturing lead times. This encouraged businesses to optimize their inventory turnover to avoid the accumulation of costly inventory and associated holding costs. Effective inventory management ensured that resources were allocated efficiently, enabling companies to generate higher returns on their investment in production and procurement.

Additionally, the industrial sector frequently involved specialized and customizable products tailored to specific client needs. As a result, companies needed to carefully monitor

their inventory turnover to ensure a balanced mix of readily available components and materials, reducing lead times and improving customer satisfaction.

Furthermore, the industrial sector's emphasis on innovation and technological advancements could lead to the rapid obsolescence of products and components. To stay competitive, companies needed to maintain a dynamic inventory turnover strategy to minimize the risk of holding outdated inventory, thereby ensuring a focus on the latest market trends and technological developments.

In summary, the industrial product and service sector's characteristics, including demand volatility, production costs, customization requirements, and technological innovation, drove the need for high inventory turnover and GMROII. By efficiently managing their inventory, businesses adapted to changing market dynamics, optimized their resources, and capitalized on profitable opportunities, ultimately fostering growth and competitiveness within the industry.

5.1.5 Plantation Sector

The plantation sector experienced high inventory turnover and the potential for a high Gross margin return on inventory investment (GMROII) due to its unique operational dynamics and market conditions. Firstly, the plantation industry primarily involved the cultivation of crops, such as crops, fruits, or trees, which had relatively short growing cycles. This cyclic nature of production prompted companies to maintain efficient inventory turnover to ensure the timely harvesting, processing, and distribution of their products. Rapid turnover minimized the risk of overripe or spoiled crops, allowing plantations to optimize their yield and capitalize on favourable market conditions.

Secondly, the plantation sector was influenced by weather conditions, climate variations, and seasonal demand patterns. These variables necessitated agile inventory management to respond to changing circumstances promptly. By closely monitoring inventory turnover, plantation businesses aligned their production and distribution strategies with market fluctuations, reducing the risk of supply imbalances and lost opportunities.

Moreover, the perishable nature of many plantation products, like fruits and vegetables, emphasized the need for quick inventory turnover to maintain freshness and quality. It met consumer expectations and minimized waste and spoilage, contributing to higher GMROII by maximizing the value extracted from each unit of inventory.

Additionally, advancements in agricultural technology and cultivation practices led to increased yields and more efficient resource utilization. Efficient inventory turnover enabled plantations to incorporate these innovations effectively, enhancing their operational efficiency and profitability.

In summary, the plantation sector's reliance on timely cultivation and harvesting, coupled with the influence of weather and seasonality, drove the need for high inventory turnover and GMROII. By optimizing inventory practices, plantation businesses ensured the quality and freshness of their products, adapted to changing market dynamics, and ultimately achieved higher returns on their inventory investments.

5.1.6 Property Sector

The property sector experienced low inventory turnover and often contended with a relatively low Gross margin return on inventory investment (GMROII) due to the unique characteristics and dynamics of real estate. Firstly, properties, whether residential or commercial, typically involved high capital investments and more extended holding periods. Real estate assets required development, construction, and marketing time, resulting in extended inventory turnover cycles compared to other industries. This prolonged timeline lowered inventory turnover rates as properties might have remained unsold or under development for significant durations.

Secondly, the property market was influenced by various external factors such as economic cycles, interest rates, and local market conditions. These factors could lead to fluctuations in demand and potentially longer selling cycles, affecting the ability to achieve higher inventory turnover. The extended time it took to match suitable buyers with specific properties could limit the frequency at which properties changed hands.

Furthermore, the property sector often faced higher transaction costs, including taxes, legal fees, and commissions, which impacted profit margins. These costs, combined with the more extended holding periods, contributed to lower GMROII as these expenses could reduce the returns on each unit of inventory turnover. Additionally, real estate was a heterogeneous market with differing location, size, type, and condition properties. This diversity could result in a more complex and time-consuming sales process, further impacting inventory turnover rates and the potential for higher GMROII.

The property sector's characteristics, including high capital investments, longer holding periods, external market influences, and transaction costs, contributed to low inventory turnover and relatively lower GMROII. While real estate could offer significant potential returns over time, the market's complexities and properties' unique nature often led to a slower inventory turnover and challenges in achieving higher profit margins.

5.1.7 Technology Sector

The technology sector experienced high inventory turnover and a strong potential for a high Gross margin return on inventory investment (GMROII) due to its dynamic nature and rapid pace of innovation. Firstly, the technology industry was characterized by short product lifecycles and frequent advancements in hardware, software, and electronic components. This fast-paced environment compelled companies to manage their inventory efficiently to avoid accumulating obsolete products. High inventory turnover ensured that businesses remained agile and responsive to evolving consumer preferences and emerging technologies, minimizing the risk of holding excess or depreciating inventory.

Secondly, technological products often had relatively high-profit margins, especially in premium electronics, software licensing, and cutting-edge gadgets. Effective inventory management enabled companies to maximize their GMROII by focusing on high-margin items and optimizing their production, distribution, and sales processes to capture value from each unit of inventory sold.

Furthermore, the technology sector was influenced by factors like rapid technological obsolescence and fluctuating demand due to product cycles and market trends. It demanded

precise inventory turnover to balance supply and demand, minimize shortages or surpluses, and capitalize on opportunities presented by new product releases or innovations.

Additionally, the sector's reliance on global supply chains and just-in-time manufacturing strategies further emphasized the need for efficient inventory turnover. By maintaining lean inventories and closely monitoring turnover rates, technology companies reduced carrying costs, freed up capital for research and development, and enhanced their overall financial performance.

In summary, the technology sector's innovation-driven nature, short product lifecycles, and potential for high-profit margins incentivized businesses to pursue high inventory turnover and GMROII. By effectively managing their inventory, technology companies stayed competitive, adapted to rapid market changes, and optimized their resource allocation, ultimately contributing to their growth and success in this dynamic industry.

5.1.8 Transportation & Logistics Sector

The transportation and logistics sector experienced high inventory turnover. Due to its intricate operational nature, it often needed help achieving a relatively low Gross margin return on inventory investment (GMROII). Firstly, this sector involved moving and storing goods across vast networks, necessitating efficient inventory turnover to ensure timely and accurate deliveries. Rapid inventory turnover helped prevent delays, reduced storage costs, and maintained optimal supply chain operations by ensuring that products were readily available for transportation when needed.

Secondly, the transportation and logistics industry had thin profit margins due to intense competition and price-sensitive markets. Service providers often focused on offering competitive pricing to attract clients, which could limit the potential for higher profit margins. It impacted the GMROII, as the profit earned from each unit of inventory turnover was relatively modest.

Moreover, the sector operated in a dynamic environment with varying demand patterns, seasonal fluctuations, and evolving consumer preferences. These factors could lead to challenges in accurately forecasting demand, potentially resulting in excess inventory or

shortages. Such situations could impact inventory turnover and GMROII, as the balance between supply and demand became crucial for profitability.

The transportation and logistics sector also relied heavily on efficient resource utilization, including vehicles, warehouses, and labor. Operational costs associated with maintaining these resources could further impact profit margins and GMROII. Balancing the need for reliable inventory turnover with cost-effective operations became essential in this context.

In summary, the transportation and logistics sector's emphasis on fast-moving goods and competitive pricing and operational challenges contributed to high inventory turnover. However, the nature of the industry, including thin profit margins and demand variability, often resulted in a relatively low GMROII. Effective inventory management remained critical to maintaining efficient supply chain operations while navigating the transportation and logistics landscape complexities.



5.2 Conclusion

As the awareness of the consequences on inventory performance in the manufacturing sector rose, relatively few studies had been conducted on how inventory turnover and gross margin return on inventory investment (GMROII) might enhance or not the firm's inventory performance and profitability. The current paper was motivated by the close link in the literature concerning the relationship between inventory turnover and gross margin return on inventory investment (GMROII) of manufacturing companies in Malaysia's public listed sector.

Due to the conflicting findings from previous investigations into inventory concerns, the researcher focused on applying statistical tests to a larger and updated sample of manufacturing companies in Malaysia's public listed sector, spanning different manufacturing sectors. Therefore, the study utilized a selection of 260 manufacturing firms listed on Bursa Malaysia.

In terms of proxying for firm inventory performance and their relationship variables (inventory turnover and GMROII), the researcher focused on the "Analyzing Inventory Efficiency: Quadrant Inventory Turnover and GMROII" approach. This study demonstrated how manufacturing companies in Malaysia's public listed sector improved inventory planning and resource allocation for various products by leveraging inventory turnover and GMROII. Thus, inventory performance, as represented by the inventory turnover ratio, was found to determine firm inventory profitability.

5.3 Research Contribution

The outcomes of this research have made substantial contributions to the theoretical landscape and existing literature in multiple insightful dimensions. Firstly, the study shed new light on inventory management practices within Malaysia's publicly listed companies' manufacturing sector. By harnessing the potential of inventory turnover and GMROII, these organisations enhanced their inventory planning and resource allocation strategies across diverse products. This investigation enriched our comprehension of how inventory turnover ratios and GMROII served as pivotal performance indicators, thereby deepening our insights into their influence on the manufacturing industry.

Moreover, the research extended the boundaries of knowledge by delving into the intricate interplay between two crucial inventory management metrics. Over ten years, the

study uncovered invaluable insights into the evolving dynamics of inventory performance, juxtaposing a comprehensive decade-long period with a concise five-year interval. Through this temporal analysis, the researcher discerned companies' nuanced strategies to address their inventory challenges. This illumination underscored organisations' adaptive and strategic evolution, providing a unique perspective on the strategic metamorphosis that took place over time.

Lastly, this research expanded the theoretical horizons of inventory management and empirically showcased the strategic significance of inventory turnover and GMROII in optimising resource allocation. Furthermore, it unveiled the temporal dimension of inventory performance, revealing the profound transformations that organisations experienced as they strove for operational excellence.



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Appendix A: Name List 260 Company from Bursa Malaysia (Manufacturing Sector)

I. Construction Sector

Construction Sector		
Company	Name	Manufacturing Sector
Company 23	Benalec Holdings Berhad	Construction
Company 92	Eversendai Corporation Berhad	Construction
Company 108	Gadang Holdings Bhd	Construction
Company 109	Geogre Kent (Malaysia) Berhad	Construction
Company 141	Ho Hup Construction Company Bhd	Construction
Company 154	Ireka Corporation Berhad	Construction
Company 156	Jaks Resources Berhad	Construction
Company 169	Kerjaya Prospek Group Berhad	Construction
Company 200	Metro Holdings Berhad	Construction
Company 220	Pesona Metro Holdings Berhad	Construction
Company 225	Pimpinan Ehsan Berhad	Construction
Company 243	Protasco Berhad	Construction
Company 246	Puncak Niaga Holdings Berhad	Construction

II. Consumer Product & Service Sector

Consumer Product & Service Sector					
Company	Name	Manufacturing Sector	Company	Name	Manufacturing Sector
Company 1	7-Eleven Malaysia Holdings Behad	Consumer Product & Services	Company 82	Eng Kah Corporation Berhad	Consumer Product & Services
Company 5	Advance Synergy Berhad	Consumer Product & Services	Company 87	Esthetics International Group Berhad	Consumer Product & Services
Company 9	Amway (Malaysia) Holdings Berhad	Consumer Product & Services	Company 89	Euro Holdings Berhad	Consumer Product & Services
Company 15	Apollo Food Holdings Berhad	Consumer Product & Services	Company 90	Europas Holdings Berhad	Consumer Product & Services
Company 16	Asia Brands Berhad	Consumer Product & Services	Company 97	FCW Holdings Berhad	Consumer Product & Services
Company 18	Avillion Berhad	Consumer Product & Services	Company 99	Fiamma Holdings Berhad	Consumer Product & Services
Company 26	Berjaya Food Berhad	Consumer Product & Services	Company 103	Focus Point Holdings Berhad	Consumer Product & Services
Company 27	Berjaya Land Berhad	Consumer Product & Services	Company 104	Formosa Prosonic Industries Berhad	Consumer Product & Services
Company 29	Beshom Holdings Berhad	Consumer Product & Services	Company 105	Fraser & Neave Holdings Bhd	Consumer Product & Services
Company 31	Bonia Corporation Berhad	Consumer Product & Services	Company 106	G3 Global Berhad	Consumer Product & Services
Company 37	C.I. Holdings Berhad	Consumer Product & Services	Company 107	MBM Resources Bhd	Consumer Product & Services
Company 38	CAB Cakaran Corporation Berhad	Consumer Product & Services	Company 115	Salutica Berhad	Consumer Product & Services
Company 40	CAM Resources Berhad	Consumer Product & Services	Company 116	Padini Holdings Berhad	Consumer Product & Services
Company 43	Carlsberg Brewery Malaysia Berhad	Consumer Product & Services	Company 117	Pan Malaysia Holdings Berhad	Consumer Product & Services
Company 45	CCK Consolidated Holdings Berhad	Consumer Product & Services	Company 118	Panasonic Manufacturing Berhad	Consumer Product & Services
Company 48	Cheetah Holdings Berhad	Consumer Product & Services	Company 119	Pan Malaysia Corporation Berhad	Consumer Product & Services
Company 52	China Ouhua Winery Holdings Limited	Consumer Product & Services	Company 126	Greenfield Berhad	Consumer Product & Services
Company 53	Classic Scenic Berhad	Consumer Product & Services	Company 128	Guan Chong Berhad	Consumer Product & Services
Company 54	Caely Holdings Berhad	Consumer Product & Services	Company 135	HB Global Limited	Consumer Product & Services
Company 64	CWG Holdings Berhad	Consumer Product & Services	Company 137	Heineken Malaysia Berhad	Consumer Product & Services
Company 73	DRB-Hicom Berhad	Consumer Product & Services	Company 145	Hup Sneg Industries Berhad	Consumer Product & Services
Company 74	Dutch Lady Milk Industries Berhad	Consumer Product & Services	Company 146	Hwa Tai Industries Berhad	Consumer Product & Services

Consumer Product & Service Sector

Company	Name	Manufacturing Sector
Company 149	Iconic Worldwide Berhad	Consumer Product & Services
Company 164	Kawan Food Berhad	Consumer Product & Services
Company 171	Khind Holdings Berhad	Consumer Product & Services
Company 188	Lay Hong Berhad	Consumer Product & Services
Company 191	Lee Swee Kiat Group Berhad	Consumer Product & Services
Company 193	MESB Berhad	Consumer Product & Services
Company 194	Lii Hen Industries Bhd	Consumer Product & Services
Company 195	LTSM Berhad	Consumer Product & Services
Company 199	Magni-Tech Industries Berhad	Consumer Product & Services
Company 202	Paos Holdings Berhad	Consumer Product & Services
Company 204	Paragon Union Berhad	Consumer Product & Services
Company 206	Parkson Holdings Berhad	Consumer Product & Services
Company 210	PCCS Group Berhad	Consumer Product & Services
Company 214	Pelikan International Corporatio Berhad	Consumer Product & Services
Company 217	Perak Transit Berhad	Consumer Product & Services
Company 218	Permaju Industries Berhad	Consumer Product & Services
Company 219	Pertama Digital Berhad	Consumer Product & Services
Company 232	Poh Huat Resources Holdings Berhad	Consumer Product & Services
Company 233	Poh Kong Holdings Berhad	Consumer Product & Services
Company 234	Power Root Berhad	Consumer Product & Services
Company 235	PPB Group Berhad	Consumer Product & Services

Company	Name	Manufacturing Sector
Company 238	PRG Holdings Berhad	Consumer Product & Services
Company 241	Prolexus Berhad	Consumer Product & Services
Company 247	PWF Corporatio Berhad	Consumer Product & Services
Company 249	QL Resources Berhad	Consumer Product & Services
Company 255	SDS Group Berhad	Consumer Product & Services
Company 257	Rex Industry Berhad	Consumer Product & Services
Company 258	RCB International Bhd	Consumer Product & Services
Company 259	Phone Ma Holdings Berhad	Consumer Product & Services

III. Health Care Sector

Health Care Sector

Company	Name	Manufacturing Sector
Company 6	Adventa Berhad	Health Care
Company 14	Apex Healthcare Berhad	Health Care
Company 42	Careplus Group Berhad	Health Care
Company 134	Hartalega Holdings Berhad	Health Care
Company 179	KPJ Healthcare Berhad	Health Care
Company 224	Pharmaniaga Berhad	Health Care

IV. Transportation & Logistics Sector

Transportation & Logistics Sector

Company	Name	Manufacturing Sector
Company 49	Chin Hin Group Property Berhad	Transportation & Logistics
Company 143	Hubline Berhad	Transportation & Logistics
Company 211	PDZ Holdings Bhd	Transportation & Logistics
Company 216	Perak Corporation Berhad	Transportation & Logistics

V. Industrial Product & Service Sector

Industrial Product & Service Sector

Company	Name	Manufacturing Sector	Company	Name	Manufacturing Sector
Company 2	A-Rank Berhad	Industrial Product & Services	Company 44	CB Industrial Product Holding Berhad	Industrial Product & Services
Company 3	Ablegroup Berhad	Industrial Product & Services	Company 46	Central Global Berhad	Industrial Product & Services
Company 4	ABM Fujiya Berhad	Industrial Product & Services	Company 51	Chin Well Holdings Berhad	Industrial Product & Services
Company 7	Ajiya Berhad	Industrial Product & Services	Company 55	Comintel Corporation Berhad	Industrial Product & Services
Company 8	Malaysia Steel Works (KL) Bhd	Industrial Product & Services	Company 56	Compugates Holdings Berhad	Industrial Product & Services
Company 10	Analabs Resources Berhad	Industrial Product & Services	Company 57	Computer Forms (Malaysia) Berhad	Industrial Product & Services
Company 11	Ancom Nylex Berhad	Industrial Product & Services	Company 58	Concrete Engineering Products Berhad	Industrial Product & Services
Company 12	Ann Joo Resourcer Berhad	Industrial Product & Services	Company 63	CSC Steel Holdings Berhad	Industrial Product & Services
Company 13	Apb Resources Berhad	Industrial Product & Services	Company 68	S & F Capital Berhad	Industrial Product & Services
Company 17	Ata Ims Berhad	Industrial Product & Services	Company 69	Destini Berhad	Industrial Product & Services
Company 19	AWC Berhad	Industrial Product & Services	Company 70	Dolphin International Berhad	Industrial Product & Services
Company 21	AYS Ventures Berhad	Industrial Product & Services	Company 71	Dominant Enterprise Berhad	Industrial Product & Services
Company 25	Berjaya Corporation Berhad	Industrial Product & Services	Company 77	EG Industries Berhad	Industrial Product & Services
Company 30	Boilermach Holdings Berhad	Industrial Product & Services	Company 78	EITA Resources Berhad	Industrial Product & Services
Company 32	Borneo Oil Berhad	Industrial Product & Services	Company 79	Eksons Corporation Berhad	Industrial Product & Services
Company 33	Box-Pak (Malaysia Berhad)	Industrial Product & Services	Company 83	Engtex Group Berhad	Industrial Product & Services
Company 34	BP Plastics Holding Berhad	Industrial Product & Services	Company 85	Eonmentall Group Berhad	Industrial Product & Services
Company 35	Bright Packaging Industry Berhad	Industrial Product & Services	Company 86	EP Manufacturing Berhad	Industrial Product & Services
Company 36	BTM Resources Berhad	Industrial Product & Services	Company 91	Evergreen Fibreboard Berhad	Industrial Product & Services
Company 39	Cahaya Mata Sarawak Berhad	Industrial Product & Services	Company 94	Facb Industries Incorporated Berhad	Industrial Product & Services
Company 41	CAN-One Berhad	Industrial Product & Services	Company 96	Favelle Favco Berhad	Industrial Product & Services

Industrial Product & Service Sector

Company	Name	Manufacturing Sector	Company	Name	Manufacturing Sector
Company 100	Fibon Berhad	Industrial Product & Services	Company 165	Keck Seng (Malaysia Berhad)	Industrial Product & Services
Company 101	Fima Corporation Berhad	Industrial Product & Services	Company 166	Kein Hing International Berhad	Industrial Product & Services
Company 102	Focus Lumber Berhad	Industrial Product & Services	Company 167	Samaiden Group Berhad	Industrial Product & Services
Company 111	Ornapaper Berhad	Industrial Product & Services	Company 172	Kia Lim Berhad	Industrial Product & Services
Company 113	P.A. Resources Berhad	Industrial Product & Services	Company 173	Kim Hin Industry Berhad	Industrial Product & Services
Company 114	P.J.E Industrial Berhad	Industrial Product & Services	Company 175	Melewar Industries Group Berhad	Industrial Product & Services
Company 120	Pansar Berhad	Industrial Product & Services	Company 176	KKB Engineering Berhad	Industrial Product & Services
Company 122	Globaltec Formation Berhad	Industrial Product & Services	Company 177	Kobay Technology Berhad	Industrial Product & Services
Company 125	Gloden Pharos Berhad	Industrial Product & Services	Company 178	Komarkcorp Berhad	Industrial Product & Services
Company 129	Guh Holdings Berhad	Industrial Product & Services	Company 180	KPS Consortium Berhad	Industrial Product & Services
Company 131	Hap Seng Consolidated Berhad	Industrial Product & Services	Company 183	Kumpulan Fima Berhad	Industrial Product & Services
Company 133	Sam Engineering & Equipment (M) Berhad	Industrial Product & Services	Company 184	Kumpulan H & L High-Tech Berhad	Industrial Product & Services
Company 138	Heveaboard Berhad	Industrial Product & Services	Company 185	Kumpulan Jetson Berhad	Industrial Product & Services
Company 139	Hextar Global Berhad	Industrial Product & Services	Company 186	KYM Holdings Berhad	Industrial Product & Services
Company 140	HIL Industries Berhad	Industrial Product & Services	Company 189	LB Aluminium Berhad	Industrial Product & Services
Company 144	Hume Cement Industries Berhad	Industrial Product & Services	Company 192	Leon Fuat Berhad	Industrial Product & Services
Company 150	Imaspro Corporation Berhad	Industrial Product & Services	Company 196	Luster Industries Bhd	Industrial Product & Services
Company 155	Jade Marvel Group Berhad	Industrial Product & Services	Company 197	Lysaght Galvanized Steel Berhad	Industrial Product & Services
Company 157	Jasa Kita Berhad	Industrial Product & Services	Company 201	Pantech Group Holdings Berhad	Industrial Product & Services
Company 162	Joe Holdings Berhad	Industrial Product & Services	Company 209	Samchem Holdings Berhad	Industrial Product & Services
Company 163	K. Seng Seng Corporation Berhad	Industrial Product & Services	Company 212	PECCA Group Berhad	Industrial Product & Services

Industrial Product & Service Sector

Company	Name	Manufacturing Sector
Company 221	Pestech International Berhad	Industrial Product & Services
Company 222	Sapura Industrial Berhad	Industrial Product & Services
Company 223	Poly Glass Fibre (M) Berhad	Industrial Product & Services
Company 230	PMB Technology Berhad	Industrial Product & Services
Company 231	PNE PCB Berhad	Industrial Product & Services
Company 236	Pres Metal Aluminium Holdings Berhad	Industrial Product & Services
Company 237	Prestar Resources Berhad	Industrial Product & Services
Company 239	Priceworth International Berhad	Industrial Product & Services
Company 240	Progressive Impact Corporation Berhad	Industrial Product & Services
Company 245	Public Packages Holdings Bhd	Industrial Product & Services
Company 248	QES Group Berhad	Industrial Product & Services
Company 250	Quality Concrete Holdings Berhad	Industrial Product & Services
Company 252	Ralco Corporation Berhad	Industrial Product & Services
Company 253	Scanwolf Corporation Berhad	Industrial Product & Services
Company 254	SCGM Bhd	Industrial Product & Services
Company 256	Resintech Berhad	Industrial Product & Services

VI. Plantation Sector

Company	Name	Manufacturing Sector
Company 47	Cepatwawasan Group Berhad	Plantation
Company 50	Chin Teck Plantations Berhad	Plantation
Company 67	Rimbunan Sawit Berhad	Plantation
Company 98	FGV Holdings Berhad	Plantation
Company 132	Hap Seng Plantations Holdings Berhad	Plantation
Company 152	Inch Kenneth Kajang Rubber Public Ltd Co	Plantation
Company 153	Innoprise Plantations Berhad	Plantation
Company 158	Jaya Tiasa Holdings Berhad	Plantation
Company 174	Kim Loong Resources Berhad	Plantation
Company 181	Kertam Holdings Berhad	Plantation
Company 182	Kuala Lumpur Kepong Berhad	Plantation
Company 226	Pinehill Pacific Berhad	Plantation
Company 229	PLS Plantations Berhad	Plantation
Company 260	Riverview Rubber Estates Berhad	Plantation

VII. Property Sector

Property Sector					
Company	Name	Manufacturing Sector	Company	Name	Manufacturing Sector
Company 20	Axteria Group Berhad	Property	Company 142	Hua Yang Berhad	Property
Company 22	BCB Berhad	Property	Company 147	I-Berhad	Property
Company 24	Berjaya Assets Berhad	Property	Company 148	Ibraco Berhad	Property
Company 59	Country Heights Holdings Bhd	Property	Company 168	Ken Holdings Berhad	Property
Company 60	Country View Berhad	Property	Company 170	Kerjaya Prospek Property Berhad	Property
Company 61	Crescendo Corporation Berhad	Property	Company 187	Lagenda Properties Berhad	Property
Company 62	Malaysia Resources Corporation Berhad	Property	Company 190	Menang Corporation (M) Berhad	Property
Company 72	DPS Resources Berhad	Property	Company 198	Magna Prima Berhad	Property
Company 75	Eastern & Oriental Berhad	Property	Company 203	Paragon Globe Berhad	Property
Company 76	Eco World Development Group Berhad	Property	Company 205	Paramount Corporation Berhad	Property
Company 81	Encorp Berhad	Property	Company 207	Parkwood Holdings Berhad	Property
Company 84	Malton Berhad	Property	Company 208	Pasdec Holdings Berhad	Property
Company 88	Eupe Corporation Berhad	Property	Company 213	Pegasus Heights Berhad	Property
Company 93	Ewein Berhad	Property	Company 227	PLB Engineering Berhad	Property
Company 95	Farlim Group (Malaysia) Bhd	Property	Company 228	Plenitude Berhad	Property
Company 112	Osk Holdings Berhad	Property	Company 242	SBC Corporation Berhad	Property
Company 121	Global Oriental Berhad	Property	Company 244	PTT Synergy Group Berhad	Property
Company 124	Glomac Berhad	Property	Company 251	Radium Development Berhad	Property
Company 127	Gromutual Berhad	Property			
Company 130	Guocoland (Malaysia) Berhad	Property			
Company 136	HCK Capital Group Berhad	Property			

VIII. Technology Sector

Technology Sector		
Company	Name	Manufacturing Sector
Company 28	Malaysia Pacific Industries Berhad	Technology
Company 65	D&O Green Technologies Berhad	Technology
Company 66	Dataprep Holdings Bhd	Technology
Company 80	Elsoft Research Berhad	Technology
Company 110	GHL Systems Berhad	Technology
Company 123	Globetronics Technology Berhad	Technology
Company 151	Inari Amertron Berhad	Technology
Company 159	JCY International Berhad	Technology
Company 160	JF Technology Berhad	Technology
Company 161	JHM Consolidation Berhad	Technology
Company 215	Pentamaster Corporation Berhad	Technology