

East Tennessee State University

Digital Commons @ East Tennessee State University

Undergraduate Honors Theses

Student Works

5-2022

Exploring Inventory Management's Effects on a Company's Profitability

Mason Frye

Follow this and additional works at: <https://dc.etsu.edu/honors>



Part of the [Business Administration, Management, and Operations Commons](#), and the [Management Information Systems Commons](#)

Recommended Citation

Frye, Mason, "Exploring Inventory Management's Effects on a Company's Profitability" (2022). *Undergraduate Honors Theses*. Paper 695. <https://dc.etsu.edu/honors/695>

This Honors Thesis - Open Access is brought to you for free and open access by the Student Works at Digital Commons @ East Tennessee State University. It has been accepted for inclusion in Undergraduate Honors Theses by an authorized administrator of Digital Commons @ East Tennessee State University. For more information, please contact digilib@etsu.edu.

**Exploring Inventory Management's Effects on a Company's
Profitability**

By:
Mason Frye

An Undergraduate Thesis Submitted in Partial Fulfillment of the
Requirements for the Honors-In-Discipline Program

Honors College
College of Business and Technology
East Tennessee State University

 4-22-22

Mason Frye

Date

 4/23/22

Bill McTier, *Thesis Advisor*

Date

 4/24/2022

Dr. Umit Saglam, *Thesis Reader*

Date

Abstract

Effective inventory management policy is a recognizable critical driver for company success, but which techniques and tools are relevant today? This thesis explores the theory that a company's inventory management practices directly impact the firm's efficiency, responsiveness, and profitability. Research from previously published studies on inventory management is shared to develop a framework of understanding to answer the question of relevancy. Additionally, interviews with successful business professionals within the field provide additional insight into specific inventory management practices that affect profitability and performance. Moreover, these professionals discuss how the practices are effectively applied in the real world today. Finally, this thesis will explore specific challenges the coronavirus pandemic presents for inventory managers across the globe and strategies that industry professionals are utilizing to manage through these taxing times.

INTRODUCTION

This thesis is a qualitative study on inventory management's effects on profitability and what types of tools, techniques, standards, and ideologies are relevant in determining the overall impact on profitability. This thesis explores these topics in a literal sense of the term and relates them to real-world scenarios to better apply the information found in the research phase. Research on profitability measures such as profits, profit margins, and lowering overall cost will serve as the standard for measuring profitability during this study.

Research Scope

While studying inventory management's effects on a company's profitability, the main focus is the essential tools and techniques still relevant in the current business climate while also discovering what role they fulfill related to profitability. Therefore, this study aims to identify these relevant tools and techniques and to discuss and exemplify their use within business in an easily understood method. Additionally, the coronavirus pandemic will be studied as it relates to global business and how it has affected profitability since its origin in the first quarter of 2020.

Limitations

A limitation of this study is that it is a qualitative research-based study. The research methods used within this thesis are in greater detail in the methodology section. However, it should be made aware that the most current methodologies are incorporated to minimize any limitations within the thesis research.

Another limitation would be that only topics relating to inventory management were considered when looking for factors affecting a company's profitability. Many other factors should be reviewed when evaluating a company's profitability on an executive level, but for the purpose of this thesis, they were excluded from the study.

The final limitation relating to this study is the potential for researcher bias to influence what secondary data is reviewed, chosen, and included within this study by the researcher. This bias is not intentional, but should be made aware as the researcher will choose what data and information to include in the study based on their values.

Purpose of the Study

The purpose of this research is to determine what effect(s) inventory management has on a company's profitability. As stated in the Research Scope portion, this thesis will transform the

information gathered from research into real-world applications and relate them to businesses in nearby proximity to East Tennessee State University, such as Eastman Chemical Company.

Description of Terms

Inventory Management: "Inventory management refers to ordering, storing, using, and selling a company's inventory. This includes the management of raw materials, components, and finished products and warehousing and processing of such items." (Hayes, 2022).

Profitability: Profitability is a measurement of efficiency – and ultimately its success or failure. A further definition of profitability is a business's ability to produce a return on an investment based on its resources compared to an alternative investment." (Horton, 2021).

Conclusion

Data suggests a relationship between well-maintained inventory management and a company's profitability. However, what tools, techniques, standards, and ideologies are relevant in assessing this relationship? This remains to be the primary focus of this thesis.

METHODOLOGY

Introduction

This section aims to discuss the methodology used to investigate inventory management and its effects on a company's profitability. Additionally, this section includes a justification of the research design theory applied. The methodology of this section is modeled after the "Research Onion Theory" (2007) by Saunders et al. to clearly define and outline why the research is structured the way it is.

Research Design Theory

Research Philosophy

Myers (2008) claims that most business-oriented case studies use the interpretivism research philosophy due to its observational nature related to business research. Given that this research uses qualitative research methods, it is apparent that interpretivism research philosophy is also present. This means the researcher interprets the fundamentals of the study and the meaning of the data for the thesis. Since this study is qualitative and contains no quantitative analysis, interpretivism is the research philosophy applied in this thesis.

Research Type

The research for this study was inductive, meaning that the research was constructed from the ground up. Inductive research focuses on experience and patterns combined to generate a hypothesis rather than a quantitative analysis. (Goddard and Melville, 2004). This thesis' study will conclude by forming a hypothesis instead of a statistical/causational conclusion, furthering the appropriation of the inductive research type.

Research Strategy

The nature of this research falls within the archival research category of research strategies. Georgia State University's library defines *archival research* as "research involving primary sources held in archives, a Special Collections library, or another repository." The following examples can serve as archival sources: documents, records, objects, and sound and audiovisual materials (Georgia State University Library). Utilizing a research strategy like archival research will provide a strong foundation for the thesis grounded upon previous researchers' findings.

Sampling Strategy

The sampling strategy for this thesis includes both non-probability and non-randomized strategies. Since the researcher chose the topics discussed in this thesis, the findings are a part of

the non-probable section of the research sample. Furthermore, given that the researcher subjectively selected the information in the thesis and all topics had an equal chance to be included, all information included from previous sources also falls under the non-randomized section of the research sample.

Data Collection

As mentioned previously, the type of data collection used in this study is archival research. This includes retrieving archived reports, published master's theses, doctoral dissertations, and other similar types of documents. Additionally, information will be gathered from other sources, such as annual reports from Eastman Chemical Company and online statistics collection.

Literature Review

Inventory management is critical to many firms' success and sustainability. Therefore, it requires management priority and scrutiny. Golas (2020) states that, "based on panel regression models, one study demonstrated that an improvement in inventory management efficiency is positively correlated with financial performance, measured as the return on operating assets." (ROA). Additionally, statistical evidence conveys the significance of inventory impact on the global and domestic economy and as a macroeconomic indicator. "Historically, a declining growth rate in the inventories-to-sales ratio has coincided with increased economic output." (Kalivas, 2018). Moreover, inventory is a critical component in many categories of firms, industries, and supply chain investments. "Companies can reap a 25% increase in productivity, a 20% gain in space usage, and a 30% improvement in stock use efficiency if they use integrated order processing for their inventory system." (EasyPost, 2019). Before exploring specific inventory management practices and their impact on profitability, it is essential to review the relevant research on fundamental inventory practices. The review of these practices will help provide a framework for our discussion.

Thomas Lee Herzig researched last-in, first-out (LIFO) and first-in, first-out (FIFO) inventory management policies and their effects on profits and cash flow while studying at the University of Wisconsin-Milwaukee. Some of the generalized points that Herzig finds in his research consist of the advantages and disadvantages of both LIFO and FIFO, laying out the parameters of the study/project he will be conducting, and different scenarios that could happen when evaluating FIFO and LIFO conditions. According to Herzig, FIFO is better when the conditions consist of low inventory turnover and rising prices because profits are inflated due to

inventory profit, while LIFO under these same conditions would limit inventory profits (Herzig, 1976).

The article "Inventory Management: Controlling Costs to Maximize Profits" provided some excellent insight into how consistent inventory evaluation can improve lead time, help process customer orders efficiently, and maximize storage space and equipment. According to the report, "Inventory reviews are best conducted by an auditing team of managers whose jobs relate to materials planning, acquisition, handling, and storage." (Anonymous, 1987, p. 50). There are several fundamental ratios mentioned in the article that measure materials handling efficiency. The ratios include storage space utilization (a measurement of how efficiently a company is using their storage facilities), inventory fill (the amount of inventory in customer orders expressed as a percentage of the total inventory), materials handling/labor (the percentage of labor being used to exercise materials handling), among others. Utilizing these ratios allows companies to measure the improvement, or lack thereof, of materials handling effectiveness.

Liu Yang, a former Durham University business school student, focuses on how improving order fulfillment and optimizing inventory can enhance profitability. According to Yang, employing inventory classification systems and scrutinizing inventory costs are "essential to the company's short-term profitability and long-term customer relationships." (Yang, 2016, p. 3). Compelling reasons to classify inventory include simplifying inventory audits, reducing the amount of stock on hand by increasing the inventory turnover ratio, and enabling businesses to fill limited inventory space with more profitable products. For example, if a company procures 1,000 units of inventory of a product that sells ten units per month, it will experience associated inventory carry costs for years to come. This assumes that the product does not perish or become obsolete over the period. Developing an appropriate inventory classification system and

conducting regular audits alert managers to slow-moving items and stimulate actions to correct the issues before efficiency and profitability are impacted.

Inventory classification relative to effective inventory management provides many benefits. The advantages include focusing on inventory items that generate the most profit and revenue, managing the most critical items more closely, and improving efficiency, speed, and accuracy by investing in an automated inventory management system to manage the less essential items. Dr. Joseph Cavinato assessed thirteen different inventories that a company might store in its warehouse(s) and how companies should manage each. Cavinato discusses Raw Materials and Components, Work-In-Progress Goods, Finished Goods, Resale Goods, Company Supplies, and Spare Parts for Sale. Cavinato also discusses Promotional Materials for Marketing/Sales, Trade-In Goods, Return/Rework Goods, and Idle Capital Goods, amongst several others. Cavinato proposes that managers should know what types of inventories they have and understand how they work to classify, manage, and distribute their inventory more efficiently.

Martin P. Edelman discusses the importance of inventory turnover and understanding how to calculate and apply this crucial inventory management ratio. Edelman defined *inventory turnover* as "a measure of how well your inventory investment is working for you" (Edelman, 1990, p. 51) as well as "the number of times that an inventory "turns over" or cycles during the year." (Edelman, 1990, p. 51) The formula for calculating inventory turnover is the annual cost of sales divided by the annual inventory cost. The benefit of more inventory turns is lower inventory costs, improved cash flow, and potentially higher revenue and profits.

An example of the impact of inventory turns on business comes from an article by Larry P. Vellequette entitled, "OVERSTUFFED: Near-record inventories eat dealer profits as floorplan

costs surge." The article focuses on automobile manufacturers, the dealerships selling their autos, and how they are losing money as inventory turns on their cars are seemingly becoming slower. Vellequette states, "if a downturn comes, dealers sitting on big inventories could find themselves in a great deal of trouble." (Vellequette, 2019, p. 10). During an economic downturn, companies that sit on these large numbers of cars will be hurting because they have paid out large sums of money to acquire these cars that are just collecting dust on their lots. Simply put, if inventory cannot sell, companies cannot turn the inventory into cash needed for covering operating expenses, generating profits, and fueling growth.

Indiana University's Stephen Mahar wrote a dissertation regarding inventory and distribution strategies for retail/e-tail organizations. Many omnichannel companies use brick-and-mortar stores to pick, pack, and ship online orders. Mahar discusses an online fulfillment assignment model that companies can use to help with their single and multi-product online orders and deliveries. This model allows for the process viewing from multiple ordering viewpoints. In addition, understanding how different order and delivery processes operate allows for more straightforward implementation into a new business, creating a new revenue stream for the business.

Boray Huang's dissertation about inventory policies in a supply chain with information systems was written in 2004 when businesses began utilizing the Internet and EDI (Electronic Data Interchanges) to improve their supply chain's performance in several aspects. EDI, electronic exchange of documents between business partners, allows inventory managers to better communicate through the supply chain. This faster and more efficient communication can allow them to replenish depleting inventory levels and fulfill customer orders quickly. Huang also goes into detail about how utilizing EDI, the Internet, and other technology properly can

give businesses a competitive advantage over their competition. Moreover, in the age of coronavirus, more and more companies are encouraging their employees to work from home. Other electronic aiding tools like Zoom/Microsoft Teams, email, instant messaging, and inventory monitoring systems allow employees to work remotely while maintaining efficiency. Improved technology and efficiency in combination enhance a firm's profitability.

Additional technology tools that enhance customer convenience and the customer experience can also reduce costs. ASAP Systems is one of the world's leaders in inventory systems and asset tracking. In 2019, PR Newswire published an excerpt that explained their new Inventory Cart Module. "The Inventory Cart Module offers the ability for users to log into their warehouse to browse their available inventory and add items to their Shopping Cart." (ASAP Systems, 2019, p. 2). ASAP Systems allows suppliers to limit the amount and the specific data that the users logging in can view. They can limit this within the software before the service goes live to their customer base. This gives companies the service of allowing their customers to log in and view available products and place their orders without wasting time communicating this information over the phone or email. Another benefit of this program is the ability to save paper from being sent back and forth, causing potential miscommunication if the papers were to get lost, while also helping companies stay green. All of this is accomplished without having to display any more information than the company feels necessary.

Another essential inventory management tool is the RFID (Radio Frequency Identification) system. RFID systems use radio frequencies to wirelessly communicate across devices to identify a product, object, or anything else that a company may require to identify/track. RFID systems "[Reduce] the time required and labor associated with cycle counts and allows warehouse owners the ability to perform more frequent cycle counts (daily/weekly)

without disrupting day to day activities" (RFID Inventory Systems, Inc., 2016, p. 4). The source also shares examples of organizations that use RFID technology, including T&W Operations, Inc., a Service-Disabled Veteran-Owned (SDVO) small business, and "Alien Technology is a leading technology and product provider of UHF Radio Frequency Identification (RFID) Integrated Circuits (IC), tags, readers and professional services." (RFID Inventory Systems, Inc., 2016, p. 15).

The coronavirus has presented challenges that the business world is still trying to overcome. Shortages in many essential products and components, increased demand for many goods with a lowered supply availability, and inflated prices on everyday goods are only a few of the initial challenges created by the pandemic. For example, according to a NASDAQ OMX article, the coronavirus caused a massive shortage of PPE (Personal Protective Equipment) in the initial phases of the pandemic. In addition, it forced some medical professionals to find new PPE gear to use in their jobs. According to the article, "Other trends affecting the PPE supply chain are strategic national stockpiles, demographic changes in the working population, new business models manufacturers' focus on comfort, and resource scarcity." (NASDAQ QMX, 2021, p. 4).

Emerald Publishing published a review in 2021 about how different industries suffer from the coronavirus. For example, "COVID-19 caused the free movement of goods to become restricted, with particular issues arising from the cessation of transporting raw materials in many industries." (Emerald Publishing Limited, 2021, p. 23) There is a continuous demand for these goods, but companies are still trying to get their inventory levels up to par. The article details the harsh effects that the food industry has had to go through during the pandemic and how they are only now beginning to show signs of recovery. Finally, the article discusses the pandemic's influence on consumer behavior unpredictability, spending habits, adopting new habits from the

business perspective, developing agile production processes, and modifying inventory policies to better align with current conditions.

Discussion

Inventory management is critical to a company's success because it helps determine the proper amount of inventory to have on hand to limit stockouts, inventory carrying costs, and inaccurate records. Therefore, it is essential to discuss some of the companies' effective practices to manage and control inventory effectively. Topics and practices including successful supply chain management, appropriate inventory management methods, accurate inventory counting methods, inventory turns optimization, and intuitive inventory classification systems are all relevant to effective IM policy. Additionally, this discussion will address modern technology applications pertinent to IM policy and address IM challenges within the framework of the coronavirus pandemic.

Inventory management methods such as first-in, first-out (FIFO), and last-in, first-out (LIFO) are prevalent in nearly every company. With FIFO, the company's first piece of inventory in possession is the first one to leave when the inventory unit is used or sold. Whereas in LIFO, the last piece of inventory that comes into the company's possession is the first one to leave when the inventory unit is used or sold. It is at the company's discretion to decide which method is best for its business. Companies do not necessarily have to commit to one method exclusively. For example, Eastman Chemical Company, based in Kingsport, Tennessee, determines the cost of most raw materials, work in process, and finished goods inventories in the United States and Switzerland by the LIFO method.

In contrast, the cost of all other inventories is determined by the average cost method, approximating the FIFO method. The average cost method is when companies assign inventory a cost based on the total cost of that inventory in a given period divided by the total number of items purchased in the same period. (Tuovila, 2020). Therefore, LIFO tends to be better for tax purposes as many companies will switch to LIFO alone. However, companies risk creating a batch of inventory that becomes old and potentially obsolete with LIFO. If the company's inventory becomes obsolete, it can lose money through profit margins because it either has to sell the inventory to secondary markets or destroy it if the inventory is a perishable item. Therefore, switching from one method to another can reduce the value of the company's inventory and working capital while also running the risk of violating debt covenants and having loans or lines of credit restricted (Herzig, 1976). Another consideration when switching between FIFO and LIFO, several government regulations and forms must be submitted promptly to avoid accruing additional government fines or penalties. Moreover, switching to LIFO is irrevocable for a business unless they obtain permission from the Internal Revenue Service (IRS) to convert to a different method. So, each company must weigh its options and assess its inventory to determine which method(s) will help it achieve the optimal profit and the lowest tax liability.

An important metric for companies to maintain within their inventory management system is inventory classification. Classifying a company's inventory is important because it allows management to see trends in inventory sales from period to period. For example, the table in appendix 1.1 shows that inventory is classified into three categories in Eastman Chemical Company's 2020 annual report. By properly classifying its inventory, Eastman can see the changes in the different categories from year to year. Perhaps if one area of its inventory is consistently struggling, managers can assess what that specific area requires to become more

profitable. While Eastman only uses a handful of various inventory classification types, there are numerous others commonly used across the world:

- Resale Goods are finished goods received and shipped with a few changes.
- Company Supplies are maintenance, operating, or office goods in which the company is the final user.
- Spare Parts for Sale are extra or leftover parts of finished goods that the company can sell to other firms.
- Promotional Materials are catalogs, brochures, or information packets that promote the company.
- Return/Rework Goods are goods that were either returned to the company within the allowed time frame or warranty claimed repairs/returns.
- Idle Capital Goods are goods the company will use in future installations. (Cavinato)

Another benefit to companies classifying their inventory is that it can help managers manage their products more effectively. Not every type of inventory is managed the same way because each is unique. Being flexible enough to manage each type of inventory will help the company get the most out of its products and increase revenue and profitability. The primary reason for using inventory classification is that the number of SKUs is too large for companies to implement an inventory control policy for each item (Ernst and Cohen, 1990). Companies typically have stock measuring devices like SKUs (Stock Keeping Units) to help them keep track of their inventory. A SKU is a scannable bar code that allows the company to easily track their goods' movement. Additionally, classifying the company's inventory into sections allows data analysts to see which inventories are most profitable and which ones are not. Finally, inventory classification allows the company to either increase the stock levels of the most profitable

inventory items or determine why specific inventory items are not making the company as much money as expected. Having an enterprise view of this information can give companies an advantage over their competitors. These companies are ahead of the market concerning specific inventory items that are not selling and which ones are on the rise in popularity. Most products in modern warehouses have a unique SKU attached to them, which identifies their singularity to the rest of the inventory management system.

Many companies have implemented inventory management technology within their operations department to lower overall costs while increasing profit margins and productivity. Companies should consider using numerous inventory management software and systems to achieve these objectives. As previously mentioned, RFID systems are wireless communication systems that incorporate electromagnetic fields to track and identify products with the tags attached. One of the more common forms of RFID technology applications is the "scan guns" that self-checkout systems use and the type used at retail stores like JCPenney or Belk to scan the merchandise purchased. Another common type of RFID system is the supermarket/grocery store scanning systems used at Walmart or Target checkout lines. The supermarket employee scans the bar code of each item over the built-in scanning tray next to the register. RFID scan guns show that the inventory has arrived at the warehouse/store to which it was shipped. Later, the pallet that the product arrived in is scanned and documented as being placed on the floor. Finally, the product is scanned to show that it is shipping to its next destination, often the customer, or purchased at one of the checkout registers. Tracking inventory in this manner is beneficial for many reasons. Outdated, traditional inventory counting methods can be extremely costly to companies. Companies must frequently conduct these counts in retail environments after hours when the store is closed. Additional counts require the company to pay the employees

conducting the inventory count, usually putting the company over payroll limits for that particular week. Typically, some employees are full-time and work beyond the 40-hour workweek, requiring the company to pay overtime. Moreover, many employees are not adequately trained to conduct inventory audits.

The benefits for using RFID systems are many, including having employees spend less time in warehouses or stores looking for missing inventory. With the products being scanned anytime they move from one location to another, operations associates can better track the inventory and trace the steps back to observe where the items were last seen and processed. Additionally, companies that take advantage of RFID systems can experience a decrease in accidental stockouts. With less inventory loss, time spent counting individual pieces of inventory and money spent on unnecessary payroll hours, companies maintain a more accurate database that provides their customers with a better purchasing experience. According to Buttle and Malkan (2019), "Given that customer satisfaction is largely driven by customer experiences in buying and using products, we can conclude that the direct form of CE (buying) is usually a consequence of customer satisfaction."

ASAP Systems is another inventory management system that has proven its worth within the business world. ASAP Systems is an industry-leading barcode inventory system and asset tracking program utilized by companies within different industries worldwide. ASAP Systems has remained an industry leader for many years due to continuous innovation, enhancing company efficiency, and improving the customer experience, which positively drives sales. One of ASAP System's more recent innovations debuted in 2019 when it announced new improvements to its inventory shopping cart module. Like many ASAP Systems programs, the inventory system shopping cart is effective across numerous industries. "The Inventory System

Shopping Cart is a beneficial tool for users within medium to large organizations, including IT companies, Police & Fire Departments, Education, Military and Government Installations" (ASAP Systems, Inc., 2019, p. 2). The inventory shopping cart module allows customers to log in to the company's warehouse, browse the current in-stock inventory, and add various items of a quantity of the customer's choice (given that the requested quantity is in stock) and purchase these items. ASAP Systems' Head of Engineers, Joseph Azzi, claims, "This is just one more tool users have to make inventory management easier and more efficient" (ASAP Systems, Inc., 2019, p. 4). While this type of inventory tracking and management system can be costly, companies can expect a profitable return on their investment when properly implementing the system. Companies possessing an easy-to-use system like this for customers to view and purchase products will increase new customer acquisitions and improve existing customer retention. Satisfied customers will continue to return to the company to purchase the goods or services they need, continually driving sales and profitability.

Exchanging accurate, timely, and relevant information between customers and suppliers is vital for business success. In today's world, where everyone wants information at the click of a search button, quickly exchanging information can make or break a sale for a company. Companies can stay ahead of the curve by implementing EDIs within their supply chain operations. The type of information visible on the customer's end will vary from company to company, as each one will have its unique information sharing policies. For example, Eastman Chemical Company has an EDI system that allows customers to see information that is pertinent to the purchase order, such as the PO Acknowledgement that contains the customer information, supplier address, PO number, Eastman order number, and then the product, the customer material number, and pricing (depending on the specifications). Having pertinent information

ready at a moment's notice can be a substantial competitive advantage over competitors that do not have a competent EDI system in place. It is hard to imagine a large company today that still relies on sending paper forms back and forth with their customers. Implementing EDI will also help companies "develop more effective production and inventory control policies that can bring higher profit and better customer service" (Huang, 2004, p.1).

One overlooked aspect of inventory management is overdependence. Overdependence can propel companies into uncomfortable and desperate situations. For example, many companies in the United States that generally have PPE on hand for employees were forced into a bind when the coronavirus pandemic began in early 2020. Most PPE supplies, including protective face coverings, latex gloves, and other preventative gear for the coronavirus, are manufactured overseas in China and Vietnam. The urgency of the coronavirus spread caused people and companies to "panic buy" PPE gear which left shortages across most manufacturers rather quickly. These shortages compelled customers to wait for their PPE as manufacturers tried to catch up. When partial PPE supply returned, companies paid significantly higher prices than the average rate due to the scarcity of the products and the overwhelming demand for them. Having an effective inventory management policy can help companies maintain multiple suppliers for these products as a safety net if one of the suppliers sells out of the PPE equipment. Companies may also consider manufacturing their own PPE equipment to maintain in their inventory for self-use, avoiding relying on suppliers for these products entirely.

Companies like JCPenney and Guitar Center fall under the categories of both retailer and e-tailer, which comes with its own set of responsibilities that can affect inventory management processes and profitability. "Inventory control and assignment of distribution responsibility each can impact how a retailer/e-tailer handles its online fulfillment" (Mahar 2005, p. 25). For

example, companies that offer online shopping where the purchased products can be sent directly to the customer's house or BOPIS (Buy Online Pickup in Store) services must decide what inventory pool to utilize. Firms could choose to use the inventory available at a particular warehouse, inventory at the brick-and-mortar stores, or both, which is the most common choice. Suppose companies choose to have products sourced from multiple locations. In that case, they must be aware that the overall shipping cost could increase if orders contain items that must ship from multiple locations. Now, these companies could make the customers pay for the shipping by either increasing the price of the items or charging more for shipping. Alternatively, customers could look elsewhere for the products they want. The potential solution lies in an effective inventory management policy. A practical and successful inventory/warehouse management practice can help offset profit loss due to inefficient shipping. Companies with inventory in both brick-and-mortar stores and warehouses should monitor the inventory levels of each to avoid a potential loss via overstocking or stockouts. Atnafu (2018) claims, "Ideally a company wants to have enough inventories to satisfy the demands of its customers with no lost sales due to inventory stockouts. On the other hand, the company does not want to have too much inventory staying on hand because of the cost of carrying inventory." Specific applications relating to effective IM policy include maximizing inventory storage space and equipment use, reducing inventory and related handling costs, and processing customer orders efficiently (Anonymous, 1987).

The coronavirus has been the ultimate test for supply chain and inventory managers worldwide in the last decade. The supply chain's long-term problems are "unpredictable consumer habits now arising due to the effects of various lockdowns and restrictions" (Emerald Publishing Limited, 2021, p. 23). Without being able to predict what consumers will do, supply

chain managers will not be able to manage their inventory at the same level as they have been, which can drive down overall sales and profits. Better communication between companies and the customer base would prove beneficial during trying times like these. It would allow supply chain managers to better understand the customer's priorities and needs. Another means of gaining more accurate consumer data during times like these would be for companies to develop more adaptable demand forecasting software that can better accommodate more uncommon factors that may affect consumer demand.

Conclusion

Profitability is a crucial metric for most businesses. Inventory management plays a prominent role in a company's profitability. It is essential to understand this relationship because proper utilization of inventory management can drastically impact profitability, giving companies a competitive advantage in a world where new competitors emerge every day. Inventory management focuses on having the right items on hand at the right time to meet customer demand while controlling costs and minimizing waste and loss. If appropriately implemented, inventory management is vital for lowering costs, improving profitability, and creating and sustaining a competitive advantage. Proper execution demands firms to utilize the methods provided by both the current and previous research discussed in this thesis. Benefits of an adequately implemented inventory management policy include improved inventory tracking, warehouse/operational efficiency, improved communications, and profitability, among many others. Future research could focus on how inventory management recovered and evolved from the coronavirus pandemic. Future research should also explore the value of improved technology, analytics, personalization, and automation to help companies assess where to invest resources, engage stakeholders, and optimize data use to advance growth and profitability (Jenkins, 2021). The presented research is founded upon previously published studies and applied to real-world scenarios.

References

- Anonymous. (1987). Inventory Management: Controlling Costs to Maximize Profits. *Small Business Report*, 12(8), 50-53.
- ASAP Systems. (2019, July 16). *ASAP Systems, an Inventory System and Asset Tracking Solution provider Continues to Make Inventory Management Easier: ASAP Systems, an Inventory System and Asset Tracking Solution Provider, reacts to what their customers want and enhances its Inventory Shopping Cart to provide a view only option.* [Press release] <https://www.proquest.com/wire-feeds/asap-systems-inventory-system-asset-tracking/docview/2258168260/se-2?accountid=10771>
- Atnafu, D. & Balda, A. (2018). The impact of inventory management practice on firms' competitiveness and organizational performance: Empirical evidence from micro and small enterprises in Ethiopia. *Cogent Business & Management*, 5 (1). <https://doi.org/10.1080/23311975.2018.1503219>
- Cavinato, J. (1990). Managing Different Types Of Inventory. *Chilton's Distribution*, 89(3), 88-92.
- Chang, J. (2022, January 14). *97 supply chain statistics you must know: 2021/2022 market share analysis & data.* Financesonline.com. Retrieved March 25, 2022, from <https://financesonline.com/supply-chain-statistics/>
- Eastman Chemical Company. (2020). *Eastman 200 Annual Report*, https://www.annualreports.com/HostedData/AnnualReports/PDF/NYSE_EMN_2020.pdf
- Edelman, M.P. (1990). Use of the Inventory Turnover Measurement. *Hospital Material Management Quarterly*, 12(1), 50-56.
- Emerald Publishing Limited. (2021). Supply chain resilience: Strategies in response to COVID-19 and its impact on supply chains, *Strategic Direction*, 37(6), 23-24. <https://doi.org/10.1108/SD-04-2021-0041>
- Frost & Sullivan. (2021, November 11). *COVID-19 Impact Analysis on the Personal Protective Equipment (PPE) Supply Chain: The COVID-19 pandemic has permanently changed several aspects of global manufacturing and supply chain ecosystems. One of the most notable changes is in the personal protective equipment (PPE) supply chain,* [Press release] <https://www.proquest.com/wire-feeds/covid-19-impact-analysis-on-personal-protective/docview/2595916104/se-2?accountid=10771>
- Goddard, W. & Melville, S. (2004). "Research Methodology: An Introduction." 2nd edition, Blackwell Publishing.
- Gołaś Z. (2020): Effect of inventory management on profitability: evidence from the Polish food industry: Case study.

- Hayes, A. (2022, March 17). *Inventory management definition*. Investopedia. Retrieved April 9, 2022, from <https://www.investopedia.com/terms/i/inventory-management.asp>
- Herzig, T. L., (1976). *LIFO and FIFO and their effects on profits and cash flow during inflation and deflation* (Publication No. EP36223) [Master's thesis, University of Montana] ProQuest Dissertations Publishing.
- Horton, M. (2021, December 7). *The difference between profitability and profit*. Investopedia. Retrieved April 9, 2022, from <https://www.investopedia.com/ask/answers/012715/what-difference-between-profitability-and-profit.asp>
- Huang, B. (2004). *Optimal Production-Inventory Policies in Supply Chains with Information Sharing* (Publication No. 3132538) [Doctoral dissertation, Northwestern University] ProQuest Dissertations Publishing.
- "Interpretivism (Interpretivist) Research Philosophy." (n.d.) Business Research Methodology. <https://research-methodology.net/research-philosophy/interpretivism/>
- Jenkins, A. (2021). *14 top inventory management trends to know in 2021*. Retrieved March 26, 2022, from <https://www.netsuite.com/portal/resource/articles/inventory-management/inventory-management-trends.shtml>
- Kalivas, N. (2018, February 16). *Indexology Blog*. Indexology Blog SP Dow Jones Indices. Retrieved March 25, 2022, from <https://www.indexologyblog.com/2018/02/16/what-do-inventories-tell-us-about-the-economy/>
- Mahar, S. (2005). *Inventory and distribution strategies for retail/e-tail organizations* (Publication No. 3183918) [Doctoral dissertation, Indiana University] ProQuest Dissertations Publishing.
- Meyers, M.D. (2008) "Qualitative Research in Business and Management." SAGE Publications.
- Palinkas, Lawrence A. et al. "Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Methodology Implementation Research." (November 6, 2013). *Administration and Policy in Mental Health and Mental Health Services Research*, Vol 42, pp. 553-544, <https://link.springer.com/article/10.1007/s10488-013-0528-y>.
- RFID Inventory Systems. (2016, March 31). *RFID Inventory Systems, Inc. Introduces Its Patent Pending Tower Inventory System: TIS Helps Warehouse Owners Realize RFID Efficiencies*, [Press release] <https://www.proquest.com/wire-feeds/rfid-inventory-systems-inc-introduces-patent/docview/1776790829/se-2?accountid=10771>
- Saunders, M., & Thornhill, A. (2012). "Research Methods for Business Students 6th edition, Pearson Education Limited.

Tuovila, A. (2021, July 21). *Average cost method definition*. Investopedia. Retrieved March 23, 2022, from

<https://www.investopedia.com/terms/a/averagecostmethod.asp#:~:text=The%20average%20cost%20method%20assigns,as%20the%20weighted%2Daverage%20method>

Vellequette, L. P. (2019). OVERSTUFFED: Near-record inventories eat dealer profits as floorplan costs surge. *Automotive News*, 93(6879).

Yang, L. (2016). *Optimizing Inventory for Profitability and Order Fulfillment Improvement: Integrating Inventory Classification and Control Decisions under Non-Stationary Demand For Profit Maximization and Integrating Inventory Classification and Control Decisions to Maximize Order Fulfillment Measures* (Publication No. 10116256) [Doctoral dissertation, University of Missouri - Saint Louis] ProQuest Dissertations Publishing.

Appendix

1.1

2. INVENTORIES

(Dollars in millions)	December 31,	
	2020	2019
Finished goods	\$ 891	\$ 1,114
Work in process	203	220
Raw materials and supplies	511	576
Total inventories at FIFO or average cost	1,605	1,910
Less: LIFO reserve	226	248
Total inventories	<u>\$ 1,379</u>	<u>\$ 1,662</u>

Inventories valued on the LIFO method were approximately 50 percent of total inventories at both December 31, 2020 and December 31, 2019. In 2020, a \$13 million LIFO decrement was recognized due to inventory reduction actions, resulting in an increase to "Cost of sales" in the Consolidated Statements of Earnings, Comprehensive Income and Retained Earnings and a decrease to "Inventories" in the Consolidated Statements of Financial Position.