

**THE EFFICIENCY IMPROVEMENT OF RESOURCE MANAGEMENT WITH  
ERP IMPLEMENTATION:  
FINANCE MANAGEMENT PERSPECTIVE  
(STUDY CASE IN INDONESIAN COMPANIES)**

**A THESIS**

Presented as a Partial Fulfillment of the Requirements to obtain Bachelor Degree  
in Accounting Department on Faculty of Economics  
Universitas Islam Indonesia



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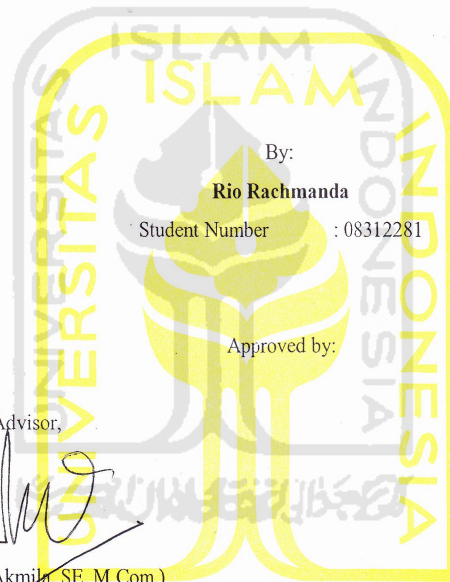
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UNIVERSITAS ISLAM INDONESIA**

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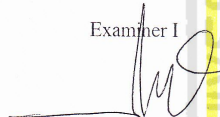
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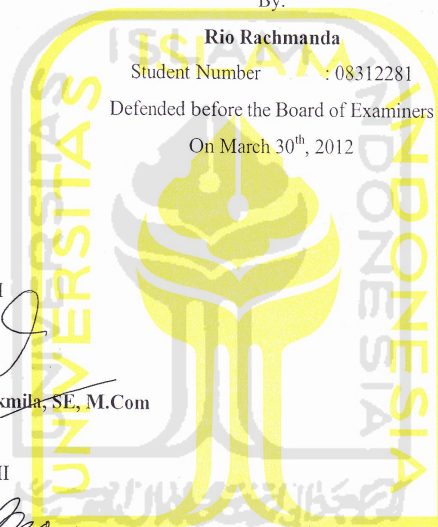


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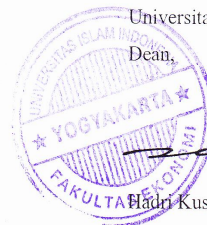
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## DECLARATION OF AUTHENTICITY

Herein I declare the originality of this thesis, I have not presented anyone's work to obtain my university degree, nor have I presented anyone else's words, ideas or expression without acknowledgement. All quotations are cited and listed in the references of the thesis.

If in the future this statement is proven to be false, I am willing to accept any sanction complying with the determined regulation or its consequence.

Yogyakarta, March 30<sup>th</sup>, 2012

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## TABLE OF CONTENTS

Title Page .....	i
Approval Page .....	ii
Legalization Page .....	iii
Declaration of Authenticity .....	iv
Acknowledgement .....	v
Table of Contents .....	vi
List of Figures .....	xii
List of Appendices .....	xiii
Abstract (in English) .....	xv
Abstract (in Bahasa Indonesia) .....	xvi

## CHAPTER I INTRODUCTION

1.1 Study Background .....	1
1.2 Problem Formulation .....	4
1.3 Problem Limitation .....	5
1.4 Research Objectives .....	5



1.5	Research Contribution .....	6
1.6	Systematic Writing .....	7

**CHAPTER II REVIEW OF RELATED LITELATURE**

2.1	Enterprise Resource Planning (ERP) .....	8
2.2	SAP .....	10
2.3	The History and Development of SAP in Indonesia .....	12
2.4	Resource Management (Asset and Fund Management).....	13
2.4.1	How to make efficiency in the use of asset and fund .....	14
2.4.1.1	Receivable Turnover .....	14
2.4.1.2	Inventory Turnover Ratio.....	14
2.4.1.3	Total Asset Turnover.....	14
2.5	Company's Performance.....	15
2.5.1	Definition of Performance.....	15
2.5.2	Financial Performance.....	16
2.5.3	The Effect of ERP Implementation on Company's Financial Performance.....	17
2.6	Existing Prior Studies.....	18
2.7	Hypotheses Formulation .....	19

2.7.1	Asset Management.....	19
2.7.2	Fund Management.....	20
2.8	Logical Model .....	21

**CHAPTER III RESEARCH MODEL**

3.1	Data Sample .....	22
3.2	Sample Data Type .....	24
3.3	Data Collecting Method .....	25
3.4	Research Design .....	25
3.4.1	Definition of Indicator .....	26
3.4.1.1	Inventory Turnover Rate (WGTO).....	26
3.4.1.2	Accounts Receivable Turnover (ARTO).....	27
3.4.1.3	Fixed Asset Turnover Ratio (FATO).....	29
3.4.1.4	Total Asset Turnover Ratio (TATO).....	30
3.4.2	Efficiency Ratio.....	30
3.5	Research Model .....	32
3.6	Statistical Test.....	34
3.6.1	Descriptive Statistic Test.....	35

3.6.2	One Sample t-Test .....	35
3.6.3	Student t-Test.....	36
3.6.4	Goodness of Fit Test... ..	39
3.7	Research Framework .....	41
3.8	Research Constraint.....	42

**CHAPTER IV RESEARCH FINDING AND DISCUSSION**

4.1	Description .....	43
4.2	Research Findings .....	47
4.3	The Result of Hypothesis Testing.....	50

**CHAPTER V CONCUSSION AND RECOMMENDATIONS**

5.1	Conclusions .....	55
5.2	Limitations .....	57
5.3	Recommendations.....	57

<b>REFERENCES .....</b>	<b>59</b>
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<b>APPENDICES .....</b>	<b>66</b>
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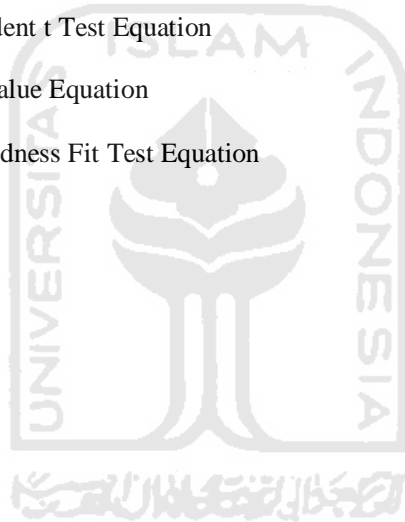
## LIST OF FIGURES

1. Figure 2.1 Research Model
2. Figure 3.1 Student t Distribution
3. Figure 3.2 Research Framework Map
4. Table 3.1 Independents Effect on Dependent Variable
5. Table 3.2 Variables
6. Table 4.1 Sample Selection Procedure
7. Table 4.2 Data of Company SAP Implementation Year
8. Table 4.3 Description of Financial Ratio with no ERP Implementation
9. Table 4.4 Description of Financial Ratio with ERP Implementation
10. Table 4.5 Regression Result
11. Table 4.6 The Effect of ERP implementation.
12. Table 4.7 Result of Hypothesis Testing

## LIST OF EQUATION

1. Equation 3.1 Inventory Turnover Rate Equation
2. Equation 3.2 Average Inventory Equation
3. Equation 3.3 Average Inventory Turnover per days Equation
4. Equation 3.4 Account Receivable Turnover Equation
5. Equation 3.5 Average Account Receivable Equation
6. Equation 3.6 Realization Average Account Receivable Equation

7. Equation 3.7 Fix Asset Turnover Ratio Equation
8. Equation 3.8 Total Asset Turnover Ratio Equation
9. Equation 3.9 Current Ratio Equation
10. Equation 3.10 Acid Ratio Equation
11. Equation 3.11 Liquity Equation
12. Equation 3.12 Multiple Liner Regression
13. Equation 3.13 Modified Equation of Equation 3.12
14. Equation 3.14 One Sample t Test Equation
15. Equation 3.15 Student t Test Equation
16. Equation 3.16 T Value Equation
17. Equation 3.17 Goodness Fit Test Equation



## LIST OF APPENDICES

1. Appendix 1 Raw Data
2. Appendix 2 Variable Data
3. Appendix 3 Sample Description
4. Appendix 4 One Sample t Test Data t-3 to t-1
5. Appendix 5 Test Result No ERP
6. Appendix 6 Test Result With ERP
7. Appendix 7 Regression Result
8. Appendix 8 Reg Data



## ABSTRACT

Recently, the competition among businesses is getting more intense. Consequently, companies are seeking to increase their capability in terms of company's ability to manage resources into the use of funds and assets, a significant upgrade at the same time to have an impact on the company's performance. Moreover, ERP systems have become the most popular system for the majority of publicly traded companies and have answer the demand from many companies to increase their resource management capability. In this research the researcher examine the improvement of resource management as the result of ERP implementation. The data in this research are from 26 sample firms, which listed in Indonesian capital market directory, after implement Enterprise Resource Planning (ERP) program

The result of this research stated that the implementation of ERP in the asset management efficiency has significant advantages, comparative with non-implementation of ERP systems because the element of asset management (inventory turnover ratio, fix asset ratio and total asset ratio) are getting increase. Then the second result is the implementation of ERP systems in the fund management efficiency has significant advantages, comparative with non-implementation of ERP systems because the elements of fund management (acid ratio and liquid asset improvement) are getting increase.

**Key Word: ERP, Resource management, Asset Management, Fund Management**

## ABSTRAKSI

Saat ini, persaingan diantara perusahaan semakin intens. Akibatnya, perusahaan mencari cara untuk meningkatkan kemampuan perusahaan dalam hal pengelolaan sumber daya ke dalam penggunaan dana dan aset, peningkatan perbaikan yang signifikan pada saat yang sama memiliki dampak pada kinerja perusahaan. Selain itu, sistem ERP telah menjadi sistem yang paling populer untuk sebagian besar perusahaan publik dan telah menjawab permintaan dari banyak perusahaan yang ingin meningkatkan kemampuan sumber daya manajemen mereka. Dalam penelitian ini peneliti meneliti peningkatan manajemen sumber daya sebagai hasil dari implementasi ERP. Data dalam penelitian ini berasal dari 26 perusahaan sampel, yang terdaftar dalam direktori pasar modal Indonesia, setelah menerapkan Enterprise Resource Planning (ERP) program.

Hasil penelitian ini menyatakan bahwa implementasi ERP dalam efisiensi manajemen aset memiliki keuntungan yang signifikan, komparatif dengan non-implementasi sistem ERP karena unsur manajemen aset (persediaan rasio turnover, rasio aset tetap dan rasio total aset) semakin meningkat. Kemudian hasil kedua adalah implementasi sistem ERP dalam efisiensi pengelolaan dana memiliki keuntungan yang signifikan, komparatif dengan non-implementasi sistem ERP karena unsur pengelolaan dana (asam dan peningkatan rasio aktiva likuid) semakin meningkat.

**Key Word: ERP, Resource management, Asset Management, Fund Management**



## CHAPTER 1

### INTRODUCTION

#### 1.1 Background Study

Recently, the competition among businesses is getting more intense. Consequently, companies are seeking to increase their capability in terms of company's ability to manage resources into the use of funds and assets, a significant upgrade at the same time to have an impact on the company's performance.

Enterprise Resource Planning (ERP) system is one aspect of the nature of the resource management system, ERP system itself, "born" as a material resource planning systems (MRP). ERP system is a company application of resources to control a model or method. This model is the company's existing management culture, management processes and management goals, therefore each enterprise application ERP system can also be seen as the company's ability to manage resources. As a result, the reason is to implement of ERP systems and application is to enhance the company's resource management capabilities and to help companies gain a competitive advantage.

Most ERP software implemented by companies worldwide are provided by the top five application vendor packages, they are SAP,

PeopleSoft, Oracle, Baan, and J.D. Edwards (Poston and Grabski, 2001). Among those five-largest ERP software vendors, SAP is currently leading the market of ERP software (Gartner, 2005)

The continuing trend to implement SAP within a company is because it offers several advantages. One main advantage is to reduce redundancy inconsistency in data through the creation and maintenance of a central database of corporate information (Poston and Grabski, 2001). With ERP software provided by SAP, errors could be reduced and employees have access to current information for decision-making.

ERP systems are also expected to reduce labor costs, bureaucracy, and errors (Poston and Grabski, 2001) since its architecture can facilitates integration across different applications (i.e., information sharing across business processes) supporting concurrent and automatic updates, without the need for manual intervention (Poston and Grabski, 2001). Given the advantages of ERP features provided by SAP, companies which are implementing it should experience an overall reduction in cost and a general improvement in decision-making activities.

ERP enterprise resource and its relationship can be expressed as the relationship between ERP and enterprise resource. For example, factories, production lines, processing equipment, testing equipment, transport equipment that should be integrated with the enterprise resource software along with the companies structure such as hardware resources,

manpower, management, credit, financing capability, organizational structure, staff work. ERP system is the object of the management of these resources and factors of production through the use of software. As a result the production process is in a timely manner, the completion of the high quality of customer orders, serve to maximize the role of the resources, and in accordance with customer orders and production state of resources to adjust the decision-making process.

The efficiency of resource-based competitive strategies of the main content can be used as the main way of the company management to use existing resources for obtaining a competitive advantage and maintaining the advantage. Therefore, in this research the researcher has some hypotheses about resource management after the ERP implementation. In this research, the researcher intends to investigate more about asset and fund management which are included as part of resource management. Therefore, the hypotheses proposed are the adoption of ERP has a significant advantages concern to asset and fund management, despite the fact that the company has not adopted ERP systems.

This research is the replication from previous research that is made by Zhang and Wang (2004). The difference between this research and the previous research is that the previous research used public listed company in China, however in this research use the Indonesian public companies listed in BEI. Moreover this research the researcher wants to investigate the significant advantages on the asset and fund management

(management resources) after implementation of ERP. Finally, the researcher wants to propose the thesis entitled **“The Efficiency Improvement of Resource Management with ERP Implementation: Finance Management Perspective”**.

## **1.2 Problem Formulation**

In this research the researcher will examine especially the advantages in resource management (asset and fund management) in companies after the ERP implementation. Furthermore, the researcher suggests hypothesis that needs to be figure out, “for the companies that implement ERP could obtained significant advantages on their resource management, comparative with non-implementing companies”. Moreover, the researcher also wants to investigate the companies that do not apply the ERP systems especially in the resource management impact. Thus, the problems are formulated as follows:

1. Does the implementation of ERP systems have significant advantages in their asset management efficiency, compared with companies that do not implement ERP?
2. Does the implementation of ERP systems create significant competitive advantages in their fund management efficiency, compared with companies that do not implement ERP?

### **1.3 Problem Limitation**

Limitation of the research area is required, in order that this research can more focus on particular discussions. Here are the research area limitations:

1. The Asset management efficiency indicators: inventory turnover rate (WGTO), accounts receivable turnover (ARTO), fixed asset turnover ratio (FATR), and total asset turnover ratio (TATO).
2. General selected Fund management efficiency indicators: the flow rate (LIQUITY) and acid ratio (ACRATIO).

### **1.4 Research Objectives**

There are four objectives to be achieved by this study:

1. To investigate the effect of ERP implementation in the company, if it does have significant advantages toward the asset management.
2. To investigate the effect of ERP implementation in the company, if it does have significant competitive advantages toward the fund management?

### **1.5 Research Contribution**

This research is conducted with the hope that it can make a contribution to the area of scientific research, particularly in Accounting

area as well as to subsequent studies. The result of this research is expected to benefit these following parties:

1. Researcher

This researcher can implement and apply the knowledge obtained in the university study course as well as finish one of the requirements to obtain the bachelor degree in Economics Faculty (major in Accounting) at Universitas Islam Indonesia.

2. Academic

This study can be as a contribution to accounting study, especially resource management, financial management competitiveness and other discipline in academic library. In addition, it can be taken into consideration for next studies.

3. Companies

For companies, this research can be a valuable input for their managements in making decision for their business.

4. Other Parties

This research is expected to be a reliable source of information or reference in regard to similar or related research tasks in the future for students, lecturers, or those who intend to explore more about ERP implementation.

## 1.6 Systematic Writing

This research report consists of five chapters which each chapters in which each discusses and elaborates different topic. The first chapter is an introduction chapter that discusses the study background, problem identification and problem formulation, research objectives, limitation, contribution, and systematic writing.

The related literature is presented in chapter two - ERP, SAP, resource management which include asset management and fund management.. This chapter also explains existing prior studies in brief and also the hypothesis formulation.

The third chapter presents the detail of research method used in this research. It covers the information of population and sample, types of data, data collecting method, research variable, and also data analysis method.

All the processes to elevate the data are discussed in the fourth chapter. This chapter also presents the result of hypothesis testing along with the data analysis.

The last chapter discusses the conclusion based on the data analysis. The recommendations from the researcher for parties concerned with the research and possible future research are also presented here.

## **CHAPTER II**

### **REVIEW OF RELATED LITERATURE**

In this chapter the researcher will continue the discussion through analyzing the review of related literature. This chapter will present related literatures which explain about ERP, SAP, the influence of SAP implementation within the financial performance, and another explanation which is related to the topic of this study. Any existing prior studies as well as the hypothesis formulation are also included in this chapter.

#### **2.1 ERP**

The Enterprise Resources Planning (ERP) technology provided by SAP can integrate all functions in a company such as, marketing, production, logistic, finance, resources, etc. ERP is specifically developed as a tool of integration in order to integrate all company's applications into a core database which is accessible for any party who need the information. The data integration in ERP technology is executed by single data entry, which means that if one department enter the data, then this data can be utilized by the other departments within the company (Tarigan, 2006).

ERP is a way to manage company's resources by utilizing the information technology. The use of ERP complemented with the hardware and software are employed in order to coordinate and integrate the data



information on each of business processes area to produce a quick decision-making because the ERP system can provide financial analysis and statement quickly, timely sales report, as well as production and inventory report (Tarigan, 2006). Enterprise resource planning (ERP) systems integrate internal and external management information across an entire organization, embracing finance/accounting, manufacturing, sales and service, customer relationship management, etc. ERP systems automate this activity with an integrated software application. Its' purpose is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections to outside stakeholders (Bidgolli, Hossein, 2004).

Most ERP software available on the market (i.e., from vendors like J.D. Edwards, Baan, Oracle, PeopleSoft, and SAP) is structured into different modules. Typical modules include accounting, human resources, manufacturing, and logistics. Each module is business process-specific, accesses a core/shared database, and can be considered a single application from both a user interface and software structure point of view. This structure enables users to develop module-specific competencies and vendors to swiftly modify software structure with new release updates (Rizzi and Zamboni, 1999). One of the major features of ERP software is the integration between modules, data storing/retrieving processes, and management and analysis functionalities (Davenport, 1998; Hoffman, 1998). ERP provides the same functionalities of previous stand-alone

systems while allowing access to enterprise-wide information by employees throughout the entire company on a controlled basis.

## 2.2 SAP

The name for SAP which is originally from *German: Systeme, Anwendungen, Produkte*, German for "Systems Applications and Products." The main idea of SAP was to provide customers with the ability to interact with a common corporate database for a comprehensive range of applications. Recently, the applications have been assembled and today many corporations, including IBM and Microsoft are using SAP products to run their own businesses (SAP Global, 2009).

SAP applications, built around their latest R/3 system, provide the capability to manage financial, asset, and cost accounting, production operations and materials, personnel, plants, and archived documents. According to the report of Software Top 100 (2009), SAP is the largest software enterprise in Europe and the fourth largest software enterprise in the world. Many customers of SAP have reported the perceived advantages from implementing it. One of the advantages is that the company implementing SAP can perceive an efficiency and effectiveness within its internal operation (SAP Global, 2009).

The vision of SAP is to develop and market standard enterprise software which would integrate all business processes. The second part of their vision was that the data should be processed interactively in real time.

(SAP Global, 2009). SAP is software of Enterprise Resource Planning or an IT tools created or designed by the management with the objective or the purpose of assisting the company to plan and conduct its daily activities.

In order to fulfill the needs of the customer (user), SAP did not create their Enterprise Resource Planning (ERP) software directly to become the finished product and release it to the market. However, they make the software of ERP systematically step by step through the research and the development which is happened in the process in creating of this product.

The objectives of SAP itself, SAP is willing to become the greatest enterprise software which is user friendly, have the effectiveness and efficiency, and also it can suits for any condition of the company which implement SAP software. ERP which as a tool of SAP software is a software that integrating all of the applications needed by the company, starting from finance, controlling, purchase, distribution, and so forth, in a server called SAP ERP 6.0 (its predecessor widely-known as R/3). Before the latest version of SAP ERP 6.0 generation, it had been through the phase of R/1, R/2, and R/3 (SAP Global, 2009). SAP can be considered as the biggest ERP vendor since its revenue is far higher compared to its other rivals such as Oracle or Microsoft (Gartner, 2005).

SAP can be considered the market of ERP software since they are the first company which established a software integrating all of the

operational functions within a company, and it makes SAP become the fourth largest software of enterprise system in the world. Although there are some advantages after the implementation of SAP, there are also some disadvantages for implementing SAP software. The company that applies SAP will have higher cost regarding the price that the company should pay for, and also the company should pay the cost of SAP consultant. And it is considered additional cost quite expensive price (Gartner, 2005). Thus, most of Indonesia's companies still do not want to implement SAP and still are not familiar with the usefulness of the SAP itself.

### **2.3 The History and the Development of SAP in Indonesia**

SAP emerged in Indonesia was in 1995 that was led by Krish Datta through the significant growth of SAP in Singapore. Krish Datta is the managing director appointed to infiltrate the market in Indonesia. However, PT. SAP Indonesia was officially established in 1997. Recently, the customers (users) have reached in more than 32.000 customers around the world in more than 120 countries and not less than 84.000 installation of software provided by SAP (Wulandari, 2006).

SAP recently has many users; there are some various reputable companies in Indonesia which have adopted SAP such as Pertamina, Telkomsel, Holcim Indonesia, Indosat, Astra Honda Motor, Timah, and Metrodata. For products, SAP also provides various products for various sizes of the companies, for instance SAP Business One (SBO) is widely

used by small to mid-size companies while SAP ERP 6.0 or SAP R/3 are generally used by big-scale companies (Reinandang, 2007).

SAP also began to enter in University academic system throughout SAP University Alliance Program. Recently, PT. SAP Indonesia cooperates with some Universities in Indonesia. The well-known public Universities in Indonesia such as Universitas Gadjah Mada, Universitas Indonesia, Institut Teknologi Bandung, and Institut Pertanian Bogor. There are also some Universities which had cooperated with SAP before such as Universitas Islam Indonesia, Universitas Bina Nusantara, Universitas Ciputra. Thus, total of Universities which have joined SAP University Alliance Program in Indonesia are 10 Universities.

It is believed that SAP is one of many ERP developers that used by major companies in Indonesia because this software is popular among the companies in terms of the efficiency to reunite the separated information systems. It is also believed that the companies which have not implemented SAP usually makes their information systems such as supply management, customer relationship management, product lifecycle management, and supplier relationship management (Wulandari, 2006).

#### **2.4 Resource Management (Asset and Fund management)**

Resource management is the process of using a company's resources as efficient as possible. These resources can include tangible resources such as goods and equipment, financial resources, and labor resources such

as employees. Resource management can also mean ideas of making sure one has enough physical resources for one's business. Moreover it tries to make sure that people are assigned to do their work, keep them busy and can save the time.

## **2.4.1 How to make efficiency in the use of asset and fund**

### **2.4.1.1 Receivables Turnover**

Receivables turnover is a ratio that works hand in hand with average collection period to give the business owner a complete picture of the state of the accounts receivable. Receivables turnover looks at how fast we collect sales or, on average, how many times the company clean up yearly or collect their total accounts receivable.

### **2.4.1.2 Inventory Turnover Ratio**

The inventory turnover ratio is one of the most important asset management or asset turnover ratios. If your firm sales physical products, almost no ratio is more important.

### **2.4.1.3 Total Asset Turnover**

The total asset turnover ratio is the asset management ratio that is the summary ratio for all asset management ratios exist in this thesis. If there is a problem with inventory, receivables, working capital, or fixed assets, it will shows in the total asset turnover ratio. The total asset turnover ratio

shows how efficiently your assets generate sales. The higher the total asset turnover ratio, the better and the more efficient asset base to generate sales.

## **2.5 Company's Performance**

Helfert (1993) cited in Fatimah (2005) stated that the company's performance is a result or consequences of continuous decision-making process done by the management which is carried out in the field of investment, operational, and fund.

### **2.5.1 Definition of Performance**

Many literatures have discussed the definition of performance. Among them is Daft (2004) that defines performance as the ability of an organization in achieving its objectives through utilizing the resources efficiently and effectively (Aulia, 2008). In this statement, the definition of performance emphasizes on the responsibility of the management as a whole or even of a certain department or division. Meanwhile Irianto (2001) in Fatimah (2005) stated that performance is an accomplishment achieved by a company, which reflects the health indicator of a company in a certain period of time. According to Daft (2004), the effectiveness of an organization is the degree of how the organization managed to achieve the settled objectives (see: Aulia, 2008). Still discussed by Daft (2004) in Aulia (2008), the efficiency of an organization is related to the number of resources within an organization. Efficiency could be measured on how

many raw materials, money, and people needed to generate a certain volume of output with a certain technology.

### **2.5.2 Financial performances**

Company's performance can be assessed through financial statement. Based on the data in financial statement published by a company we can calculate the financial ratio as an assessment of company's performance. Financial performance becomes the focus of company's analysis since financial performance could describe the company's actual condition. Moreover, financial performance has a strong relationship with the other aspects of strategy (Fatimah, 2005).

Generally, financial performance could describe the capability of the management in achieving its objectives. As Harahap (2004) stated in Aulia (2008), financial statement analysis is particularly needed in assessing the financial performance of a company. The word "analysis" implies that one has to identify some units into the smallest part of the units. On the other hand, financial statement generally consists of balance sheet, income statement (profit or loss statement), and cash flow statement. Thus, financial statement analysis can be depicted as identifying the financial statement's items into the smallest unit of information then observing the significant relationship between them, for both of the qualitative data and the quantitative data (Harahap, 2004; cited in Aulia, 2008). Financial statement analysis is carried out in order to comprehend the financial condition of the company to support the process of decision-making. In



assessing the company's financial performance, the researcher will identify what financial statement categories affected by the implementation of ERP

### **2.5.3 The Effect of ERP Implementation on Company's Financial Performance**

Some literatures provide ambiguity in predicting the impact of information systems technology on company's performance (Bharadwaj et al., 2000; cited in Poston and Grabski, 2001). Meanwhile many studies found technology can be associated with the decreasing in worker productivity (Strassman, 1997), and the other evidences can provide positive results of a productivity return. Specifically, the technology coordination cost literature suggests that information systems are expected to contribute in company's economizing by (Poston and Grabski, 2001):

1. Increasing scale of efficiencies of firm operations.
2. Processing business transactions effectively.
3. Collecting and distributing timely information for decision-making.
4. Monitoring and recording employee performance effectively.
5. Maintaining records of business functions within the organization or maintaining communication channels with lower cost.

In later paragraphs the researcher will provide the explanation on how an ERP system provided by SAP affects internal firm operations by

applying economic and industrial organization theories in order to give a better understanding in the relationship.

## **2.6 Existing Prior Studies**

This research is a replication of the previous research. Conducted by Jidong Zhang and Liyan Wang (2004) “The Efficiency of Resource Management with ERP Implementation: Finance Management Perspective”. Their research proposed a hypothesis that the implementations of ERP systems in the asset management efficiency and fund management efficiency have significant advantages, comparative with non-implementation of ERP systems. The implementation of ERP systems has a significant impact on the company's efficiency in resource management to enhance performance. Therefore, ERP system implementation will be the company's ability to manage resources, a significant upgrade at the same time to have an impact on the company's performance. In this paper, the ability of the company's resources in making use of funds and assets, using the current ratio, acid ratio, total asset turnover, inventory turnover, accounts receivable turnover rate and the fixed asset turnover ratio serves as the indicator to measure the efficiency and effectiveness of fund asset management.

As this research is a replication from study, there are definitely some differences between this research and previous one. The previous research take their sample in China stock exchange of the Shanghai and Shenzhen

public listed companies. This research takes advantage of Indonesia's companies as its object.

## **2.7 Hypothesis Formulation**

### **2.7.1 Asset Management**

ERP system itself comes from the MRP system, the core functions from the enterprises of the existing control and the integration and use of resources. ERP as a very important technology investment projects in the academic literature and practice their enterprises to enhance efficiency as an important aspect (Akkermans et al 1999, Davenport 1998). ERP systems have been able to raise the company's performance. It is also to replace the one hand, a lot of complex and often manual process of, and the standardization of the processes, collaboration and automation. For example, process orders, customer response time and speed in such areas as logistics are improving (Cotteleer, 2002; McAfee, 2002).

Comprehensive analysis on the implementation of ERP systems for the company's resources is to help improve management efficiency. It is reflected in the assets and funds management efficiency. As a result, in this research Zhang and Wang (2004) stated that the implementation of ERP systems in the asset management efficiency has significant advantages, comparative with non implementation of ERP systems.

Furthermore, based on the theory above, the hypothesis of Zhang and Wang (2004) is employed. However, the hypothesis has to be tested and proved for Indonesia's companies as the object of the research.

Therefore, the first hypothesis to be tested is:

**H<sub>1</sub>: the implementation of ERP systems in the asset management efficiency has significant advantages, compare to non implementation of ERP systems.**

### **2.7.2 Fund Management**

Business efficiency through the normally measured by the ratio of working capital and evaluation, the ratio of sales to the general revenue or cost of sales for the elements to a particular asset subject to constitute the denominator, the ratio of analysis is also an important type of rate of one common The turnover rate of two types: the use of capital efficiency and asset efficiency.

General enterprises can be divided into human resources, finance, and materials, and in our analysis of the efficiency of the enterprise, only fiscal inspection and the matter of efficiency: that is, the efficiency of the use of funds and assets of efficiency (Zhang and Wang, 2004).

Moreover Zhang and Wang (2004) conclude that, for the firms which implementing the ERP system also has the significant advantages in the efficiency use of funds. Furthermore, Zhang and Wang (2004) stated that the implementation of ERP systems in the fund management efficiency has

significant advantages, comparative with non implementation of ERP systems.

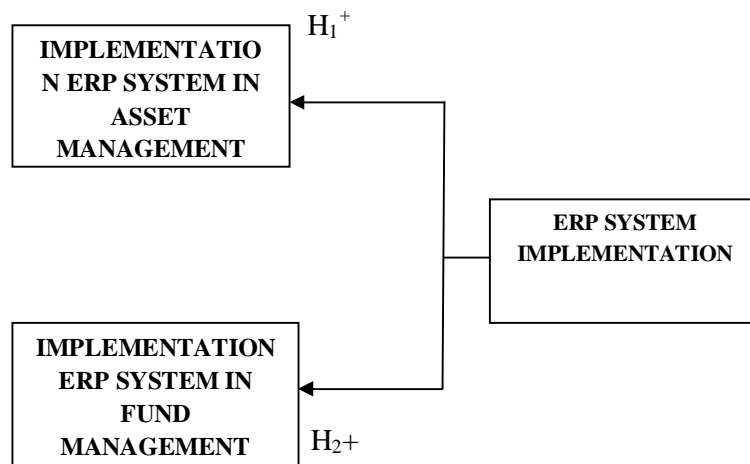
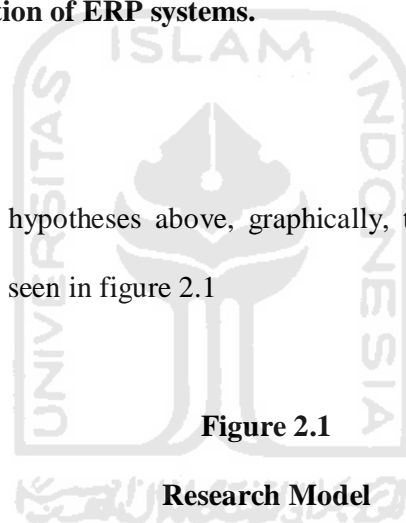
Based on Zhang and Wang (2004), this second hypothesis is employed for Indonesia's companies as the object of the research.

Based on theory above, the researcher has the second hypothesis:

**H<sub>2</sub>: the implementation of ERP systems in the fund management efficiency has significant advantages, compare to non-implementation of ERP systems.**

## 2.8 Logical Model

Based on hypotheses above, graphically, that hypotheses can be drawn like can be seen in figure 2.1



## Chapter III

### RESEARCH METHOD

ERP is a system, and it must include the capability to integrate with the overall system within company or organization. Integration effect of ERP consists of four folds (Zhang and Wang, 2004). *First*, reduce inventory. Including raw materials, work in process and finished goods inventory. Stock funds, such as lower occupancy, increase the number of cash-flow stocks, to reduce inventory errors (1% -2%). *Second*, rational use of resources, to shorten the production cycle and improves productivity. Such as reducing the size of production sites, reducing overtime working hours, reducing the shortage of parts, increasing productivity. *Third*, delivered on time and improve customer service quality. General deliveries on time performance rate of 90%, close to 100%. *Fourth*, reduces costs. Such as lowering costs and reduce overtime. Due to shorten the production cycle, reduce inventory and reduce costs, to increase profits (5% -10%).

Indicators for the integration effect in this research consist of inventory turnover rate (WGTO), accounts receivable turnover (ARTO), fixed asset turnover ratio (FATO) and total asset turnover ratio (TATO).

#### 3.1 Data Sample

Collecting data is as important as analyzing the data (Wonnacott, and Wonnacott, 1985). First the definition of Sample is collection of object or people

which is drawn from a certain population. Population is total collection of object or people with a certain criteria where the sample is drawn (*ibid*, p. 154).

Second, the data sample is selected with *purposive sampling* criteria, which inherently requires an explicit definition of the kinds of data sources that are of interest. In essence, determining which data sources met the goal of purposive sampling for this study is equivalent to defining a set of eligibility requirements for the population (Morgan, 2008). This stage is creating a sampling frame.

In this research the data sample is drawn from companies in Indonesia which are registered in Indonesian Stock Exchange (IDX). The criteria consist of:

1. The public companies listed in Indonesian Stock Exchange and have implemented ERP for minimum of 3 years.
2. ERP implementation within the public companies should finish before December 31st, 2010.
3. The public companies listed in Indonesian Stock Exchange actively published their annual financial statement during the research period (1, 2, 3 years before and 1, 2, and 3 years after SAP implementation).
4. The annual financial statements per December 31st are available for each public companies in 1, 2, 3 year before and 1, 2, and 3 years after ERP implementation.

The samples are collected from 2000-2010. All are Indonesian companies which are listed in Indonesian Capital Market Directory with criteria as mention

above. Time interval is from 2000-2010 because the companies are implementing ERP is not in the same year. Model in the test sample must have 7 years, that is three years before ERP takes place year ( $t-3$  to  $t-1$ ) and three years after ERP is implemented ( $t+1$  to  $t+3$ ) and the year when the ERP is implemented ( $t_0$ ).

### **3.2. Sample Data Type**

The data is gathered from secondary data, which is registered in Indonesia Capital Market Directory published by Indonesian Stock Exchange. Secondary data is data collected by someone else, such as the government and private organizations (Gujarati, 2004 p. 337). There are many forms of secondary data, including transcripts in; journals, magazines and other printed publications, field notes, conversational and visual data, whether photographs, film, or observations of internet occurrences. Simply these data create “trusting process” (Hoonard, and Hoonard, 2008).

The secondary data is collected with certain kinds of criteria. *First*, List of public companies which have finished implementing SAP. *Second*, Annual financial statements and Indonesian Capital Market Directory published by Indonesia Stock Exchange from the public companies listed in Indonesia Stock Exchange for the period of 1, 2, 3 year before and 1, 2, 3 years after SAP implementation.

Quantitative data type is implemented in analyzing the phenomena to yield qualified conclusions. The term quantitative research refers to approaches to empirical inquiry that collect, analyze, and display data in numerical rather than



narrative form. The qualitative–quantitative distinction, however, can be a bit misleading (Donmoyer, 2008).

### **3.3 Data Collecting Method**

The data is collected from Indonesian Capital Market Directory, which is published by IDX. IDX outlet is available on Indonesia Stock Exchange corner in Economics Faculty of Universitas Islam Indonesia, where the data is sold. In annual reports of each company consist of first: the companies' annual finance and second: the company's profiles.

Additional information is gathered in two ways. *First*, interview with ERP education officers in IDX outlet and in Economic Faculty of Universitas Islam Indonesia. The data is not structured yet, but it is enough to enrich the information. *Second*, observing of internet occurrences.

### **3.4. Research Design**

According to Zang and Wang (2004), the asset management efficiency indicators cover inventory turnover rate (WGTO), accounts receivable turnover (ARTO), fixed asset turnover ratio (FATO) and total asset turnover ratio (TATO). These indicators are selected for discovering the operational efficiency of the company.

In order to make these indicators lead to proper conclusion, the definitions of each indicators are needed. This part will try to explain the indicators which are implemented in this research.

### 3.4.1 Definition of Indicators

#### 3.4.1.1. Inventory Turnover Rate (WGTO)

Inventory turnover rate (WGTO) is the cost of product sales and inventory ratio. Mathematically the formulation can be written as:

#### Equation 3.1 Inventory Turnover Rate Equation

$$WGTO = \frac{\text{Cost of Product Sales (CPS)}}{\text{Average Inventory (INV)}}$$

Which:

(INV) = (beginning inventories (BINV+ inventory at the end (EINV)) is divided by 2.

#### Equation 3.2 Average Inventory Equation

$$(INV) = \frac{BINV + EINV}{2}$$

For a certain period of time to measure assets, inventory turnover rate, it is reflected from the purchase of business, production, marketing efficiency. Equation 3.1 is scaled in inventory to reduce large number for regression purpose.

Criterion for WGTO is faster inventory turnover rate, the value of the loss of relatively lower risk. In other words the bigger WGTO the lower risk the companies have. The inventory turnover rate can also be used to indicate the number of days. The formula is as follows: The average inventory turnover per

days = average inventory days x365 / cost of sales. In mathematical term, it is written as:

**Equation 3.3**  
**Average Inventory Turnover per days Equation**

$$\text{average inventory turnover per days} = \frac{\text{inventory}}{\text{cost of sales}}$$

Under normal circumstances, the rate of inventory turnover is the sooner the better. The faster the turnover on the ability of companies to control inventory, the better, capital investment; On the other hand, the slower the pace of inventory turnover, showed that business inventories not only need more funds but also a lot of pressure.

This phenomenon will impact on mobility of assets, and increase the cost of storage, and probably can lead to loss of some product or out of date, resulting in waste (Coase, 1937).

**3.4.1.2 Accounts Receivable Turnover (ARTO)**

Accounts receivable turnover, also known as accounts receivable turnover value of corporate sales and accounts receivable balance of the average ratio is the evaluation of enterprise efficiency and management efficiency. This important indicator is formulated as:

**Equation 3.4**  
**Account Receivable Turnover Equation**

$$ARTO = \frac{\text{Sales}}{\text{average of accounts receivable (AAR)}} \times 100\%$$

which: The average accounts receivable (AAR)= (accounts receivable at the end (AARE)+ the opening of accounts receivable(AARO)) / 2. Mathematically it is written as:

**Equation 3.5**  
**Average Account Receivable Equation**

$$AAR = \frac{AARE + AARO}{2}$$

Account receivable indicator is used under the assumption that sales do not occur through cash, so sales and accounts receivable ratio will be able to detect high and low efficiency. To obtain receivable turnover rate, it is calculated the accounts receivable working capital needs of each of the number of days. The formula is:

**Equation 3.6**  
**Realization Average Account Receivable Equation**

$$\text{realization AAR} = \frac{365}{\text{number of revolving accounts receivable}}$$

Criteria of Accounts Receivable turnover rate, shows that the sooner the business accounts receivable that is the bigger realization of AAR (the dominator in equation 3.5 is bigger), the higher the efficiency of enterprises. On the other hand, the smaller (the dominator in equation 3.5 is smaller) realization of AAR, accounts receivable realized is slower and inefficient management (Barney, 1986).

### 3.4.1.3 Fixed Asset Turnover Ratio (FATO)

Fixed asset turnover ratio (FATO) of fixed asset turnover ratio refers to the business and sales of fixed assets ratio. The formula is: Fixed asset turnover ratio (FATO) = sales / average of fixed assets (AFA). To simplify the formula, mathematically it is written as:

**Equation 3.7**  
**Fix Asset Turnover Ratio Equation**

$$\text{FATO} = \frac{\text{sales}}{\text{AFA}}$$

The FATO is to assess the business efficiency. The criterion is, the higher the fixed asset turnover ratio, showed that the faster the rate of turnover in fixed assets, fixed assets idle is less; On the other hand, it shows a serious idle fixed assets. Of course, not a fixed asset turnover ratio, the higher the better, the high rate of fixed assets showed that over-investment in fixed assets will shorten life (Davenport, 1998).

#### 3.4.1.4. Total Asset Turnover Ratio (TATO)

The total asset turnover ratio (TATO) is the ratio of corporate sales and total assets, the formula is: total asset turnover ratio = sales / total assets.

Mathematically it is written as:

**Equation 3.8**  
**Total Asset Turnover Ratio Equation**

$$\text{TATO} = \frac{\text{sales}}{\text{total assets}}$$

This indicator is used to measure not only whether the total assets of the enterprises is used at the proper ratio with the revolving speed, but also indicates the high and low of the total assets efficiency.

#### 3.4.2. Efficiency Ratio

Efficiencies in the use of funds can be measured by: *First*, current ratio is current assets in order to repay current liabilities of the comprehensive ability.

Current ratio is defined mathematically as:

**Equation 3.9**  
**Current Ratio Equation**

$$\text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

Criterion of current ratio is: the lower the rate means that companies do not have a strong short-term solvency. However, if the ratio is too high, that may be

of poor corporate leverage, the management is too conservative and will lead to the use of corporate short-term capital. It indicates poor efficiency.

*Second*, Acid Ratio is the enterprise liquid assets to repay current liabilities of the comprehensive ability. Acid ratio is defined mathematically as:

**Equation 3.10**  
**Acid Ratio Equation**

$$\text{Acid ratio} = \frac{\text{current assets} - \text{inventory}}{\text{current liabilities}}$$

*Third*, Liquity, is deducted from current assets realized by the speed of the slowest of assets such as stocks. And it can be used to pay off current liabilities that part of the current assets. The view was expressed that it should be:

**Equation 3.11**  
**Liquity Equation**

$$\text{Liquity} = \frac{\text{Liquid Assets}}{\text{current liabilities}}$$

Liquid assets consist of current assets, deferred expenses, stock, pre-paid accounts. This view is relatively stable. Current assets are any kind of assets that can be used to pay current liability; deferred expenses are expenditures that have taken place. If the current and subsequent phases of the share of assessments in the period a year less than the cost, it means there is no liquidity in stock; the significance of pre-paid accounts with the same inventory. Acid ratio and the

current ratio, show the better the performance of a short-term solvency of enterprises, and enterprises to use the funds efficiently.

Comprehensive analysis on the implementation of ERP systems for the company's resources to help improve management efficiency, these are reflected in the efficient management of assets and funds management efficiency. For this purpose the three efficiency criteria will be used.

**Table 3.1**

Independents Effect on Dependent Variable

Var	Correlation to Efficiency	Criteria
WGTO	Positive	The Higher the better
ARTO	Adjustment	Adjustment
FATO	Adjustment	Adjustment
TATO	Adjustment	Adjustment
ACR	Positive	The higher the better
LIQUITY	Adjustment	Adjustment

Source: Adopted from Zhang and Wang (2004)

### 3.5. Research Model

In proving the hypothesis stated in chapter II, this research implements Multiple Linear Regression (Gujarati, 2004). General equation can be written as:

**Equation 3.12**

#### Multiple Linear Regression

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e$$



**Table 3.2**  
**Variables**

Variable	Descriptive
Non-ERP Adoption	Adoption ERP =1, No adoption ERP=0
WGTO	Inventory turnover ratio
ARTO	Account Receivable turnover ratio
TATO	Total asset turnover
FATO	Fixed asset turnover
LIQUITY	Current ratio
ACRATIO	Acid ratio

Source: Adopted from Zhang and Wang (2004)

The indicators mentioned above become variables in this model. Concerning the variables in Table 3.2, equation 3.12 is modified as follow:

**Equation 3.13**  
**Modified Equation of Equation 3.12**

$$\Delta \text{Efficiency Ratio} = \beta_0 + \beta_1 \text{PostRatio} + \beta_2 \text{NonERPAdoption} + \beta_3 \text{NonERPPostRatio} + e$$

$\Delta$  Efficiency Ratio is counted by subtracting each financial ratio in t1 to t3 (after implementation of ERP) by financial ratio t-3 to t-1 (before ERP takes place). There are two kind of efficiency resource management; *first*, assets management efficiency and *second*, financial management efficiency. Asset management consists of WGRO, ARTO, FATO and TATO, and financial management consists of ACR and LIQUITY (Zang and Wang 2004). PostRatio is the efficiency of resource management after the implementation of the ERP system. PostRatio indicator consists of WGTO (inventory turnover rate), ARTO

(accounts receivable turnover), FATO (fixed asset turnover ratio), TATO (total asset turnover ratio), LIQUITY (current ratio) and ACRATIO (Acid ratio).

Non-ERP adoption = 0 that there is no implementation of ERP systems, ERP adoption = 1 that the implementation of the ERP system. This is different from Zang and Wang (2004) model where Non-ERP adoption = 1 and ERP adoption = 0. Basically the dummy variable is the device to classify data into mutually exclusive such as male and female (Gujarati 2004), but in this case 0 and 1 have different meaning. Using ERP in a company or organization we can say it is better off, upward, improved and so on, so the dummy is up (1). Without ERP implementation, the company or the organization is steady, static or even worst off, downward, bankrupt and so on, so the point dummy is 0.

The equation 3.11 if dummy is 0 for the implementation of ERP that means the independent variables which influence the efficiency are independent variables before ERP. It absolutely has nothing to do with the efficiency, because the improvement of resource management of the company never takes place.

### **3.6. Statistical Test**

Statistical test consists of Descriptive Statistics test, One Sample t-test, Student t-test and Goodness of fit test. Descriptive test is a kind of test to identify the changes in each variable, one sample t-test is for identifying significance of mean, student t-test is for identify significance of each dependent variable and goodness of fit test is for identifying how the regression line fit to the data observed.

### 3.6.1. Descriptive Statistics Test

As the research which was conducted by Zang and Wang (2004), this research uses PreAVG, that is average of each financial ratio from year t-3 to t-1 and t1 to t3. Technically to detect the improvement of efficiency is by comparing the mean of each financial ratio with certain kind of criteria above.

### 3.6.2. One Sample *t*-test

The sample *t*-test procedure compares the means of two groups or (one-sample) compares the means of a group with a constant. This procedure is a test for Equality of Means by putting a weight ( $w_{ki}$ ) on each case ( $X_{ki}$ ), for example:  $w_{ki}$  is weight for sample  $i$  in group  $k$  and  $X_{ki}$  is case  $i$  in group  $k$ . Then  $n_k$  is number of cases in group  $k$  and the sum of weight is symbolized with  $W_k$ , that is total weight in group  $k$ . One sample *t* test is better than *Arithmetic* mean or *Geometric* means for the purposes, because this formula uses weighting procedure, so the result is not affected by scale.

The *t* test is formulated as<sup>1</sup>:

#### Equation 3.14

#### One Sample *t* test Equation

$$t = \frac{D}{Sd}$$

Where  $D$  is deviation ( $X - \bar{X}$ ) and  $Sd$  is standard deviation. This number shows the percentage of the cases can be explained by the mean. Statisticians

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<sup>1</sup> The formula from SPSS 16 program tutorial.

usually use 95% or p value 5% (100 – 95%). So it will be ideal if the p or significant value under 5%.

Technically this research divides the analytical model with three folds. *First*, one sample t test before comparison with resource management efficiency, *second*, one sample t-test on resource management efficiency and *third*, one sample t test on resource management efficiency after the implementation of ERP.

### 3.6.3. Student t-test

An approach to the confidence-interval method of testing statistical hypotheses is the test-of-significance approach. Test of significance is a procedure by which sample results are used to verify the truth or falsity of a null hypothesis ( $H_0$ ). The key idea behind tests of significance is that of a test statistic (estimator) and the sampling distribution of such a statistic under the null hypothesis. The decision to accept or reject  $H_0$  is made on the basis of the value of the test statistic obtained from the data at hand (Gujarati, 2004 p. 129).

#### Equation 3.15 Student t test Equation

$$\Pr[\beta_2^* - t_{\alpha/2} \text{ se}(\hat{\beta}_2) \leq \hat{\beta}_2 \leq \beta_2^* + t_{\alpha/2} \text{ se}(\hat{\beta}_2)] = 1 - \alpha$$

Equation 3.4 gives the interval which  $\hat{\beta}_2$  will fall in  $1 - \alpha$  probability. In the language of hypothesis testing, the  $100(1 - \alpha)\%$  confidence interval established in equation 3.4 is known as the *region of acceptance* (of the null hypothesis) and the

region(s) outside the confidence interval is (are) called the region(s) *of rejection* (of  $H_0$ ) or *the critical region(s)*.

The  $H_0$  states that the independent variable is not partially significant. However, significances of each partial independent variable are tested by statistics  $t$  test. The independent variable performs significant influence toward dependent variable if significant value is lower than 5%. Otherwise, that is the equation not significant, is rejected. To anticipate the rejection of the hypothesis, statisticians create alternative hypothesis. Alternative hypothesis states, that the equation is significant, where the significant value is under confidence level.

The test of hypotheses will use SPSS, or E-views program to make the calculation easier rather than do manually. The program will count the significant level automatically. Manually, to test the significance can be compared with table of  $t$ , with the criteria as follows:

- a. If value of  $t > t$  table with confidence interval 95% or confidence level 5%, the independent variable has no a significant influence toward the dependent variable.
- b. If value of  $t < t$  table with confidence interval 95% or confidence level 5%, the independent variable has a significant influence toward the dependent variable.

The  $t$  value can be measured by  $\beta$  divided by standard error of  $\beta$ . Mathematically it is written as:

**Equation 3.16**  
**T value Equation**

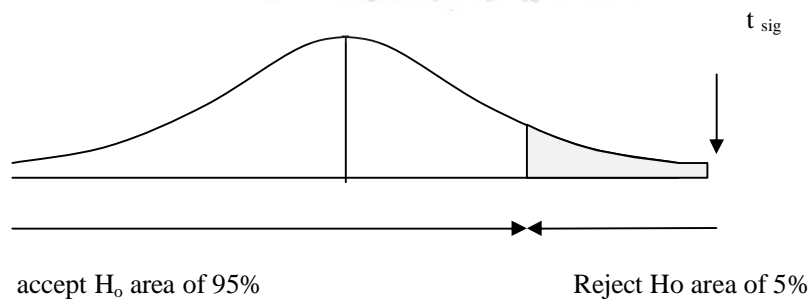
$$T \text{ value} = \frac{\beta}{se(\beta)}$$

In equation 3.5  $\beta$  is constant or coefficient of any parameter in the regression model,  $se \beta$  is standard error of  $\beta$ . If standard error of  $\beta$  is small so  $t$  value is big, and the coefficient is more significant.

The  $t$  value can be detected graphically. In figure 3.1 below all the area of  $t$  distribution is 100%. With confidence level or  $p$  value 5% the confidence intervals is 95%, where  $H_0$  is accepted. If the  $t$  value falls around 95% so  $H_0$  is accepted and the coefficient is not significant. In the other hand if  $t$  value falls around 5%  $H_a$  is accepted and the coefficient is significant.

**Figure 3.1:**

**Student  $t$  distribution**



Using confidence level 5% is the goal for any research. In many cases the researcher uses 10, or 25% and in the other case the level is much lower than 5%,

maybe 0.1% or lower. The important thing is confidence level should explain the phenomena of certain kind of object (Gujarati 2004).

In this research, the procedure of t-test that will be used to detect the mean is one sample t-test. T-test is an analysis involving two identical measured objects with certain different treatment. The first measurement is performed before the ERP implementation, while the second measurement is conducted after the implementation (Zang and Wang, 2004).

#### 3.6.4. Goodness of Fit test

We shall find out how “well” the sample regression line fits the data. Generally the observed data lie above or under regression line. The lag between observed data and regression line is called residual. How well a regression line fit the data is measured with *coefficient of determination*  $R^2$  it is also called *goodness of fit coefficient* (Gujarati 2003).

Recall for equation 3.1, or simply it is written as  $Y=f(X)+e$ , where  $e$  is residual term. When the regression line is found, by implementing  $X$  into the regression line, the  $Y$  counted is found. Say the first  $Y$  the equation 3.1 is observed number, the  $Y$  counted will exceed or lower the regression line. The lag or residual term can be counted by subtracting  $Y$  observed and  $Y$  counted, and in square it is called *Residual Sum Square (RSS)*. In the other hand there is a mean where  $Y$  observed subtract by mean in square will find *Total Sum Square (TSS)* and  $Y$  counted subtracted by mean in square will find *Explained Sum Square (ESS)*. Coefficient goodness of fit can be found by:

**Equation 3.17**  
**Goodness of fit test Equation**

$$R^2 = \frac{ESS}{TSS}$$

Or it is can be formulated as:

$$R^2 = \frac{(\sum x_i y_i)^2}{\sum x_i^2 \sum y_i^2}$$

Where  $x_i$  is  $(X - \bar{X})$  and  $y_i$  is  $(Y - \bar{Y})$ , so the coefficient determination is the ratio of sum square of deviation X times deviation Y and sum of square of deviation X times sum of square of deviation Y.

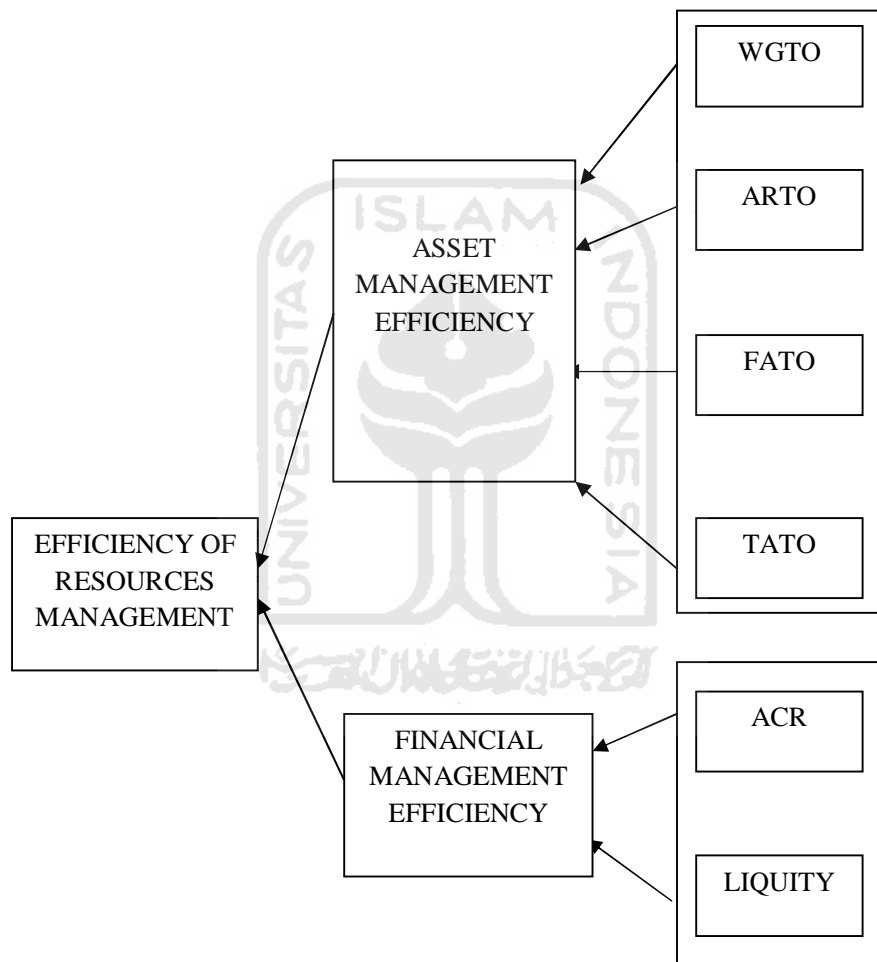
The properties of  $R^2$  are: *first*, lies between  $0 < R^2 < 1$ , *second*, there is no cause and effect relationship with dependent or independent variables. When  $R^2$  is 0, it indicates that there is no relationship between dependent and independent variable. When  $R^2$  is 1 the relationship between dependent and independent variables is mechanical.



### 3.7. Research Framework

Figure 3.2

Research Framework Map

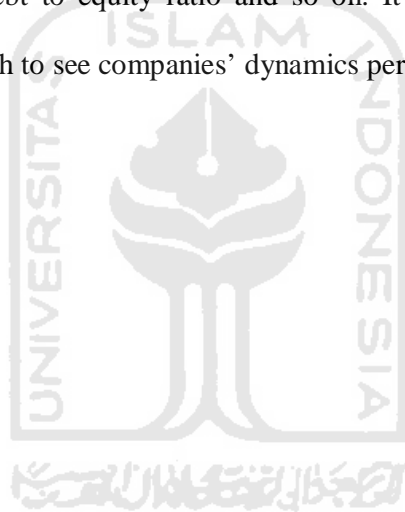


Source: Adopted from Zang and Wang (2004)

Resource Management Efficiency depends on Inventory turnover (WGTO), Account Receivable turnover (ARTO), Fix Assets turn over (FATO), Total Assets turnover (TATO), Acid ratio (ACR) and Liquid Assets (LIQUITY).

### **3.8 Research Constraint**

This research only implements six financial ratios. There are many more financial ratio that cannot be covered in this research such as rate on investment (ROI), leverage, total debt to equity ratio and so on. It is expected that these financial ratios are enough to see companies' dynamics performance in Indonesia.



## Chapter IV

### RESEARCH FINDING AND DISCUSSION

#### 4.1 Data Description

There are many kinds of sample selection, and in this research is using *Purposive sampling* method is used. *Purposive sampling* method is a sample where the researchers use their own judgments to select. It is often utilized with very small sample or population within qualitative research, particularly case study or grounded theory. This approach cannot yield statistical interference about the population. Sometime cases are selected for being unusual or special or particular related to research question(s) (Morgan, 2008 and also Sue, 2008).

Data for this research is secondary data available in Indonesia Capital Market Directory (ICMD). From ICMD there are 386 companies data in hand. The sampling frame as was mentioned in chapter III, consists of four criteria. First criterion is the public companies, which are listed in ICMD and have implemented SAP for minimum of 3 years. Those which are out of First Criterion are 214 companies and which match the first criterion are 172 companies. The second criterion is ERP implementation within the public companies should finish before December 31st, 2010. Out of second Criterion are 38 companies and match to the second criterion are 134 companies. The third criterion is ERP implementation within the public companies should finish before December 31st, 2010. Out of third Criterion are 100 companies and match to the third criterion are 34 companies. The fourth criterion is ERP implementation within the public

companies must should finish before December 31st, 2010. Out of fourth Criterion are 8 companies and match to the fourth criterion are 26 companies.

**Table 4.1**  
Sample Selection Procedure

Criteria	Total Firms
The public companies, listed in ICMD	386
Out of First Criterion	214
1. The public companies, listed in ICMD and have implemented ERP for minimum of 3 years.	172
Out of second criterion	38
2. ERP implementation within the public companies should finish before December 31st, 2010.	134
Out of Third criterion	100
3. The public companies listed in ICMD actively publish their annual financial statement during the research period (1, 2, 3 year before and 1, 2, and 3 years after ERP implementation).	34
Out of Fourth criterion	8
4. The annual financial statements per December 31st are available for each public companies in 1, 2, 3 year before and 1, 2, and 3 years after ERP implementation.	26

Source Adapted from: Indonesian Capital Market Directory

Moreover the list of 26 companies data that used in this research can be seen in the table 4.2 below.

**Table 4.2**  
**Data of Company SAP Implementation Year**

No	Code	Company's Name	Implementation Year
1	ASGR	Astra Graphia Document & IT Solution	2000
2	MTDL	Metrodata Electronics	2000
3	BBCA	Bank BCA	2002
4	CPIN	Charoen Phokpand Indonesia	2001
5	ULTJ	Ultrajaya Milk	2003
6	AQUA	Aqua Golden Mississippi	2003
7	INKP	Indah Kiat Pulp & Paper	2003
8	SMCB	Holcim Indonesia	2003
9	INTA	Intraco Penta	2003
10	TSPC	Tempo Scan Pacific	2003
11	TGKA	Tigaraksa Satria	2004
12	AUTO	Astra Otopart	2004
13	RMBA	Bentoel International Investama	2004
14	PRAS	Prima Alloy Steel	2004
15	DYNA	Dynaplast	2004
16	TINS	Timah	2005
17	UNTR	United tractor Indonesia	2002
18	WICO	Wicaksana Overseas International	2001
19	DLTA	Delta Djakarta	2000
20	HDTX	Panasia Indosystec	2002
21	IKAI	Inti Keramik Alamasri Industri	2001
22	INDF	Indofood Sukses Makmur	2000
23	JPFA	Japfa	2001
24	MEDC	Medco Energi International	2002
25	MYOR	Mayora Indah	2000
26	TKIM	Pabrik Kertas Tjiwi Kimia	2002

Source Adapted from: Indonesian Capital Market Directory

## 4.2. Research Findings

Table 4.3 demonstrates the mean of the financial ratio with no ERP implementation from year 1, 2, 3 after implementation, which are the independent variables for this research. Table 4.4 demonstrates mean of financial ratio with ERP implementation from year 1, 2, 3 before implementation.

**Table 4.3**

### Description of Financial Ratio with ERP Implementation

Variables	PreAVG	t 1	t 2	T 3	Total
WGTO	5.27388523	4.50007091	5.060354483	6.261230298	5.27388523
t Before Com	2.609(0.015)	2.871(0.008)	2.686(0.013)	2.335(0.028)	4.402(.000)
t After Com		0.441(0.663 <sup>3</sup> )	-0.553(0.585 <sup>x</sup> )	-1.535(0.137)	
ARTO	9.821229778	14.6791077	7.740617406	7.043964226	9.821229778
t Before Com	2.517(0.019)	2.163(0.040)	2.851(0.009)	3.03(0.006)	3.845(0.000)
t After Com		-1.729(0.096*)	-2.377(0.025)	-2.81(0.009)	
FATO	2.642439215	2.24880267	2.419004473	3.2595105	2.642439215
t Before Com	7.668(.000)	6.566(.000)	7.796(0.000)	5.72(.000)	10.718(0.000)
t After Com		1.495(0.147)	1.769(0.089*)	-1.161(0.257 <sup>x</sup> )	
TATO	0.792731765	0.6746408	0.725701342	0.97785315	0.792731765
t Before Com	7.668(.000)	6.566(.000)	7.796(0.000)	5.72(0.000)	10.718(0.000)
t After Com		1.495(.147**)	1.769(.089)	-1.161(0.257 <sup>x</sup> )	
ACR	-4.854250669	-7.28910725	-4.514441803	-2.75920296	-4.85425067
t Before Com	4.569(0.000)	-2.307(0.030)	-2.605(0.015)	-2.152(0.041)	-3.803(0.000)
t After Com		2.075(0.048)	2.14(0.042)	0.696(0.493)	
LIQUITY	0.549400894	0.56352757	0.554499113	0.530176003	0.549400894
t Before Com	4.545(0.000)	4.704(.000)	4.662(0.000)	4.045(0.000)	7.812(0.000)
t After Com		-1.609(0.120)	-0.993(0.330 <sup>x</sup> )	-0.028(0.978 <sup>x</sup> )	

\*\* Significant at 25% confidence level, \* at 10%, <sup>x</sup> not significant

Source: Secondary data processed, 2012

**Table 4.4**

Description of Financial Ratio with no ERP Implementation

Variables	PreAVG	t-3	t-2	t-1	Total
WGTO	2.370906035	2.5628404	1.997622502	2.552255204	3.805767822
	4.094(0.000)	3.472(0.002)	3.592(0.001)	5.557(0.000)	5.962(0.000)
ARTO	5.443017994	5.20266084	5.56517504	5.5612181	5.443017994
	2.878(0.008)	3.664(0.001)	2.677(0.013)	2.514(0.019)	4.936(0.000)
FATO	2.983022951	2.99022745	3.070166277	2.88867513	2.983022951
	7.077(0.000)	6.199(0.000)	7.093(0.000)	7.532(0.000)	12.034(0.000)
TATO	0.894906885	0.89706823	0.921049883	0.866602539	0.894906885
	7.078(0.000)	6.211(0.000)	7.08(0.000)	7.622(0.000)	11.134(0.000)
ACR	-1.969704368	-1.98435128	-1.772823093	-2.15193873	-1.96970437
	-1.822(0.08)	-1.667(0.108)	-1.59(0.124)	-2.01(0.055)	-3.068(0.003)
LIQUITY	0.483901694	0.45096283	0.473669148	0.527073103	0.483901694
	5.377(0.000)	5.033(0.000)	4.854(0.000)	5.637(0.000)	9.05(0.000)

Source: Secondary data processed, 2012

In order to investigate the data, this research uses mean of each financial ratio, namely PreAVG. PreAVG is average of financial ratio from t-3 to t-1 or from t1 to t3. The lower standard error here is indicated by the bigger sample t test value. The following phenomena that are found based on table above:

1. WGTO is better off. The inventory turnover is seen lower than before the implementation the value is 2.37 with t value 4.094 and p value 0.000 (table 4.4). And after the implementation, the result is from 5.27 with t value 2.609 and significant value 0.015 (table 4.3). This proof can also be seen in the development from year 1, 2, 3 before implementation (t-3 to t-1) compare

with year 1, 2, 3 after implementation (t1 to t3) and total comparison from year 1, 2, 3 before and after implementation (t-3 to year t3).

2. ARTO is not showing a good development after the implementation of ERP. This financial ratio is not under control of the company, so it depends on outside variables, such as ability of company's partner to pay the account payable.
3. FATO is better off. In table 4.4 FATO, the average is 2.98, with t value 7.077 and significant value 0.000 (table 4.4), while without ERP program the value is 2.64, with t value 7.668 and significant value 0.000 (table 4.3).
4. TATO is better off. With ERP program TATO average is 0.89, with t value 7.078 and significant value 0.000 (table 4.4). Without ERP program average is 0.79, with t value 7.668 and significant value 0.000 (table 4.3).
5. ACR increases. The ACR ratio increases from -4.85 with t value 4.569 and significant value 0.000 (table 4.3) before ERP program, to -1.9697 with t value -1.822 and significant value 0.08 (table 4.4) after the program went life.
6. LIQUITY decreases. After the implementation of ERP the average is 0.48 with t value 5.377 and level of significance 0.000 (table 4.4). Before the implementation of ERP the average is 0.549 with t value 4.545 and level of significance 0.000 (table 4.3).

The regression result shows the effect of ERP comprehensively. Table 4.5 shows the intercept and the regression coefficient of each PostRatio. WGTO shows a significant negative relationship with  $\Delta$ efficiency. However, in



ERPxPostRatio, WGTO shows a positive relationship with  $\Delta$ efficiency but significant in level 25%. The coefficient of goodness of fit is 0.03 which indicates that the regression function of WGTO is not appropriate to predict the efficiency.

**Table 4.5**  
Regression Result

Variables	Intercept	PostRatio	ERP	ERPxPostRatio	Adj R2
WGTO	-0.445	-0.117	-0.644	0.124	0.03
SE	0.496	0.042	0.73	0.09	
Sig	0.371 <sup>x</sup>	0.006	0.379 <sup>x</sup>	0.169 <sup>**</sup>	
ARTO	0.205	-0.233	0.079	0.096	0.453
SE	0.382	0.034	0.527	0.037	
Sig	0.593 <sup>x</sup>	0.000	0.881 <sup>x</sup>	0.011	
FATO	-0.354	-0.269	-1.812	0.638	0.012
SE	0.706	0.207	1.037	0.292	
Sig	0.617 <sup>x</sup>	0.195 <sup>**</sup>	0.083 <sup>*</sup>	0.03	
TATO	-0.354	-0.897	-1.812	2.127	0.012
SE	0.706	0.689	1.037	0.972	
Sig	0.617 <sup>x</sup>	0.195 <sup>**</sup>	0.083 <sup>*</sup>	0.03	
ACR	-1.904	-0.173	0.635	0.069	0.113
SE	0.462	0.038	0.644	0.084	
Sig	0.000	0.000	0.326 <sup>x</sup>	0.413 <sup>x</sup>	
LIQUITY	-2.32	2.285	0.409	-0.537	0.067
SE	0.582	0.705	0.854	1.164	
Sig	0.000	0.001	0.632 <sup>x</sup>	0.646 <sup>x</sup>	

\*\* Significant at 25% confidence level, \* at 10% <sup>x</sup> not significant

Source: Secondary data processed, 2012

The coefficient of ARTO is -0.233 and significant level is 0.000. Indicate that there is a negative significant correlation with efficiency. The goodness of fit is the best among other PostRatio, that is 0.453.

FATO coefficient is -0.269, but not significant, while the goodness of fit is 0.012. The FATO is not good enough to affect the efficiency. Almost similar with FATO, the TATO also indicates the same pattern, that is negative correlation and not significant with efficiency.

ACR indicates negative significant correlation with efficiency, the coefficient is -0.173 and the significant level is 0.000. The goodness of fit is second best after ARTO value, which is 0.113.

LIQUITY coefficient is 2.285 and significant level is 0.001. It can be said that LIQUITY has a positive significant correlation with the efficiency, even though the goodness of fit is low.

#### **4.3. The Result of Hypothesis Testing**

Based on the result of data testing and the explanation above, the result can be interpreted into this hypothesis testing:

**H<sub>1</sub>: Implementation of ERP system in the asset management efficiency has significant advantages, compare to non implementation of ERP systems.**

After the implementation of ERP program, WGTO is better. It can be seen after the implementation that the rate is lower. By definition WGTO is ratio between inventory and cost of sales. If the WGTO increases there will be less

inventories in the storage or the cost of sales is higher and if the WGTO decreases it indicates that the inventory is higher in the storage or the cost of sales gets lower. The higher the criterion for WGTO, the better the advantages of the sales. It will reduce cost for storage and reduce product damage. When the efficiency is higher the WGTO is higher, or statistically the correlation between WGTO and efficiency is positively significant. This matches to the theory of WGTO performance.

Theoretically ARTO is the ratio between sales and account receivable. Account receivable depends on the availability of fund in company partner to pay their debt. In this research ARTO has nothing to do with efficiency for the decision to pay the debt is not under the company's control. The company cannot enforce its company partner to pay the company's debt, because it is considered improper and will make a bad relationship with the company's partner. However in regression result, the correlation between efficiency and ARTO is negative significant, which lead to the conclusion that bigger sales with constant account receivable and also constant sales with lower account receivable are less efficient. To put it another way, lower sales with constant account receivable are more efficient and also constant sales with lower account receivable.

FATO by definition is ratio between sales and average fix assets. Simply if the FATO increases, it indicates the sales increase or average fix assets decrease. In relation with efficiency, if FATO increases because the sales increase, that will be more efficient. However, if the FATO increases because the average fix assets turnover decreases, it indicates that the company too much puts investment on fix

assets. And it is not efficient. In regression result FATO has a negative correlation with efficiency. The higher FATO will decrease the efficiency. Based on the inventory turnover result, which is decreasing, this phenomenon leads to the conclusion that higher FATO is caused by increasing sales and FATO is better off.

By definition TATO is ratio between sales and total assets. The descriptive statistics shows that TATO increases, which means the company's sales increase or total assets decrease. The regression result shows that the correlation between efficiency and TATO is negative but not significant or significant at 25% confidence level. Based on decreasing inventory turnover, this evidence leads to conclusion that the increase of TATO is due to increase in sales and TATO is better off.

**H<sub>2</sub>: Implementation of ERP systems in the fund management efficiency has significant advantages, compare to non implementation of ERP systems.**

ACR is the ratio between current assets minus inventory and current liability. The increase of ACR can be caused by decreasing liability or decreasing inventory or increasing current assets. Theoretically decreasing liability and increasing current assets make company performance less efficient. However, decreasing inventory and decreasing current assets make company more efficient. The regression result shows that the correlation between efficiency and ACR is negative significant. From this evidence the conclusion is increasing ACR is due to decreasing current liability and decreasing in inventory.

LIQUITY is ratio between liquid assets and current liability. The Increase in LIQUITY is caused by the increase in liquid assets or decrease in current liability. The correlation with efficiency is positive significant. The conclusion is the increase in LIQUITY is due to the decrease in current liability which increase efficiency.

The effect of ERP implementation is summarized in table 4.6.

**Table 4.6**

The Effect of ERP implementation.

Variables	Affect after Implementation
WGTO	Better
ARTO	Not Effective
FATO	Better
TATO	Better
ACR	Better
LIQUITY	Better

Source: Secondary data processed, 2012

The asset management efficiency measurement consists of: WGTO, ARTO, FATO and TATO. All variables show better efficiency after the ERP program is implemented. This evidence proves H1, where the implementation of ERP systems in the asset management efficiency has significant advantages, comparative with non implementation of ERP systems.

The financial management efficiency measurement consists of ACR and LIQUITY. These two measurements show better performance after the

implication of ERP. It leads to the conclusion that H2, where the implementation of ERP systems in the fund management efficiency has significant advantages, compared with non implementation of ERP systems. And it has been proved.

This research consists of two hypotheses that have been tested. Based on the result of this research, all of hypotheses are proven and supported by the data. The result of these hypotheses testing can be summarized on table below:

**Table 4.7: Result of Hypothesis Testing**

	Phrase	Result
H <sub>1</sub>	The implementation of ERP systems in the asset management efficiency has significant advantages, compare to non implementation of ERP systems.	Proved
H <sub>2</sub>	The implementation of ERP systems in the fund management efficiency has significant advantages, compare to non implementation of ERP systems.	Proved

## Chapter V

### CONCLUSION AND RECOMMENDATION

This chapter discusses the overall conclusion drawn from the analysis of the data. It also includes the recommendation and the suggestion for the future research concerned with this study.

#### 5.1 Conclusion

Based on the research question and the result in data analysis that has been stated in the previous chapter, in this part the researcher want to summarize the result of the hypotheses that have been tested can be summarized as follows:

1. The implementation of ERP systems in the asset management efficiency have significant advantages, compare to non-implementation of ERP systems.

Based on the data analysis that has been done for this hypothesis, it can be concluded that the implementation of ERP systems in the asset management efficiency has significant advantages, compare to non-implementation of ERP systems. And it has been proved. The ERP is useful in improving assets management efficiency, precisely in assets management efficiency, how it does improve the inventory turnover ratio, fix asset ratio and total asset ratio. Fix assets turnover and total assets turnover have no positive significant correlation with efficiency (based on the regression result). The increasing sales affect the fixed assets and total assets turnover lower. The company puts investment too

much on fix assets turnover and in turn on total assets. This situation may causes the fix assets turnover and the total assets turnover are not correlate significantly positive with the efficiency. Moreover, if the fix asset and total asset remains steady or decreasing, but sales increasing, it means that the profit increasing and has a positive correlation with efficiency (based on the descriptive analysis shows the increasing level of efficiency).

2. The implementation of ERP systems in the fund management efficiency have significant advantages, compare to non-implementation of ERP systems.

Based on the data analysis conducted for this hypothesis, it can be concluded that the implementation of ERP systems in the fund management efficiency have significant advantages, compare to non-implementation of ERP systems. And it has been proved. The ERP is useful in improving financial management efficiency precisely in acid ratio and liquid asset improvement. Acid ratio is lower due to increasing in current liabilities.

Acid ratio has a negative significant correlation with efficiency because acid ratio depends on the increase in current assets and decrease in current liabilities. It means the company's management tends not to be conservative. For einstance, if production scale increases, the management is not reluctant to increase its current liabilities, because higher productions need higher finance. After the implementation of



ERP liquid assets per current liabilities has a positive significant correlation with efficiency. Because of the increase in liquid assets and decrease in current liabilities the efficiency increases.

## **5.2 Limitation**

This research has limitations as follows:

1. Before implementing ERP, the companies face the difficulties paying current and long term liabilities. Moreover companies are hard to expand their business. In other word, it means that the efficiency of research management decreases.
2. The companies tend to focus in one product of integration software like ERP, although they realize that there are some other programs that also improve company's efficiency in certain period of time.

## **5.3 Recommendation**

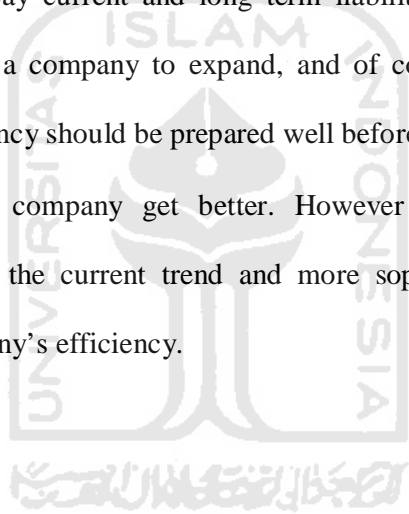
Based on the limitation that exists in this research and for developing the topic to a better future research, some recommendations will be the following:

1. For better resource management efficiency it is better for the company to increase average fixed assets turnover. The company's earning generated by increasing sales could invest in liquid assets. In the other hand decreasing inventory turnover will make more idle storage in the company. These rooms are better for rent to company's partner, such as suppliers, marketers or outlet.

The idle storages which are changed into company's partner facilities will make better collaboration with another party. Less idle room will decrease fix assets and total assets which mean fix assets turnover ratio and total assets turnover ratio is better. If the idle storages are changed into company's outlet, the company will enter the market which mean the company can monitor the customers' interest.

Increase earning from sales which invest to liquid assets will increase the ability to pay current and long term liabilities. This could create confidence for a company to expand, and of course the management resource efficiency should be prepared well before its execution.

2. ERP makes a company get better. However it is better to keep monitoring for the current trend and more sophisticated program to improve company's efficiency.



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# APPENDICES



## Appendix 1: Raw Data

### Appendix 1a: Cost of Product Sales

	-3	-2	-1	1	2	3
ASGR	141,902.376	130,735.937	180,298.579	213,572.798	213,258.162	218,336.174
MTDL	6,933.783	9,481.139	15,591.930	21,119.904	28,426.211	28,860.541
BBCA	3,742.354	5,416.964	5,311.328	6,074.990	7,307.653	6,268.991
CPIN	22,567.494	21,475.471	18,497.654	18,054.545	23,158.234	24,175.789
ULTJ	7,071.977	6,485.276	4,768.361	11,127.727	12,428.502	12,897.246
AQUA	12,775.568	10,105.703	9,932.502	13,145.221	14,644.039	16,362.441
INKP	7,969.737	8,611.602	8,752.141	10,672.338	10,936.231	11,894.842
SMCB	6,088.103	9,006.349	7,820.461	10,946.854	12,954.523	13,510.096
INTA	4,774.555	5,072.900	5,725.887	7,776.027	10,206.624	10,824.286
TSPC	8,969.620	10,550.963	10,364.281	14,389.421	14,785.966	15,389.256
TGKA	7,266.208	9,586.119	11,328.945	12,491.006	14,308.487	14,868.628
AUTO	2,166.901	2,227.671	4,092.186	13,186.800	14,924.741	15,747.122
RMBA	939.989	2,193.559	3,723.734	6,644.425	18,246.800	18,495.418
PRAS	17,214.391	15,736.325	17,629.607	18,790.773	19,598.121	23,130.578
DYNA	56,589.584	74,535.078	91,009.771	81,820.526	123,273.169	124,253.133
TINS	4,178.676	4,991.188	6,875.382	8,496.864	10,024.869	12,157.888
UNTR	21,540.741	21,126.612	21,087.132	23,909.280	23,404.128	24,891.975
WICO	1,268.934	4,518.987	17,902.046	23,130.131	24,165.393	25,140.790
DLTA	15,337.384	15,606.652	16,376.016	17,461.754	20,699.874	22,593.287
HDTX	5,547.774	9,454.340	10,160.441	12,860.907	13,429.056	15,491.985
IKAI	10,643.650	18,593.902	19,312.631	19,526.335	20,959.048	22,304.962
INDF	6,432.744	7,511.767	7,985.189	10,485.098	10,382.457	14,656.106
JPFA	6,700.008	6,321.629	7,982.315	8,436.384	9,903.685	10,773.851
MEDC	17,796.357	12,937.596	13,867.114	17,264.215	19,628.041	20,608.861
MYOR	9,620.780	9,322.959	9,200.782	11,215.833	14,057.846	16,921.578
TKIM	7,101.777	8,045.397	10,338.355	13,233.720	14,371.273	15,985.264

### Appendix 1b: Average Inventory

	-3	-2	-1	1	2	3
ASGR	28,110.943	27,408.169	28,093.373	39,034.347	39,199.002	39,109.178
MTDL	201.417	225.587	231.227	1,018.373	1,616.987	21,886.373
BBCA	214.666	220.033	225.534	284.784	566.490	1,552.914
CPIN	1,379.963	1,414.462	1,379.100	1,460.192	2,500.193	4,408.380
ULTJ	746.999	765.674	746.532	1,329.723	1,692.372	2,341.095
AQUA	3,535.567	3,623.956	3,533.357	6,360.581	22,685.032	19,619.245
INKP	539.153	552.631	538.816	450.163	423.963	5,144.590
SMCB	19,862.084	19,365.532	15,881.393	20,015.395	8,408.746	19,827.659
INTA	13,535.545	13,197.157	16,364.474	15,434.842	11,169.393	10,013.681
TSPC	13,060.451	12,883.940	14,536.086	12,694.476	15,199.002	18,625.403
TGKA	10,078.246	9,826.290	8,647.135	10,389.688	16,169.873	16,969.840
AUTO	1,436.205	1,400.300	1,232.264	1,073.950	1,466.490	2,412.809
RMBA	10,992.516	10,717.703	9,431.579	10,222.010	11,437.688	11,691.345
PRAS	14,197.775	13,842.831	12,181.691	18,401.688	17,346.813	15,670.261
DYNA	34,927.246	34,054.065	29,967.577	39,414.331	23,252.158	20,488.777
TINS	15,022.756	14,647.187	12,889.525	15,451.056	15,706.192	17,957.668
UNTR	23,922.305	27,742.473	32,813.376	45,137.508	38,198.527	42,822.850
WICO	6,530.699	6,530.699	5,747.015	15,961.929	25,074.016	27,977.875
DLTA	5,994.565	5,994.565	5,275.217	7,812.044	6,991.241	7,383.003
HDTX	10,889.390	10,889.390	8,275.936	11,781.702	15,765.626	16,039.013
IKAI	9,219.895	10,326.283	7,847.975	8,014.707	10,429.827	11,444.700
INDF	17,532.051	19,635.897	14,923.282	21,305.400	23,767.458	21,876.665
JPFA	10,148.361	11,366.164	8,638.285	8,263.917	16,913.142	18,259.976
MEDC	10,597.917	9,769.667	10,424.947	12,491.346	14,883.268	16,176.375
MYOR	22,265.225	24,937.052	18,952.159	17,754.675	16,575.568	17,595.831
TKIM	10,900.433	12,208.485	9,278.449	14,274.069	10,166.174	22,824.970

### Appendix 1C: Average Account Receivable

	-3	-2	-1	1	2	3
ASGR	47,927.843	104,274.27 4	108,204.60 8	141,768.04 3	146,751.86 3	204,302.11 0
MTDL	3,622.855	21,244.914	57,258.872	72,346.736	83,061.762	87,097.811
BBCA	49,333.689	67,897.288	73,642.808	98,074.379	100,552.83 9	104,336.17 4
CPIN	17,578.670	16,774.558	17,328.945	17,939.830	20,153.149	27,300.164
ULTJ	2,720.324	3,620.526	4,092.186	5,210.053	17,669.624	18,624.771
AQUA	125,506.12 9	183,611.02 0	192,373.40 3	214,884.58 2	221,339.16 5	222,431.58 3
INKP	29,093.187	27,590.566	29,629.607	29,746.280	30,358.100	35,048.500
SMCB	7,779.503	6,669.349	6,100.977	8,616.823	11,438.232	14,809.353
INTA	4,500.256	7,086.022	8,753.824	20,877.663	21,715.431	22,275.491
TSPC	37,211.630	69,306.642	98,713.143	120,784.21 0	134,199.41 4	134,700.43 2
TGKA	2,455.161	3,498.253	17,902.046	21,535.430	24,999.884	24,572.419
AUTO	38,480.026	37,931.536	47,601.611	46,339.833	86,998.739	108,992.90 5
RMBA	693.361	3,368.611	4,160.441	5,624.649	7,429.056	8,833.257
PRAS	7,917.080	14,357.169	13,312.631	22,404.413	23,995.905	25,803.954
DYNA	1,046.926	3,479.635	4,985.189	7,235.676	7,338.246	6,948.742
TINS	5,679.549	7,525.823	7,982.315	9,599.480	12,390.368	12,449.160
UNTR	3,797.104	7,784.919	7,867.114	16,532.916	16,628.041	18,632.100
WICO	2,357.100	2,569.473	3,500.782	6,674.351	8,057.846	9,654.963
DLTA	2,057.072	2,408.708	3,138.355	7,696.361	8,371.273	9,331.212
HDTX	693.361	3,368.611	4,160.441	5,624.649	7,429.056	8,833.257
IKAI	7,917.080	14,357.169	13,312.631	16,404.413	17,095.905	19,803.954
INDF	1,046.926	3,479.635	4,985.189	7,235.676	7,638.246	8,448.742
JPFA	5,679.549	13,525.823	7,982.315	12,599.480	15,390.368	17,916.000
MEDC	3,797.104	7,784.919	7,867.114	16,532.916	19,628.041	21,632.163
MYO R	2,357.100	2,569.473	3,500.782	6,674.351	8,057.846	8,504.176
TKIM	2,570.719	2,408.708	4,383.554	4,696.361	11,371.273	12,331.212

### Appendix 1d: Average of Fix Assets

	-3	-2	-1	1	2	3
ASGR	216,269.50 9	221,676.24 7	210,762.61 8	234,422.03 3	231,724.77 9	243,697.74 0
MTDL	8,978.682	9,203.149	7,287.338	11,829.870	14,921.130	17,815.837
BBCA	5,009.844	4,884.598	4,103.538	5,982.831	6,990.818	9,006.730
CPIN	11,265.986	12,617.904	11,447.686	12,799.316	14,030.815	15,621.370
ULTJ	3,432.999	3,844.959	3,419.805	9,966.974	14,465.310	15,778.511
AQUA	10,429.035	11,680.519	11,059.421	15,708.929	16,920.090	19,601.394
INKP	6,984.870	7,823.054	8,735.756	10,133.477	12,813.573	13,115.960
SMCB	22,312.880	24,990.425	24,554.006	25,626.475	27,973.108	28,368.736
INTA	12,904.202	14,452.706	14,070.501	15,059.221	17,376.790	16,556.047
TSPC	7,786.128	8,720.464	10,530.726	11,845.810	12,219.158	12,623.111
TGKA	125,984.87 9	141,103.06 5	129,132.40 6	143,871.22 1	145,497.16 6	153,303.95 1
AUTO	3,510.005	3,931.205	4,337.373	6,643.394	8,081.585	10,424.891
RMBA	3,507.423	3,595.109	3,778.766	7,760.844	8,405.194	10,222.857
PRAS	67,831.466	69,527.253	116,526.01 5	179,173.90 6	235,680.92 7	260,220.46 9
DYNA	166,439.95 3	170,600.95 2	166,256.90 4	223,005.52 3	223,133.91 3	246,513.92 7
TINS	9,348.268	9,581.974	9,585.925	13,687.396	13,897.435	14,787.361
UNTR	39,023.082	39,998.659	42,248.000	49,398.400	50,334.495	50,776.182
WICO	5,015.548	5,140.937	4,281.178	6,664.942	9,410.798	10,338.242
DLTA	70,033.717	71,784.560	94,272.732	114,418.18 6	124,304.17 3	136,677.81 3
HDTX	5,558.891	5,697.864	5,643.683	8,114.947	10,444.381	11,108.987
IKAI	107,505.62 9	110,193.27 0	93,910.167	123,128.13 4	124,365.63 0	127,730.13 2
INDF	16,643.995	17,060.095	25,506.470	21,060.776	21,536.185	26,755.430
JPFA	9,068.647	9,295.363	9,694.950	11,933.940	12,410.585	16,935.689
MEDC	83,419.660	85,505.151	85,242.329	149,079.49 6	145,986.38 8	151,934.23 0
MYO R	9,241.863	9,472.910	4,766.032	11,719.238	12,537.982	16,591.128
TKIM	10,812.335	11,082.643	10,416.758	14,900.109	15,536.904	15,428.914

### Appendix 1e: Sales

	-3	-2	-1	0	1	2	3
ASGR	473,007.92	435,786.46	600,995.26	619,763.64	711,909.33	710,860.54	727,787.25
MTDL	23,112.61	31,603.80	51,973.10	66,831.32	70,399.68	94,754.04	96,201.80
BBCA	12,474.51	18,056.55	17,704.43	18,424.96	20,249.97	24,358.84	20,896.64
CPIN	75,224.98	71,584.90	61,658.85	50,809.41	60,181.82	77,194.11	80,585.96
ULTJ	23,573.26	21,617.59	15,894.54	25,807.49	37,092.42	41,428.34	42,990.82
AQUA	42,585.23	33,685.68	33,108.34	35,696.80	43,817.40	48,813.46	54,541.47
INKP	26,565.79	28,705.34	29,173.80	32,080.36	35,574.46	36,454.10	39,649.47
SMCB	20,293.68	30,021.16	26,068.20	34,952.13	36,489.51	43,181.74	45,033.65
INTA	15,915.18	16,909.67	19,086.29	18,163.64	25,920.09	34,022.08	36,080.95
TSPC	29,898.73	35,169.88	34,547.60	37,570.83	47,964.74	49,286.55	51,297.52
TGKA	24,220.69	31,953.73	37,763.15	36,818.97	41,636.69	47,694.96	49,562.09
AUTO	7,223.00	7,425.57	13,640.62	19,796.49	43,956.00	49,749.14	52,490.41
RMBA	3,133.30	7,311.86	12,412.45	14,910.39	22,148.08	60,822.67	61,651.39
PRAS	57,381.30	52,454.42	58,765.36	63,246.06	62,635.91	65,327.07	77,101.93
DYNA	188,631.95	248,450.26	303,365.90	221,698.02	272,735.09	410,910.56	414,177.11
TINS	13,928.92	16,637.29	22,917.94	24,435.84	28,322.88	33,416.23	40,526.29
UNTR	71,802.47	70,422.04	70,290.44	72,436.93	79,697.60	78,013.76	82,973.25
WICO	4,229.78	15,063.29	59,673.49	57,757.38	77,100.44	80,551.31	83,802.63
DLTA	51,124.61	52,022.17	54,586.72	59,017.54	58,205.85	68,999.58	75,310.96
HDTX	18,492.58	31,514.47	33,868.14	38,597.75	42,869.69	44,763.52	51,639.95
IKAI	35,478.83	61,979.67	64,375.44	66,627.54	65,087.78	69,863.49	74,349.87
INDF	21,442.48	25,039.22	26,617.30	32,284.67	34,950.33	34,608.19	48,853.69
JPFA	22,333.36	21,072.10	26,607.72	27,532.72	28,121.28	33,012.28	35,912.84
MEDC	59,321.19	43,125.32	46,223.71	53,225.56	57,547.38	65,426.80	68,696.20
MYOR	32,069.27	31,076.53	30,669.27	32,464.50	37,386.11	46,859.49	56,405.26
TKIM	23,672.59	26,817.99	34,461.18	41,629.06	44,112.40	47,904.24	53,284.21

### Appendix 1f: Inventory

	-3	-2	-1	0	1	2	3
ASGR	93703.14192	91360.56338	93644.57746	108627.7099	130114.4908	130663.3385	130363.927
MTDL	671.3906087	751.9574817	770.7564187	894.0774457	3394.577818	5389.957612	72954.5752
BBCA	715.5549321	733.4438054	751.7799005	872.0646846	949.280219	1888.298394	5176.38054
CPIN	4599.876358	4714.873267	4597.001435	4528.046414	4867.305285	8333.976082	14694.5996
ULTJ	2489.995819	2552.245715	2488.439572	2451.112978	4432.410651	5641.239859	7803.64872

AQUA	11785.22254	12079.8531	11777.85677	11601.18892	21201.93736	75616.77304	65397.4834
INKP	1797.175427	1842.104812	1796.052192	1769.111409	1500.541779	1413.209487	17148.6346
SMCB	66206.94617	64551.77251	52937.9782	62743.90853	66717.98171	28029.15251	66092.1954
INTA	45118.48388	43990.52178	54548.24701	65457.89641	51449.47327	37231.31091	33378.9367
TSPC	43534.83795	42946.467	48453.61908	44144.3429	42314.92106	50663.33845	62084.6765
TGKA	33594.15307	32754.29924	28823.78333	34588.54	34632.29333	53899.57612	56566.1334
AUTO	4787.350814	4667.667044	4107.546998	4929.056398	3579.833279	4888.298394	8042.695
RMBA	36641.72084	35725.67782	31438.59648	37726.31577	34073.36817	38125.62668	38971.1511
PRAS	47325.91754	46142.7696	40605.63725	32484.5098	61338.96078	57822.70855	52234.204
DYNA	116424.1547	113513.5508	99891.9247	79913.53976	131381.1047	77507.19237	68295.9229
TINS	50075.85282	48823.9565	42965.08172	54372.06537	51503.52049	52353.97246	59858.8937
UNTR	79741.01635	92474.90938	109377.9203	135502.3362	150458.3604	127328.4237	142742.835
WICO	21768.9969	21768.9969	19156.71727	53253.73815	53206.42928	83580.05281	93259.584
DLTA	19981.88253	19981.88253	17584.05663	24770.60757	26040.14703	23304.13722	24610.0096
HDTX	36297.96612	36297.96612	27586.45425	28172.62157	39272.33921	52552.08672	53463.3781
IKAI	30732.98441	34420.94254	26159.91633	27974.32972	26715.68975	34766.09093	38148.9985
INDF	58440.17081	65452.99131	49744.2734	41785.18965	71018.00098	79224.86013	72922.2164
JPFA	33827.86924	37887.21354	28794.28229	24187.19713	27546.38856	56377.14084	60866.5862
MEDC	35326.38858	32565.55521	34749.82196	40789.85044	41637.81979	49610.89185	53921.2509
MYOR	74217.41619	83123.50613	63173.86466	53066.04631	59182.25051	55251.89259	58,652.771
TKIM	36334.77826	40694.95165	30928.16326	25979.65714	47580.22869	33887.24538	76,083.233

### Appendix 1g: Account Receivable

Firms	-3	-2	-1	0	1	2	3
ASGR	159,759.4 8	347,580.9 1	360,682.0 3	401,130.0 0	472,560.1 4	489,172.8 8	681,007.0 3
MTDL	12,076.18	70,816.38	190,862.9 1	242,689.6 8	241,155.7 9	276,872.5 4	290,326.0 4
BBCA	164,445.6 3	226,324.2 9	245,476.0 3	279,552.6 4	326,914.6 0	335,176.1 3	347,787.2 5
CPIN	58,595.57	55,915.19	57,763.15	55,702.40	59,799.43	67,177.16	91,000.55
ULTJ	9,067.75	12,068.42	13,640.62	15,963.07	17,366.84	58,898.75	62,082.57
AQUA	418,353.7 6	612,036.7 3	641,244.6 8	683,781.4 1	716,281.9 4	737,797.2 2	741,438.6 1
INKP	96,977.29	91,968.55	98,765.36	96,266.49	99,154.27	101,193.6 7	116,828.3 3
SMCB	25,931.68	22,231.16	20,336.59	24,839.12	28,722.74	38,127.44	49,364.51
INTA	15,000.85	23,620.07	29,179.41	75,593.83	69,592.21	72,384.77	74,251.64
TSPC	124,038.7 7	231,022.1 4	329,043.8 1	395,062.4 3	402,614.0 3	447,331.3 8	449,001.4 4
TGKA	8,183.87	11,660.84	59,673.49	70,886.95	71,784.77	83,332.95	81,908.06
AUTO	128,266.7	126,438.4	158,672.0	144,405.3	154,466.1	289,995.8	363,309.6



	5	5	4	0	1	0	8
RMBA	2,311.20	11,228.70	13,868.14	12,501.36	18,748.83	24,763.52	29,444.19
PRAS	26,390.27	47,857.23	44,375.44	75,451.61	74,681.38	79,986.35	86,013.18
DYNA	3,489.75	11,598.78	16,617.30	17,369.25	24,118.92	24,460.82	23,162.47
TINS	18,931.83	25,086.08	26,607.72	29,477.33	31,998.27	41,301.23	41,497.20
UNTR	12,657.01	25,949.73	26,223.71	41,029.13	55,109.72	55,426.80	62,107.00
WICO	7,857.00	8,564.91	11,669.27	20,033.65	22,247.84	26,859.49	32,183.21
DLTA	6,856.91	8,029.03	10,461.18	15,580.89	25,654.54	27,904.24	31,104.04
HDTX	2,311.20	11,228.70	13,868.14	12,501.36	18,748.83	24,763.52	29,444.19
IKAI	26,390.27	47,857.23	44,375.44	45,451.61	54,681.38	56,986.35	66,013.18
INDF	3,489.75	11,598.78	16,617.30	17,369.25	24,118.92	25,460.82	28,162.47
JPFA	18,931.83	45,086.08	26,607.72	49,477.33	41,998.27	51,301.23	59,720.00
MEDC	12,657.01	25,949.73	26,223.71	41,029.13	55,109.72	65,426.80	72,107.21
MYO R	7,857.00	8,564.91	11,669.27	19,033.65	22,247.84	26,859.49	28,347.25
TKIM	8,569.06	8,029.03	14,611.85	15,580.89	15,654.54	37,904.24	41,104.04

### Appendix 1h: Total Assets

Firms	-3	-2	-1	0	1	2	3
ASGR	720,898.3641	738,920.8232	702,542.0591	731,711.8396	781,406.7759	772,415.9306	812,325.8002
MTDL	29,928.9393	30,677.1628	24,291.1265	30,377.8734	39,432.9012	49,737.1001	59,386.1240
BBCA	16,699.4812	16,281.9942	13,678.4617	16,949.9734	19,942.7693	23,302.7281	30,022.4350
CPIN	37,553.2853	42,059.6796	38,158.9550	38,116.5846	42,664.3877	46,769.3817	52,071.2322
ULTJ	11,443.3289	12,816.5284	11,399.3505	21,614.9788	33,223.2466	48,217.6998	52,595.0368
AQUA	34,763.4508	38,935.0649	36,864.7373	44,241.9990	52,363.0952	56,400.3015	65,337.9790
INKP	23,282.8998	26,076.8478	29,119.1865	27,632.1433	33,778.2563	42,711.9108	43,719.8675
SMCB	74,376.2658	83,301.4177	81,846.6883	82,476.0633	85,421.5841	93,243.6922	94,562.4528
INTA	43,014.0059	48,175.6866	46,901.6694	46,131.7649	50,197.4023	57,922.6329	55,186.8229
TSPC	25,953.7615	29,068.2129	35,102.4192	36,343.0680	39,486.0321	40,730.5276	42,077.0383
TGKA	419,949.5981	470,343.5499	430,441.3517	426,248.8421	479,570.7354	484,990.5547	511,013.1688
AUTO	11,700.0157	13,104.0176	14,457.9107	18,755.1593	22,144.6450	26,938.6162	34,749.6367
RMBA	11,691.4111	11,983.6963	12,595.8864	19,820.7853	25,869.4810	28,017.3142	34,076.1885
PRAS	226,104.8874	231,757.5096	388,420.0515	489,928.1054	597,246.3522	785,603.0904	867,401.5637
DYNA	554,799.8436	568,669.8397	554,189.6808	665,759.8124	743,351.7447	743,779.7086	821,713.0907
TINS	31,160.8926	31,939.9150	31,953.0818	37,393.0712	45,624.6544	46,324.7845	49,291.2029
UNTR	130,076.9395	133,328.8629	140,826.6660	156,092.3274	164,661.3328	167,781.6492	169,253.9401
WICO	16,718.4946	17,136.4570	14,270.5930	19,393.4538	22,216.4744	31,369.3276	34,460.8081
DLTA	233,445.7222	239,281.8652	314,242.4399	370,797.0377	381,393.9519	414,347.2441	455,592.7110
HDTX	18,529.6378	18,992.8787	18,812.2773	21,494.3798	27,049.8218	34,814.6039	37,029.9563

IKAI	358,352.0968	367,310.8992	313,033.8914	341,568.8432	410,427.1131	414,552.1010	425,767.1083
INDF	55,479.9844	56,866.9840	85,021.5683	64,356.7819	70,202.5882	71,787.2820	89,184.7667
JPFA	30,228.8239	30,984.5445	32,316.5004	35,065.4357	39,779.8004	41,368.6151	56,452.2980
MEDC	278,065.5322	285,017.1705	284,141.0971	322,556.0174	496,931.6521	486,621.2921	506,447.4337
MYOR	30,806.2110	31,576.3663	15,886.7733	34,644.9688	39,064.1280	41,793.2744	55,303.7584
TKIM	36,041.1170	36,942.1449	34,722.5259	42,883.2894	49,667.0310	51,789.6801	51,429.7139

### Appendix 1i: Current Assets

Firms	-3	-2	-1	0	1	2	3
ASGR	540,673.7731	554,190.6174	526,906.5443	548,783.8797	586,055.0819	579,311.9479	609,244.3502
MTDL	22,446.7045	23,007.8721	18,218.3449	22,783.4050	29,574.6759	37,302.8251	44,539.5930
BBCA	12,524.6109	12,211.4956	10,258.8462	12,712.4801	14,957.0770	17,477.0461	22,516.8262
CPIN	28,164.9640	31,544.7597	28,619.2162	28,587.4385	31,998.2908	35,077.0363	39,053.4241
ULTJ	8,582.4967	9,612.3963	8,549.5129	16,211.2341	24,917.4349	36,163.2748	39,446.2776
AQUA	26,072.5881	29,201.2987	27,648.5529	33,181.4993	39,272.3214	42,300.2261	49,003.4843
INKP	17,462.1749	19,557.6359	21,839.3898	20,724.1075	25,333.6922	32,033.9331	32,789.9006
SMCB	55,782.1993	62,476.0633	61,385.0162	61,857.0475	64,066.1880	69,932.7691	70,921.8396
INTA	32,260.5044	36,131.7649	35,176.2521	34,598.8237	37,648.0518	43,441.9747	41,390.1172
TSPC	19,465.3212	21,801.1597	26,326.8144	27,257.3010	29,614.5241	30,547.8957	31,557.7787
TGKA	314,962.1986	352,757.6624	322,831.0138	319,686.6316	359,678.0516	363,742.9160	383,259.8766
AUTO	8,775.0118	9,828.0132	10,843.4330	14,066.3695	16,608.4838	20,203.9622	26,062.2275
RMBA	8,768.5583	8,987.7722	9,446.9148	14,865.5890	19,402.1108	21,012.9857	25,557.1414
PRAS	169,578.6656	173,818.1322	291,315.0386	367,446.0791	447,934.7642	589,202.3178	650,551.1728
DYNA	416,099.8827	426,502.3798	415,642.2606	499,319.8593	557,513.8085	557,834.7814	616,284.8180
TINS	23,370.6695	23,954.9362	23,964.8113	28,044.8034	34,218.4908	34,743.5883	36,968.4022
UNTR	97,557.7046	99,996.6472	105,619.9995	117,069.2455	123,495.9996	125,836.2369	126,940.4551
WICO	12,538.8710	12,852.3427	10,702.9447	14,545.0903	16,662.3558	23,526.9957	25,845.6061
DLTA	175,084.2916	179,461.3989	235,681.8299	278,097.7783	286,045.4640	310,760.4331	341,694.5332
HDTX	13,897.2283	14,244.6591	14,109.2080	16,120.7849	20,287.3664	26,110.9529	27,772.4672
IKAI	268,764.0726	275,483.1744	234,775.4185	256,176.6324	307,820.3348	310,914.0758	319,325.3312
INDF	41,609.9883	42,650.2380	63,766.1762	48,267.5864	52,651.9411	53,840.4615	66,888.5751
JPFA	22,671.6179	23,238.4083	24,237.3753	26,299.0768	29,834.8503	31,026.4613	42,339.2235
MEDC	208,549.1492	213,762.8779	213,105.8228	241,917.0130	372,698.7391	364,965.9690	379,835.5753
MYOR	23,104.6583	23,682.2747	11,915.0800	25,983.7266	29,298.0960	31,344.9558	41,477.8188
TKIM	27,030.8377	27,706.6087	26,041.8944	32,162.4670	37,250.2733	38,842.2600	38,572.2854

## Appendix 1j: Current Liability

	-3	-2	-1	0	1	2	3
ASGR	260,154.355	239,682.550	330,547.394	340,870.000	391,550.129	390,973.297	400,282.986
MTDL	12,711.935	17,382.088	28,585.205	36,757.227	38,719.824	52,114.720	52,910.991
BBCA	6,860.982	9,931.100	9,737.435	10,133.728	11,137.483	13,397.363	11,493.150
CPIN	41,373.740	39,371.696	33,912.366	27,945.174	33,099.998	42,456.762	44,322.280
ULTJ	12,965.292	11,889.673	8,741.995	14,194.119	20,400.833	22,785.587	23,644.950
AQUA	23,421.875	18,527.121	18,209.587	19,633.240	24,099.572	26,847.405	29,997.809
INKP	14,611.184	15,787.937	16,045.592	17,644.197	19,565.954	20,049.756	21,807.210
SMCB	11,161.521	16,511.640	14,337.511	19,223.670	20,069.232	23,749.958	24,768.509
INTA	8,753.350	9,300.316	10,497.460	9,990.003	14,256.049	18,712.143	19,844.524
TSPC	16,444.303	19,343.433	19,001.181	20,663.954	26,380.605	27,107.605	28,213.635
TGKA	13,321.381	17,574.551	20,769.733	20,250.434	22,900.178	26,232.226	27,259.151
AUTO	3,972.652	4,084.063	7,502.341	10,888.067	24,175.800	27,362.025	28,869.723
RMBA	1,723.314	4,021.526	6,826.846	8,200.716	12,181.446	33,452.466	33,908.267
PRAS	31,559.716	28,849.929	32,320.946	34,785.333	34,449.750	35,929.889	42,406.059
DYNA	103,747.571	136,647.643	166,851.248	121,933.910	150,004.298	226,000.811	227,797.410
TINS	7,660.905	9,150.512	12,604.868	13,439.713	15,577.584	18,378.927	22,289.462
UNTR	39,491.359	38,732.121	38,659.741	39,840.312	43,833.679	42,907.569	45,635.288
WICO	2,326.379	8,284.809	32,820.418	31,766.560	42,405.240	44,303.220	46,091.449
DLTA	28,118.537	28,612.195	30,022.696	32,459.648	32,013.217	37,949.769	41,421.026
HDTX	10,170.918	17,332.956	18,627.475	21,228.764	23,578.329	24,619.937	28,401.973
IKAI	19,513.359	34,088.821	35,406.490	36,645.146	35,798.282	38,424.921	40,892.431
INDF	11,793.364	13,771.572	14,639.513	17,756.566	19,222.680	19,034.505	26,869.528
JPFA	12,283.348	11,589.653	14,634.245	15,142.995	15,466.703	18,156.755	19,752.059
MEDC	32,626.655	23,718.927	25,423.042	29,274.058	31,651.061	35,984.741	37,782.911
MYOR	17,638.096	17,092.091	16,868.100	17,855.473	20,562.361	25,772.717	31,022.892
TKIM	13,019.924	14,749.895	18,953.652	22,895.982	24,261.820	26,347.333	29,306.318

## Appendix 1k: Liquid Assets

	-3	-2	-1	0	1	2	3
ASGR	51,536.728	50,248.310	51,504.518	59,745.240	71,562.970	71,864.836	71,700.160
MTDL	369.265	413.577	423.916	491.743	1,867.018	2,964.477	40,125.016
BBCA	393.555	403.394	413.479	479.636	522.104	1,038.564	2,847.009
CPIN	2,529.932	2,593.180	2,528.351	2,490.426	2,677.018	4,583.687	8,082.030
ULTJ	1,369.498	1,403.735	1,368.642	1,348.112	2,437.826	3,102.682	4,292.007
AQUA	6,481.872	6,643.919	6,477.821	6,380.654	11,661.066	41,589.225	35,968.616
INKP	988.446	1,013.158	987.829	973.011	825.298	777.265	9,431.749
SMCB	36,413.820	35,503.475	29,115.888	34,509.150	36,694.890	15,416.034	36,350.707
INTA	24,815.166	24,194.787	30,001.536	36,001.843	28,297.210	20,477.221	18,358.415
TSPC	23,944.161	23,620.557	26,649.490	24,279.389	23,273.207	27,864.836	34,146.572
TGKA	18,476.784	18,014.865	15,853.081	19,023.697	19,047.761	29,644.767	31,111.373
AUTO	2,633.043	2,567.217	2,259.151	2,710.981	1,968.908	2,688.564	4,423.482
RMBA	20,152.946	19,649.123	17,291.228	20,749.474	18,740.352	20,969.095	21,434.133
PRAS	26,029.255	25,378.523	22,333.100	17,866.480	33,736.428	31,802.490	28,728.812
DYNA	64,033.285	62,432.453	54,940.559	43,952.447	72,259.608	42,628.956	37,562.758
TINS	27,541.719	26,853.176	23,630.795	29,904.636	28,326.936	28,794.685	32,922.392
UNTR	43,857.559	50,861.200	60,157.856	74,526.285	82,752.098	70,030.633	78,508.559
WICO	11,972.948	11,972.948	10,536.194	29,289.556	29,263.536	45,969.029	51,292.771
DLTA	10,990.035	10,990.035	9,671.231	13,623.834	14,322.081	12,817.275	13,535.505
HDTX	19,963.881	19,963.881	15,172.550	15,494.942	21,599.787	28,903.648	29,404.858
IKAI	16,903.141	18,931.518	14,387.954	15,385.881	14,693.629	19,121.350	20,981.949
INDF	32,142.094	35,999.145	27,359.350	22,981.854	39,059.901	43,573.673	40,107.219
JPFA	18,605.328	20,837.967	15,836.855	13,302.958	15,150.514	31,007.427	33,476.622
MEDC	19,429.514	17,911.055	19,112.402	22,434.418	22,900.801	27,285.991	29,656.688
MYOR	40,819.579	45,717.928	34,745.626	29,186.325	32,550.238	30,388.541	32,259.024
TKIM	19,984.128	22,382.223	17,010.490	14,288.811	26,169.126	18,637.985	41,845.778

## Appendix 2: Variable Data

### Appendix 2a: WGTO

	PreAVG	-3	-2	-1		PreAVG	1	2	3
ASGR	5.411912	5.047941	4.769962	6.417833		5.49818	5.471407	5.440398	5.582735
MTDL	47.96166	34.42498	42.0287	67.43129		13.21242	20.73886	17.57974	1.318653
BBCA	21.8674	17.43334	24.61885	23.55001		12.75624	21.33192	12.89989	4.036921
CPIN	14.98311	16.3537	15.18278	13.41284		9.037045	12.3645	9.262579	5.484053
ULTJ	8.108188	9.467188	8.470026	6.387351		7.073785	8.368454	7.343836	5.509066
AQUA	3.071031	3.613443	2.788583	2.811067		1.182069	2.06667	0.645538	0.834
INKP	15.53605	14.78197	15.5829	16.24329		17.2717	23.70774	25.79526	2.312107
SMCB	0.42134	0.306519	0.465071	0.492429		0.922966	0.546922	1.540601	0.681376
INTA	0.362344	0.352742	0.384393	0.349897		0.83285	0.503797	0.913803	1.08095
TSPC	0.739568	0.686777	0.818924	0.713004		0.977531	1.133518	0.972825	0.826251
TGKA	1.002225	0.720979	0.975558	1.310139		0.987772	1.20225	0.884886	0.87618
AUTO	2.140163	1.508768	1.590852	3.320868		9.660814	12.27878	10.17719	6.52647
RMBA	0.228331	0.085512	0.204667	0.394816		1.27577	0.650012	1.595322	1.581975
PRAS	1.265493	1.212471	1.136785	1.447222		1.209002	1.021144	1.129782	1.476081
DYNA	2.281961	1.620213	2.188728	3.036941		4.480645	2.075908	5.30158	6.064449
TINS	0.384109	0.278156	0.340761	0.533409		0.621742	0.549921	0.638275	0.67703
UNTR	0.768203	0.900446	0.761526	0.642638		0.574558	0.529699	0.612697	0.581278
WICO	1.33376	0.194303	0.691961	3.115016		1.103813	1.449081	0.963762	0.898595
DLTA	2.755449	2.558548	2.603467	3.10433		2.75208	2.235235	2.96083	3.060176
HDTX	0.868464	0.509466	0.868216	1.227709		0.969762	1.0916	0.851793	0.965894
IKAI	1.805301	1.154422	1.800638	2.460843		2.131592	2.436313	2.00953	1.948934
INDF	0.428183	0.366913	0.382553	0.535083		0.53297	0.492133	0.436835	0.669942
JPFA	0.713483	0.660206	0.55618	0.924063		0.732152	1.02087	0.585561	0.590025
MEDC	1.44456	1.679232	1.324262	1.330186		1.324968	1.382094	1.318799	1.27401
MYOR	0.430478	0.432099	0.37386	0.485474		0.813833	0.631712	0.848106	0.961681
TKIM	0.808249	0.651513	0.659	1.114233		1.013698	0.927116	1.413636	0.700341

## Appendix 2b: ARTO

	PreAVG	-3	-2	-1		PreAVG	1	2	3
ASGR	6.534216	9.869168	4.179233	5.554248		4.475973	5.021649	4.843963	3.562309
MTDL	2.924983	6.379668	1.487594	0.907686		1.072793	0.973087	1.140766	1.104526
BBCA	0.25307	0.25286	0.265939	0.240409		0.216336	0.206476	0.242249	0.200282
CPIN	4.034981	4.279333	4.267469	3.558142		3.378957	3.354648	3.830375	2.951849
ULTJ	6.173522	8.665607	5.970841	3.884119		3.924088	7.119395	2.344608	2.30826
AQUA	0.231625	0.339308	0.183462	0.172105		0.223218	0.203911	0.220537	0.245206
INKP	0.979383	0.913127	1.040404	0.984617		1.176002	1.19593	1.200803	1.131274
SMCB	3.794254	2.608608	4.501364	4.272791		3.683596	4.234683	3.775211	3.040893
INTA	2.701061	3.536506	2.386341	2.180338		1.476002	1.241523	1.566724	1.61976
TSPC	0.553637	0.803478	0.507453	0.34998		0.381734	0.397111	0.367264	0.380827
TGKA	7.036281	9.865215	9.134195	2.109432		1.952731	1.933404	1.907807	2.016981
AUTO	0.223343	0.187708	0.195762	0.286558		0.66733	0.948558	0.571837	0.481595
RMBA	3.224345	4.519003	2.170587	2.983445		6.368093	3.937683	8.187132	6.979463
PRAS	5.105192	7.247786	3.653535	4.414256		2.83537	2.795695	2.722426	2.987989
DYNA	104.1439	180.177	71.40124	60.85345		51.09782	37.69311	55.99575	59.60462
TINS	2.511418	2.452469	2.210694	2.871089		2.967585	2.95046	2.696952	3.255344
UNTR	12.29682	18.9098	9.045956	8.934717		4.655161	4.820541	4.691699	4.453242
WICO	8.234216	1.794484	5.862403	17.04576		10.07604	11.55175	9.996631	8.679747
DLTA	21.28135	24.8531	21.59754	17.39342		7.958688	7.562775	8.242424	8.070865
HDTX	14.72226	26.67094	9.355329	8.140516		6.497767	7.621754	6.025465	5.846083
IKAI	4.544651	4.481303	4.316984	4.835666		3.936186	3.9677	4.086563	3.754294
INDF	11.00553	20.48138	7.195934	5.339275		5.04785	4.830278	4.530908	5.782362
JPFA	2.941164	3.932242	1.557916	3.333333		2.127149	2.23194	2.144996	2.004512
MEDC	9.012635	15.62274	5.539598	5.875562		3.32992	3.480776	3.333333	3.175651
MYOR	11.48687	13.60539	12.09451	8.760692		6.0165	5.60146	5.815386	6.632654
TKIM	9.401261	9.208548	11.13376	7.861471		5.975572	9.39289	4.212742	4.321085

## Appendix 2c: FATO

	PreAVG	-3	-2	-1		PreAVG	1	2	3
ASGR	2.334839	2.187123	1.965869	2.851527		3.030333	3.03687	3.067693	2.986434
MTDL	4.380053	2.574165	3.43402	7.131973		5.900376	5.95101	6.350326	5.399791
BBCA	3.500353	2.49	3.696629	4.31443		3.063066	3.38468	3.484405	2.320114
CPIN	5.912199	6.677177	5.67328	5.38614		5.120804	4.701955	5.501756	5.1587
ULTJ	5.712259	6.866667	5.62232	4.64779		3.103385	3.721533	2.863979	2.724644
AQUA	3.32031	4.083333	2.883919	2.993677		2.818934	2.789331	2.884941	2.78253
INKP	3.604082	3.803333	3.669326	3.339586		3.126181	3.510588	2.84496	3.022994
SMCB	1.057493	0.909505	1.201307	1.061668		1.518342	1.423899	1.543688	1.58744
INTA	1.25327	1.233333	1.17	1.356476		1.952812	1.72121	1.957904	2.179322
TSPC	3.717892	3.84	4.033028	3.280648		4.048805	4.049089	4.033547	4.063778
TGKA	0.237048	0.192251	0.226457	0.292437		0.313501	0.289402	0.327807	0.323293
AUTO	2.363872	2.057833	1.888879	3.144903		5.935822	6.616498	6.155864	5.035104
RMBA	2.070653	0.893333	2.033837	3.284788		5.373628	2.853824	7.236319	6.03074
PRAS	0.701565	0.845939	0.754444	0.504311		0.307687	0.349582	0.277184	0.296295
DYNA	1.471446	1.133333	1.456324	1.824682		1.581559	1.222997	1.841542	1.680137
TINS	1.872368	1.49	1.736312	2.390791		2.404787	2.069267	2.404489	2.740604
UNTR	1.754789	1.84	1.76061	1.663758		1.599123	1.613364	1.549907	1.634098
WICO	5.903989	0.843333	2.930067	13.93857		9.411198	11.56806	8.559455	8.106081
DLTA	0.677909	0.73	0.724699	0.57903		0.53827	0.508712	0.555087	0.551011
HDTX	4.952888	3.326667	5.530927	6.00107		4.739062	5.282806	4.285895	4.648484
IKAI	0.525994	0.330018	0.562463	0.6855		0.557488	0.528618	0.561759	0.582086
INDF	1.26652	1.288301	1.467707	1.043551		1.697471	1.659498	1.606979	1.825935
JPFA	2.49138	2.4627	2.266947	2.744492		2.378988	2.356412	2.66001	2.120542
MEDC	0.585913	0.711118	0.504359	0.542262		0.428778	0.386018	0.448171	0.452144
MYOR	4.395179	3.47	3.280569	6.43497		3.442425	3.190148	3.737402	3.399724
TKIM	2.639157	2.189406	2.419819	3.308245		3.165776	2.960542	3.083255	3.45353

## Appendix 2d: TATO

	PreAVG	-3	-2	-1		PreAVG	1	2	3
ASGR	0.700452	0.656137	0.589761	0.855458		0.9091	0.911061	0.920308	0.89593
MTDL	1.314016	0.77225	1.030206	2.139592		1.770113	1.785303	1.905098	1.619937
BBCA	1.050106	0.747	1.108989	1.294329		0.91892	1.015404	1.045321	0.696034
CPIN	1.77366	2.003153	1.701984	1.615842		1.536241	1.410587	1.650527	1.54761
ULTJ	1.713678	2.06	1.686696	1.394337		0.931016	1.11646	0.859194	0.817393
AQUA	0.996093	1.225	0.865176	0.898103		0.84568	0.836799	0.865482	0.834759
INKP	1.081225	1.141	1.100798	1.001876		0.937854	1.053176	0.853488	0.906898
SMCB	0.317248	0.272851	0.360392	0.3185		0.455503	0.42717	0.463106	0.476232
INTA	0.375981	0.37	0.351	0.406943		0.585844	0.516363	0.587371	0.653797
TSPC	1.115368	1.152	1.209908	0.984194		1.214641	1.214727	1.210064	1.219133
TGKA	0.071114	0.057675	0.067937	0.087731		0.09405	0.086821	0.098342	0.096988
AUTO	0.709161	0.61735	0.566664	0.943471		1.780747	1.984949	1.846759	1.510531
RMBA	0.621196	0.268	0.610151	0.985437		1.612088	0.856147	2.170896	1.809222
PRAS	0.210469	0.253782	0.226333	0.151293		0.092306	0.104874	0.083155	0.088888
DYNA	0.441434	0.34	0.436897	0.547404		0.474468	0.366899	0.552463	0.504041
TINS	0.56171	0.447	0.520894	0.717237		0.721436	0.62078	0.721347	0.822181
UNTR	0.526437	0.552	0.528183	0.499127		0.479737	0.484009	0.464972	0.490229
WICO	1.771197	0.253	0.87902	4.18157		2.823359	3.470417	2.567837	2.431824
DLTA	0.203373	0.219	0.21741	0.173709		0.161481	0.152613	0.166526	0.165303
HDTX	1.485866	0.998	1.659278	1.800321		1.421719	1.584842	1.285769	1.394545
IKAI	0.157798	0.099006	0.168739	0.20565		0.167246	0.158585	0.168528	0.174626
INDF	0.379956	0.38649	0.440312	0.313065		0.509241	0.49785	0.482094	0.547781
JPFA	0.747414	0.73881	0.680084	0.823348		0.713696	0.706924	0.798003	0.636163
MEDC	0.175774	0.213335	0.151308	0.162679		0.128633	0.115805	0.134451	0.135643
MYOR	1.318554	1.041	0.984171	1.930491		1.032728	0.957045	1.121221	1.019917
TKIM	0.791747	0.656822	0.725946	0.992473		0.949733	0.888163	0.924977	1.036059



## Appendix 2f: CR

	PreAVG	-3	-2	-1	PreAVG	1	2	3
ASGR	1.994836	2.078281	2.312186	1.594042	1.500169	1.496756	1.481717	1.522034
MTDL	1.242262	1.765798	1.323654	0.637335	0.773793	0.763812	0.715783	0.841783
BBCA	1.369551	1.825484	1.229622	1.053547	1.535538	1.34295	1.304514	1.959152
CPIN	0.775289	0.680745	0.801204	0.843917	0.891341	0.966716	0.826183	0.881124
ULTJ	0.816136	0.661959	0.808466	0.977982	1.49226	1.221393	1.587112	1.668275
AQUA	1.402554	1.113173	1.576138	1.518351	1.612911	1.629586	1.57558	1.633569
INKP	1.264993	1.195124	1.238771	1.361083	1.465378	1.294784	1.597722	1.503627
SMCB	4.354303	4.997724	3.783759	4.281428	3.000063	3.192259	2.944543	2.863388
INTA	3.640479	3.685504	3.885004	3.35093	2.349387	2.640848	2.321593	2.08572
TSPC	1.232102	1.183712	1.127057	1.385536	1.122676	1.122587	1.126912	1.118529
TGKA	19.75292	23.64336	20.07207	15.54334	14.54416	15.70634	13.86626	14.05986
AUTO	2.020208	2.208855	2.40643	1.44534	0.776045	0.686988	0.738394	0.902753
RMBA	2.9023	5.088195	2.234916	1.383789	0.991539	1.592759	0.628145	0.753714
PRAS	6.803789	5.373263	6.024907	9.013197	14.91407	13.00255	16.39867	15.341
DYNA	3.207658	4.010695	3.121184	2.491095	2.963449	3.716652	2.468287	2.705407
TINS	2.523252	3.050641	2.617879	1.901235	1.915204	2.196649	1.890403	1.65856
UNTR	2.594716	2.470356	2.58175	2.732041	2.843912	2.817377	2.932728	2.781629
WICO	2.422429	5.389867	1.551314	0.326106	0.494908	0.392932	0.531045	0.560746
DLTA	6.782991	6.22665	6.2722	7.850122	8.457754	8.93523	8.188731	8.249301
HDTX	0.981878	1.366369	0.821825	0.757441	0.966274	0.860424	1.060561	0.977836
IKAI	9.495177	13.77334	8.081335	6.630858	8.166375	8.598746	8.09147	7.808911
INDF	3.66033	3.528254	3.096977	4.355758	2.68567	2.739053	2.828572	2.489384
JPFA	1.835676	1.84572	2.0051	1.65621	1.927106	1.928973	1.708811	2.143535
MEDC	7.928903	6.391987	9.012334	8.382389	10.65686	11.77524	10.14224	10.05311
MYOR	1.133955	1.309929	1.385569	0.706368	1.326018	1.424841	1.216207	1.337007
TKIM	1.776173	2.076113	1.878428	1.373978	1.44192	1.535345	1.474239	1.316176

## Appendix 2g: ACR

Firms	PreAVG	-3	-2	-1	PreAVG	1	2	3
ASGR	0.76524 7	0.78162 2	0.93996 2	0.57415 7	0.30954 6	0.30045 4	0.27859 7	0.34958 8
MTDL	1.09461 4	1.57566 1	1.16791 6	0.54026 6	-1.1101	0.44819 9	0.34345 3	-4.12196
BBCA	1.06312 9	1.45002 8	0.96375	0.77560 9	0.72365 8	1.03611 1	0.79711	0.33775 4
CPIN	0.33550 4	0.28050 2	0.37009 4	0.35591 8	0.08148 3	0.43734 1	0.11952 7	-0.31242
ULTJ	-0.0135	-0.02942	0.03568 7	-0.04677	0.53840 4	0.43923 5	0.69582 6	0.48015 1
AQUA	-0.75982	-0.69825	-0.7711	-0.81011	-5.43874	-1.53756	-8.56396	-6.2147
INKP	0.84305 8	0.75232 4	0.81873	0.95812	0.34511 6	1.01869 5	1.34397 5	-1.32732
SMCB	-11.8858	-16.3564	-10.2903	-9.01075	-5.60749	-8.77555	-1.30409	-6.74284
INTA	-14.4564	-14.8704	-13.143	-15.3559	-6.38741	-10.3514	-4.84128	-3.96956
TSPC	-7.66908	-8.34697	-6.8657	-7.79458	-5.68553	-4.65187	-5.60138	-6.80334
TGKA	12.8249 2	14.5648	13.3626 3	10.5473 4	7.77357 7	10.2620 1	6.46931 2	6.58941 3
AUTO	-1.45436	-2.12942	-1.708	-0.52567	0.04966 9	0.15391 8	0.09524 5	-0.10016
RMBA	-38.799	-71.4563	-29.7461	-15.1947	-5.11185	-8.47699	-3.47476	-3.38381
PRAS	1.57742 9	-0.02518	0.26704 3	4.49042 4	9.36813 2	6.59263 2	10.6051 1	10.9066 5
DYNA	0.14576 4	-0.02918	0.13065 4	0.33581 6	1.14111 7	0.56359 6	1.23366 3	1.62609 2
TINS	-15.8137	-20.4809	-16.5905	-10.3698	-8.69324	-9.70588	-8.36451	-8.00933
UNTR	-6.08848	-4.79877	-6.01343	-7.45324	-8.58956	-9.53956	-7.75029	-8.47883
WICO	-12.66	-28.297	-7.90797	-1.77515	-5.70264	-4.12404	-6.26052	-6.72335
DLTA	4.38936	3.66838 1	3.75807	5.74163	6.03178 6	6.00692 3	5.97804 8	6.11038 7
HDTX	-7.59082	-11.4813	-6.71715	-4.574	-5.85276	-5.13578	-6.62376	-5.79874
IKAI	5.50690 5	8.10344	4.44626 1	3.97101 5	5.06560 5	5.91212 3	4.83426 2	4.45043 1
INDF	-12.0669	-14.311	-14.013	-7.87685	-9.99905	-10.5611	-12.1552	-7.28079
JPFA	-7.75306	-8.06854	-9.7635	-5.42714	-7.63397	-4.48267	-9.46927	-8.94998
MEDC	3.34179 9	2.4941	4.06961 4	3.46168 1	5.71127 2	7.03934	5.17905	4.91542 5
MYO	-14.2455	-13.8381	-16.1222	-12.7762	-6.96913	-8.93662	-6.50152	-5.46926
TKIM	-6.84161	-7.97043	-8.05397	-4.50043	-5.57019	-5.52467	-3.15599	-8.02992

## Appendix 2h: Liquity

Firms	PreAV G	-3	-2	-1	PreAV G	1	2	3
ASGR	0.09457 9	0.09531 9	0.09067 9	0.09774 9	0.12128 3	0.12211 2	0.12405 2	0.11768 7
MTD L	0.01923 2	0.01645 1	0.01797 5	0.02326 9	0.34782 8	0.06312 9	0.07947 1	0.90088 4
BBCA	0.03492	0.03142 3	0.03303 4	0.04030 5	0.07359	0.03490 7	0.05942 4	0.12643 9
CPIN	0.08679 2	0.08982 6	0.08220 6	0.08834 5	0.14042 8	0.08366 1	0.13067 5	0.20694 8
ULTJ	0.15522 9	0.15956 9	0.14603 4	0.16008 4	0.09748	0.09783 6	0.08579 6	0.10880 6
AQU A	0.23680 7	0.24860 9	0.22752 1	0.23429 2	0.67137 4	0.29692 8	0.98319 2	0.73400 1
INKP	0.05121 3	0.05660 5	0.05180 4	0.04523 2	0.11482 8	0.03257 7	0.02426 4	0.28764 2
SMC B	0.56512 5	0.65278 6	0.56827 3	0.47431 6	0.43525 1	0.57276 5	0.22044 1	0.51254 6
INTA	0.76391	0.76921 2	0.66962 6	0.85289 2	0.55551 3	0.75162 5	0.47136 9	0.44354 6
TSPC	1.10860 1	1.23009 3	1.08345 4	1.01225 7	0.92669 1	0.78587 1	0.91216 9	1.08203 3
TGK A	0.05294 6	0.05866 3	0.05106 9	0.04910 6	0.07187 8	0.05295 8	0.08149 9	0.08117 6
AUT O	0.25653 9	0.30006 1	0.26121 4	0.20834 3	0.14044 9	0.11854 8	0.13307 1	0.16972 8
RMB A	2.10496 1	2.29831 9	2.18620 6	1.83035 7	0.93416	0.96589 2	0.99791 1	0.83867 5
PRAS	0.12538 8	0.15349 4	0.14600 6	0.07666 3	0.05781 7	0.07531 5	0.05397 5	0.04416 1
DYN A	0.14415 1	0.15388 9	0.14638 2	0.13218 2	0.08899 3	0.12961 9	0.07641 9	0.06095
TINS	1.09517 4	1.17847 4	1.12098 7	0.98606 2	0.84905 2	0.82782 5	0.82877 7	0.89055 5
UNTR	0.50925 1	0.44955 5	0.50862 9	0.56956 9	0.61502 3	0.67007 9	0.55652 2	0.61846 8
WICO	0.95695 5	0.95486 7	0.93157 7	0.98442	1.89824 5	1.75626 6	1.95388 4	1.98458 4
DLTA	0.05501 5	0.06277	0.06123 9	0.04103 5	0.04364 2	0.05006 9	0.04124 5	0.03961 3
HDT X	1.30446 7	1.43653 7	1.40149 9	1.07536 5	1.07680 8	1.06469 2	1.10695 5	1.05877 7
IKAI	0.06429 9	0.06289 2	0.06872 1	0.06128 4	0.05831 4	0.04773 4	0.0615	0.06570 7
INDF	0.68185 8	0.77246 1	0.84405 5	0.42905 7	0.71692 5	0.74185 1	0.80931 1	0.59961 2
JPFA	0.79025 1	0.82064 4	0.89670 4	0.65340 6	0.76595 8	0.50781 3	0.99938 7	0.79067 6
MED C	0.08888	0.09316 5	0.08378 9	0.08968 5	0.07142 9	0.06144 6	0.07476 3	0.07807 8
MYO R	2.20443 3	1.76672 5	1.93047	2.91610 5	0.95274 4	1.11100 2	0.96948 7	0.77774 2
TKIM	0.73344 5	0.73930 8	0.80783	0.65319 7	0.75574 2	0.70252 2	0.47983 8	1.08486 6

### Appendix 3: Sample Description

**Appendix 3a: Mean of Independent Variables with no ERP adoption, before and after Comparison of Resource Management Efficiency**

Variables	PreAVG	t-3	t-2	t-1	Total
WGTO	5.27388523	4.50007091	5.060354483	6.261230298	5.27388523
t Before Com	2.609(0.015)	2.871(0.008)	2.686(0.013)	2.335(0.028)	4.402(.000)
t After Com		0.441(0.663 <sup>x</sup> )	-0.553(0.585 <sup>x</sup> )	-1.535(0.137)	
ARTO	9.821229778	14.6791077	7.740617406	7.043964226	9.821229778
t Before Com	2.517(0.019)	2.163(0.040)	2.851(0.009)	3.03(0.006)	3.845(0.000)
t After Com		1.729(0.096 <sup>*</sup> )	-2.377(0.025)	-2.81(0.009)	
FATO	2.642439215	2.24880267	2.419004473	3.2595105	2.642439215
t Before Com	7.668(.000)	6.566(.000)	7.796(0.000)	5.72(.000)	10.718(0.000)
t After Com		1.495(0.147)	1.769(0.089 <sup>*</sup> )	-1.161(0.257 <sup>x</sup> )	
TATO	0.792731765	0.6746408	0.725701342	0.97785315	0.792731765
t Before Com	7.668(.000)	6.566(.000)	7.796(0.000)	5.72(0.000)	10.718(0.000)
t After Com		1.495(.147 <sup>**</sup> )	1.769(.089)	-1.161(0.257 <sup>x</sup> )	
ACR	4.854250669	-7.28910725	-4.514441803	-2.75920296	-4.85425067
t Before Com	4.569(0.000)	-2.307(0.030)	-2.605(0.015)	-2.152(0.041)	3.803(0.000)
t After Com		2.075(0.048)	2.14(0.042)	0.696(0.493)	
LIQUITY	0.549400894	0.56352757	0.554499113	0.530176003	0.549400894
t Before Com	4.545(0.000)	4.704(.000)	4.662(0.000)	4.045(0.000)	7.812(0.000)
t After Com		-1.609(0.120)	-0.993(0.330 <sup>x</sup> )	-0.028(0.978 <sup>x</sup> )	

\*\* Significant at 25% confidence level, \* at 10% <sup>x</sup> not significant

**Appendix 3b: Mean of Independent Variables with ERP adoption, before and after Comparison of Resource Management Efficiency**

Variables	PreAVG	t-3	t-2	t-1	Total
WGTO	2.370906035	2.5628404	1.997622502	2.552255204	3.805767822
	4.094(0.000)	3.472(0.002)	3.592(0.001)	5.557(0.000)	5.962(0.000)
ARTO	5.443017994	5.20266084	5.56517504	5.5612181	5.443017994
	2.878(0.008)	3.664(0.001)	2.677(0.013)	2.514(0.019)	4.936(0.000)
FATO	2.983022951	2.99022745	3.070166277	2.88867513	2.983022951
	7.077(0.000)	6.199(0.000)	7.093(0.000)	7.532(0.000)	12.034(0.000)

TATO	0.894906885	0.89706823	0.921049883	0.866602539	0.894906885
	7.078(0.000)	6.211(0.000)	7.08(0.000)	7.622(0.000)	11.134(0.000)
ACR	-1.969704368	-1.98435128	-1.772823093	-2.15193873	-1.96970437
	-1.822(0.08*)	-1.667(0.108**)	-1.59(0.124)	-2.01(0.055*)	-3.068(0.003)
LIQUITY	0.483901694	0.45096283	0.473669148	0.527073103	0.483901694
	5.377(0.000)	5.033(0.000)	4.854(0.000)	5.637(0.000)	9.05(0.000)

\*\* Significant at 25% confidence level, \* at 10% x not significant



#### Appendix 4: One Sample t test Data for t-3 to t-1

	PreAVG	t-3	DEffWGTO3	t-2	DEffWGTO2	t-1	DEffWGTO1
WGTO	5.411912	5.047941	0.423466063	4.769962	-0.8350981	6.417833	-0.8350981
	47.96166	34.42498	-13.6861203	42.0287	-66.11263692	67.43129	-66.11263692
	21.8674	17.43334	3.898578403	24.61885	-19.51309393	23.55001	-19.51309393
	14.98311	16.3537	-3.98919253	15.18278	-7.928787464	13.41284	-7.928787464
	8.108188	9.467188	-1.0987339	8.470026	-0.878284354	6.387351	-0.878284354
	3.071031	3.613443	-1.54677296	2.788583	-1.977067104	2.811067	-1.977067104
	15.53605	14.78197	8.925777268	15.5829	-13.93118764	16.24329	-13.93118764
	0.42134	0.306519	0.240402881	0.465071	0.188947121	0.492429	0.188947121
	0.362344	0.352742	0.151055013	0.384393	0.731052308	0.349897	0.731052308
	0.739568	0.686777	0.446741088	0.818924	0.113247322	0.713004	0.113247322
	1.002225	0.720979	0.48127095	0.975558	-0.433958977	1.310139	-0.433958977
	2.140163	1.508768	10.77001592	1.590852	3.20560227	3.320868	3.20560227
	0.228331	0.085512	0.564499835	0.204667	1.187159645	0.394816	1.187159645
	1.265493	1.212471	-0.19132704	1.136785	0.028859559	1.447222	0.028859559
	2.281961	1.620213	0.455694858	2.188728	3.027507287	3.036941	3.027507287
	0.384109	0.278156	0.271764834	0.340761	0.143621924	0.533409	0.143621924
	0.768203	0.900446	-0.37074719	0.761526	-0.061360413	0.642638	-0.061360413
	1.33376	0.194303	1.254778313	0.691961	-2.21642098	3.115016	-2.21642098
	2.755449	2.558548	-0.32331337	2.603467	-0.044154491	3.10433	-0.044154491
	0.868464	0.509466	0.582134131	0.868216	-0.261815043	1.227709	-0.261815043
	1.805301	1.154422	1.281891068	1.800638	-0.51190876	2.460843	-0.51190876
	0.428183	0.366913	0.125219983	0.382553	0.134859819	0.535083	0.134859819
	0.713483	0.660206	0.360663951	0.55618	-0.334037083	0.924063	-0.334037083
	1.44456	1.679232	-0.29713763	1.324262	-0.056175803	1.330186	-0.056175803
	0.430478	0.432099	0.199612608	0.37386	0.476207004	0.485474	0.476207004
	0.808249	0.651513	0.27560291	0.659	-0.413892061	1.114233	-0.413892061

	PreAVG	t-3	DEffWGTO3	t-2	DEffWGTO2	t-1	DEffWGTO1
ARTO	6.534216	9.869168	-4.84751896	4.179233	-1.991939326	5.554248	-1.991939326
	2.924983	6.379668	-5.4065808	1.487594	0.196839657	0.907686	0.196839657
	0.25307	0.25286	-0.0463843	0.265939	-0.040127654	0.240409	-0.040127654
	4.034981	4.279333	-0.92468478	4.267469	-0.606292917	3.558142	-0.606292917
	6.173522	8.665607	-1.54621204	5.970841	-1.575858662	3.884119	-1.575858662
	0.231625	0.339308	-0.13539661	0.183462	0.073101044	0.172105	0.073101044
	0.979383	0.913127	0.282802268	1.040404	0.146657793	0.984617	0.146657793
	3.794254	2.608608	1.626074591	4.501364	-1.231898777	4.272791	-1.231898777
	2.701061	3.536506	-2.29498337	2.386341	-0.560577391	2.180338	-0.560577391
	0.553637	0.803478	-0.40636721	0.507453	0.030846915	0.34998	0.030846915
	7.036281	9.865215	-7.93181125	9.134195	-0.092451404	2.109432	-0.092451404
	0.223343	0.187708	0.760849731	0.195762	0.195036766	0.286558	0.195036766
	3.224345	4.519003	-0.58131968	2.170587	3.996018401	2.983445	3.996018401
	5.105192	7.247786	-4.4520908	3.653535	-1.426266904	4.414256	-1.426266904
	104.1439	180.177	-142.483923	71.40124	-1.248827092	60.85345	-1.248827092
	2.511418	2.452469	0.497990294	2.210694	0.384254203	2.871089	0.384254203
	12.29682	18.9098	-14.0892553	9.045956	-4.481475361	8.934717	-4.481475361
	8.234216	1.794484	9.757265863	5.862403	-8.366013504	17.04576	-8.366013504
	21.28135	24.8531	-17.2903242	21.59754	-9.322550207	17.39342	-9.322550207
	14.72226	26.67094	-19.0491884	9.355329	-2.294433518	8.140516	-2.294433518
	4.544651	4.481303	-0.51360313	4.316984	-1.081371633	4.835666	-1.081371633
	11.00553	20.48138	-15.6511001	7.195934	0.443086816	5.339275	0.443086816
	2.941164	3.932242	-1.70030254	1.557916	-1.328821439	3.333333	-1.328821439
	9.012635	15.62274	-12.1419678	5.539598	-2.699910614	5.875562	-2.699910614
	11.48687	13.60539	-8.00392901	12.09451	-2.128038276	8.760692	-2.128038276
	9.401261	9.208548	0.184342105	11.13376	-3.540386203	7.861471	-3.540386203

	PreAVG	t-3	DEffWGTO3	t-2	DEffWGTO2	t-1	DEffWGTO1
FATO	2.334839	2.187123	0.849747829	1.965869	0.134907277	2.851527	0.134907277
	4.380053	2.574165	3.376845138	3.43402	-1.732182077	7.131973	-1.732182077
	3.500353	2.49	0.894680086	3.696629	-1.994315985	4.31443	-1.994315985
	5.912199	6.677177	-1.97522169	5.67328	-0.227440186	5.38614	-0.227440186
	5.712259	6.866667	-3.1451336	5.62232	-1.923146443	4.64779	-1.923146443
	3.32031	4.083333	-1.29400218	2.883919	-0.211147241	2.993677	-0.211147241
	3.604082	3.803333	-0.29274542	3.669326	-0.316591289	3.339586	-0.316591289
	1.057493	0.909505	0.514394014	1.201307	0.525771535	1.061668	0.525771535
	1.25327	1.233333	0.487877155	1.17	0.822846136	1.356476	0.822846136
	3.717892	3.84	0.20908888	4.033028	0.783129824	3.280648	0.783129824
	0.237048	0.192251	0.097151683	0.226457	0.030855547	0.292437	0.030855547
	2.363872	2.057833	4.558665216	1.888879	1.890200254	3.144903	1.890200254
	2.070653	0.893333	1.960490762	2.033837	2.745951941	3.284788	2.745951941
	0.701565	0.845939	-0.49635764	0.754444	-0.20801642	0.504311	-0.20801642
	1.471446	1.133333	0.089663674	1.456324	-0.144544795	1.824682	-0.144544795
	1.872368	1.49	0.579267154	1.736312	0.349812674	2.390791	0.349812674
	1.754789	1.84	-0.22663603	1.76061	-0.029659922	1.663758	-0.029659922
	5.903989	0.843333	10.72472431	2.930067	-5.83248648	13.93857	-5.83248648
	0.677909	0.73	-0.22128849	0.724699	-0.028018952	0.57903	-0.028018952
	4.952888	3.326667	1.956139472	5.530927	-1.352585504	6.00107	-1.352585504
	0.525994	0.330018	0.198599914	0.562463	-0.103414552	0.6855	-0.103414552
	1.26652	1.288301	0.371197246	1.467707	0.782384678	1.043551	0.782384678
	2.49138	2.4627	-0.1062884	2.266947	-0.623950795	2.744492	-0.623950795
	0.585913	0.711118	-0.32509954	0.504359	-0.090118095	0.542262	-0.090118095
	4.395179	3.47	-0.27985156	3.280569	-3.035245709	6.43497	-3.035245709
	2.639157	2.189406	0.771136134	2.419819	0.145284938	3.308245	0.145284938



	PreAVG	t-3	DEffWGTO3	t-2	DEffWGTO2	t-1	DEffWGTO1
TATO	0.700452	0.656137	0.254924349	0.589761	0.040472183	0.855458	0.040472183
	1.314016	0.77225	1.013053541	1.030206	-0.519654623	2.139592	-0.519654623
	1.050106	0.747	0.268404026	1.108989	-0.598294795	1.294329	-0.598294795
	1.77366	2.003153	-0.59256651	1.701984	-0.068232056	1.615842	-0.068232056
	1.713678	2.06	-0.94354008	1.686696	-0.576943933	1.394337	-0.576943933
	0.996093	1.225	-0.38820065	0.865176	-0.063344172	0.898103	-0.063344172
	1.081225	1.141	-0.08782363	1.100798	-0.094977387	1.001876	-0.094977387
	0.317248	0.272851	0.154318204	0.360392	0.157731461	0.3185	0.157731461
	0.375981	0.37	0.146363146	0.351	0.246853841	0.406943	0.246853841
	1.115368	1.152	0.062726664	1.209908	0.234938947	0.984194	0.234938947
	0.071114	0.057675	0.029145505	0.067937	0.009256664	0.087731	0.009256664
	0.709161	0.61735	1.367599565	0.566664	0.567060076	0.943471	0.567060076
	0.621196	0.268	0.588147229	0.610151	0.823785582	0.985437	0.823785582
	0.210469	0.253782	-0.14890729	0.226333	-0.062404926	0.151293	-0.062404926
	0.441434	0.34	0.026899102	0.436897	-0.043363439	0.547404	-0.043363439
	0.56171	0.447	0.173780146	0.520894	0.104943802	0.717237	0.104943802
	0.526437	0.552	-0.06799081	0.528183	-0.008897977	0.499127	-0.008897977
	1.771197	0.253	3.217417293	0.87902	-1.749745944	4.18157	-1.749745944
	0.203373	0.219	-0.06638655	0.21741	-0.008405686	0.173709	-0.008405686
	1.485866	0.998	0.586841842	1.659278	-0.405775651	1.800321	-0.405775651
	0.157798	0.099006	0.059579974	0.168739	-0.031024366	0.20565	-0.031024366
	0.379956	0.38649	0.111359174	0.440312	0.234715403	0.313065	0.234715403
	0.747414	0.73881	-0.03188652	0.680084	-0.187185239	0.823348	-0.187185239
	0.175774	0.213335	-0.09752986	0.151308	-0.027035428	0.162679	-0.027035428
	1.318554	1.041	-0.08395547	0.984171	-0.910573713	1.930491	-0.910573713
	0.791747	0.656822	0.23134084	0.725946	0.043585481	0.992473	0.043585481

	PreAVG	t-3	DEffWGTO3	t-2	DEffWGTO2	t-1	DEffWGTO1
ACR	1.994836	0.781622	-0.48116808	0.939962	-0.224568679	0.574157	-0.224568679
	1.242262	1.575661	-1.12746157	1.167916	-4.662224162	0.540266	-4.662224162
	1.369551	1.450028	-0.41391661	0.96375	-0.437854724	0.775609	-0.437854724
	0.775289	0.280502	0.156839349	0.370094	-0.668336964	0.355918	-0.668336964
	0.816136	-0.02942	0.468658654	0.035687	0.526921559	-0.04677	0.526921559
	1.402554	-0.69825	-0.83931951	-0.7711	-5.404594433	-0.81011	-5.404594433
	1.264993	0.752324	0.266371188	0.81873	-2.285441665	0.95812	-2.285441665
	4.354303	-16.3564	7.580894722	-10.2903	2.26790933	-9.01075	2.26790933
	3.640479	-14.8704	4.519025763	-13.143	11.38629029	-15.3559	11.38629029
	1.232102	-8.34697	3.695097535	-6.8657	0.991235531	-7.79458	0.991235531
	19.75292	14.5648	-4.30279244	13.36263	-3.957925305	10.54734	-3.957925305
	2.020208	-2.12942	2.283339555	-1.708	0.42551148	-0.52567	0.42551148
	2.9023	-71.4563	62.97930606	-29.7461	11.81091724	-15.1947	11.81091724
	6.803789	-0.02518	6.617810367	0.267043	6.416226075	4.490424	6.416226075
	3.207658	-0.02918	0.592773362	0.130654	1.290275702	0.335816	1.290275702
	2.523252	-20.4809	10.77503963	-16.5905	2.360434168	-10.3698	2.360434168
	2.594716	-4.79877	-4.74079177	-6.01343	-1.025583094	-7.45324	-1.025583094
	2.422429	-28.297	24.17295618	-7.90797	-4.948196862	-1.77515	-4.948196862
	6.782991	3.668381	2.338542008	3.75807	0.368756544	5.74163	0.368756544
	0.981878	-11.4813	6.345530938	-6.71715	-1.224743693	-4.574	-1.224743693
	9.495177	8.10344	-2.19131663	4.446261	0.479415411	3.971015	0.479415411
	3.66033	-14.311	3.74987131	-14.013	0.596056933	-7.87685	0.596056933
	1.835676	-8.06854	3.585870711	-9.7635	-3.522841182	-5.42714	-3.522841182
	7.928903	2.4941	4.545240018	4.069614	1.453744076	3.461681	1.453744076
	1.133955	-13.8381	4.90149697	-16.1222	7.30697986	-12.7762	7.30697986
	1.776173	-7.97043	2.445757421	-8.05397	-3.529493534	-4.50043	-3.529493534

LIQUIT Y	PreAVG	t-3	DEffWGTO		DEffWGTO		t-1	DEffWGTO 1
			3	t-2	2			
	0.09457	0.09531					0.09774	
	9	9	0.026790179	0.09067	0.019938166		9	0.019938166
	0.01923	0.01645		0.01797			0.02326	
	2	1	0.046678198	5	0.877615581		9	0.877615581
		0.03142		0.03303			0.04030	
	0.03492	3	0.003484278	4	0.086134567		5	0.086134567
	0.08679	0.08982		0.08220			0.08834	
	2	6	-0.00616422	6	0.118603529		5	0.118603529
	0.15522	0.15956		0.14603	-	0.16008	-	
	9	9	-0.06173254	4	0.051277797		4	0.051277797
	0.23680	0.24860		0.22752			0.23429	
	7	9	0.048319642	1	0.499709682		2	0.499709682
	0.05121	0.05660		0.05180			0.04523	
	3	5	-0.02402791	4	0.242410375		2	0.242410375
	0.56512	0.65278		0.56827			0.47431	
	5	6	-0.08002036	3	0.038230152		6	0.038230152
		0.76921		0.66962	-	0.85289	-	
	0.76391	2	-0.01758715	6	0.409345907		2	0.409345907
	1.10860	1.23009		1.08345			1.01225	
	1	3	-0.44422192	4	0.069776891		7	0.069776891
	0.05294	0.05866		0.05106			0.04910	
	6	3	-0.00570569	9	0.032069223		6	0.032069223
	0.25653	0.30006		0.26121	-	0.20834	-	
	9	1	-0.18151312	4	0.038615055		3	0.038615055
	2.10496	2.29831		2.18620	-	1.83035	-	
	1	9	-1.33242681	6	0.991682248		7	0.991682248
	0.12538	0.15349		0.14600	-	0.07666	-	
	8	4	-0.07817819	6	0.032502328		3	0.032502328
	0.14415	0.15388		0.14638			0.13218	
	1	9	-0.02427878	2	-0.071232		2	-0.071232
	1.09517	1.17847		1.12098	-	0.98606	-	
	4	4	-0.35064828	7	0.095507319		2	0.095507319
	0.50925	0.44955		0.50862			0.56956	
	1	5	0.220524129	9	0.048898805		9	0.048898805
	0.95695	0.95486		0.93157				
	5	7	0.801399894	7	1.000163646		0.98442	1.000163646
	0.05501			0.06123	-	0.04103	-	
	5	0.06277	-0.01270072	9	0.001422234		5	0.001422234
	1.30446	1.43653		1.40149	-	1.07536	-	
	7	7	-0.3718454	9	0.016587797		5	0.016587797
	0.06429	0.06289		0.06872			0.06128	
	9	2	-0.01515768	1	0.004423221		4	0.004423221
	0.68185	0.77246		0.84405			0.42905	
	8	1	-0.03060992	5	0.170554991		7	0.170554991
	0.79025	0.82064		0.89670			0.65340	
	1	4	-0.31283141	4	0.137269979		6	0.137269979
		0.09316		0.08378			0.08968	
	0.08888	5	-0.03171928	9	-0.01160733		5	-0.01160733
	2.20443	1.76672			-	2.91610	-	
	3	5	-0.65572325	1.93047	2.138363536		5	2.138363536
	0.73344	0.73930					0.65319	
	5	8	-0.03678679	0.80783	0.431669346		7	0.431669346

## Appendix 5: One Sample t test Result for No ERP

### Appendix 5a: One Sample t test for WGTO

#### One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	2.609	25	.015	5.27388523	1.1101285	9.4376420
tmin3	2.871	25	.008	4.50007091	1.2715740	7.7285678
DEffWGTO3	.441	25	.663	.35407	-1.3013	2.0094
tmin2	2.686	25	.013	5.06035448	1.1797174	8.9409915
DEffWGTO2	-.553	25	.585	-.67101	-3.1700	1.8280
tmin1	2.335	25	.028	6.26123030	.7390308	11.7834298
DEffWGTO1	-1.535	25	.137	-4.08742	-9.5705	1.3956
Totalmin	4.402	77	.000	5.273885229	2.88832904	7.65944141

### Appendix 5b: One Sample t test for ARTO

#### One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	2.517	25	.019	9.82122978	1.7836410	17.8588186
tmin3	2.163	25	.040	14.67910770	.6991959	28.6590195
DEffARTO3	-1.729	25	.096	-9.47645	-20.7657	1.8128
tmin2	2.851	25	.009	7.74061741	2.1487957	13.3324391
DEffARTO2	-2.377	25	.025	-2.17544	-4.0601	-.2908
tmin1	3.030	25	.006	7.04396423	2.2558999	11.8320285
DEffARTO1	-2.810	25	.009	-1.48275	-2.5697	-.3958
Totalmin	3.845	77	.000	9.821229778	4.73532215	14.90713740

### Appendix 5c: One Sample t test for FATO

#### One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	7.668	25	.000	2.64243922	1.9327112	3.3521672
tmin3	6.566	25	.000	2.24880267	1.5433901	2.9542153
DEffFATO3	1.495	25	.147	.74142	-.2800	1.7628
tmin2	7.796	25	.000	2.41900447	1.7799631	3.0580458
DEffFATO2	1.769	25	.089	-.37084	-1.0285	.2869
tmin1	5.720	25	.000	3.25951050	2.0859850	4.4330360
DEffFATO1	-1.161	25	.257	-.37084	-1.0285	.2869
Totalmin	10.718	77	.000	2.642439215	2.15148827	3.13339016

**Appendix 5d: One Sample t test for TATO**

**One-Sample Test**

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	7.668	25	.000	.79273176	.5798134	1.0056502
tmin3	6.566	25	.000	.67464080	.4630170	.8862646
DEffTATO3	1.495	25	.147	.22243	-.0840	.5288
tmin2	7.796	25	.000	.72570134	.5339889	.9174137
DEffTATO2	1.769	25	.089	-.11125	-.3086	.0861
tmin1	5.720	25	.000	.97785315	.6257955	1.3299108
DEffTATO1	-1.161	25	.257	-.11125	-.3086	.0861
Totalmin	10.718	77	.000	.792731765	.64544648	.94001705

**Appendix 5e: One Sample t test for ACR**

**One-Sample Test**

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	4.569	25	.000	3.61211011	1.9840601	5.2401601
tmin3	-2.307	25	.030	-7.28910725	-13.7975470	-.7806675
DEffACR3	2.075	25	.048	5.30476	.0397	10.5698
tmin2	-2.605	25	.015	-4.51444180	-8.0842768	-.9446068
DEffACR2	2.140	25	.042	2.74162	.1025	5.3808
tmin1	-2.152	25	.041	-2.75920295	-5.3995081	-.1188978
DEffACR1	.696	25	.493	.60726	-1.1904	2.4049
Totalmin	-3.803	77	.000	-4.854250669	-7.39571464	-2.31278670

**Appendix 5f: One Sample t test for LIQUITY**

**One-Sample Test**

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVGmin	4.545	25	.000	.54940089	.3004281	.7983737
tmin3	4.704	25	.000	.56352757	.3168176	.8102376
DEffLIQUITY3	-1.609	25	.120	-.11256	-.2567	.0316
tmin2	4.662	25	.000	.55449911	.3095437	.7994546
DEffLIQUITY2	-.993	25	.330	-.08083	-.2485	.0869
tmin1	4.045	25	.000	.53017600	.2602229	.8001291
DEffLIQUITY1	-.028	25	.978	-.00310	-.2328	.2266
Totalmin	7.812	77	.000	.549400894	.40936231	.68943948

## Appendix 6: One Sample t test Result for with ERP

### Appendix 6a: One Sample t test for WGTO

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	4.094	25	.000	3.80576782	1.8914159	5.7201197
t1	3.472	25	.002	4.85414110	1.9744290	7.7338532
t2	3.592	25	.001	4.38934802	1.8729744	6.9057216
t3	5.557	25	.000	2.17381434	1.3681067	2.9795220
Total	5.962	77	.000	3.805767822	2.53467956	5.07685608

### Appendix 6b: One Sample t test for ARTO

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	2.878	25	.008	5.44301799	1.5478774	9.3381586
t1	3.664	25	.001	5.20266084	2.2781096	8.1272121
t2	2.677	25	.013	5.56517504	1.2829992	9.8473509
t3	2.514	25	.019	5.56121810	1.0049038	10.1175324
Total	4.936	77	.000	5.443017994	3.24708329	7.63895270

### Appendix 6c: One Sample t test for FATO

One-Sample Test

	Test Value = 0					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	7.077	25	.000	2.98302295	2.1149412	3.8511047
t1	6.199	25	.000	2.99022745	1.9967902	3.9836647
t2	7.093	25	.000	3.07016628	2.1786803	3.9616523
t3	7.532	25	.000	2.88867513	2.0988194	3.6785309
Total	12.034	77	.000	2.983022951	2.48941728	3.47662863

**Appendix 6d: One Sample t test for TATO**

**One-Sample Test**

Test Value = 0						
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	7.078	25	.000	.89490689	.6344823	1.1553314
t1	6.211	25	.000	.89706823	.5990371	1.1950994
t2	7.080	25	.000	.92104988	.6536041	1.1884957
t3	7.622	25	.000	.86660254	.6296458	1.1035593
Total	11.134	77	.000	.894906885	.74682518	1.04298859

**Appendix 6e: One Sample t test for ACR**

**One-Sample Test**

Test Value = 0						
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	-1.822	25	.080	-1.96970437	-4.1964284	.2570196
t1	-1.667	25	.108	-1.98435128	-4.4355713	.4668687
t2	-1.590	25	.124	-1.77282309	-4.0688989	.5232527
t3	-2.010	25	.055	-2.15193873	-4.3571526	.0532751
Total	-3.068	77	.003	-1.969704368	-3.24815270	-.69125604

**Appendix 6f: One Sample t test for LIQUITY**

**One-Sample Test**

Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PreAVG	5.377	25	.000	.48390169	.2985675	.6692359
t1	5.033	25	.000	.45096283	.2664298	.6354958
t2	4.854	25	.000	.47366915	.2726889	.6746494
t3	5.637	25	.000	.52707310	.3344975	.7196487
Total	9.050	77	.000	.483901694	.37743232	.59037107

## Appendix 7: Regression Data

WGTO	DEffWGTO1			ARTO	DEffARTO1		
t1	0.423466063	5.471407	5.047941	t1	-4.84751896	5.021649	9.869168
	-13.6861203	20.73886	34.42498		-5.4065808	0.973087	6.379668
	3.898578403	21.33192	17.43334		-0.0463843	0.206476	0.25286
	-3.98919253	12.3645	16.3537		-0.92468478	3.354648	4.279333
	-1.0987339	8.368454	9.467188		-1.54621204	7.119395	8.665607
	-1.54677296	2.06667	3.613443		-0.13539661	0.203911	0.339308
	8.925777268	23.70774	14.78197		0.282802268	1.19593	0.913127
	0.240402881	0.546922	0.306519		1.626074591	4.234683	2.608608
	0.151055013	0.503797	0.352742		-2.29498337	1.241523	3.536506
	0.446741088	1.133518	0.686777		-0.40636721	0.397111	0.803478
	0.48127095	1.20225	0.720979		-7.93181125	1.933404	9.865215
	10.77001592	12.27878	1.508768		0.760849731	0.948558	0.187708
	0.564499835	0.650012	0.085512		-0.58131968	3.937683	4.519003
	-0.19132704	1.021144	1.212471		-4.4520908	2.795695	7.247786
	0.455694858	2.075908	1.620213		-142.483923	37.69311	180.177
	0.271764834	0.549921	0.278156		0.497990294	2.95046	2.452469
	-0.37074719	0.529699	0.900446		-14.0892553	4.820541	18.9098
	1.254778313	1.449081	0.194303		9.757265863	11.55175	1.794484
	-0.32331337	2.235235	2.558548		-17.2903242	7.562775	24.8531
	0.582134131	1.0916	0.509466		-19.0491884	7.621754	26.67094
	1.281891068	2.436313	1.154422		-0.51360313	3.9677	4.481303
	0.125219983	0.492133	0.366913		-15.6511001	4.830278	20.48138
	0.360663951	1.02087	0.660206		-1.70030254	2.23194	3.932242
	-0.29713763	1.382094	1.679232		-12.1419678	3.480776	15.62274
	0.199612608	0.631712	0.432099		-8.00392901	5.60146	13.60539
	0.27560291	0.927116	0.651513		0.184342105	9.39289	9.208548
t2	0.67043538	5.440398	4.769962	t2	0.664729934	4.843963	4.179233
	-24.4489654	17.57974	42.0287		-0.3468275	1.140766	1.487594
	-11.718964	12.89989	24.61885		-0.02368996	0.242249	0.265939
	-5.92020468	9.262579	15.18278		-0.43709396	3.830375	4.267469
	-1.12618997	7.343836	8.470026		-3.62623357	2.344608	5.970841
	-2.14304567	0.645538	2.788583		0.037074783	0.220537	0.183462
	10.21235466	25.79526	15.5829		0.160398986	1.200803	1.040404
	1.075529941	1.540601	0.465071		-0.72615229	3.775211	4.501364
	0.529409472	0.913803	0.384393		-0.81961736	1.566724	2.386341
	0.153901185	0.972825	0.818924		-0.14018965	0.367264	0.507453
	-0.09067278	0.884886	0.975558		-7.22638802	1.907807	9.134195
	8.586336636	10.17719	1.590852		0.376075025	0.571837	0.195762



WGTO	DEFWGTO1			ARTO	DEFARTO1		
t2	1.390655447	1.595322	0.204667	t2	6.016544517	8.187132	2.170587
	-0.0070029	1.129782	1.136785		-0.93110889	2.722426	3.653535
	3.112852026	5.30158	2.188728		-15.4054927	55.99575	71.40124
	0.297514109	0.638275	0.340761		0.486257712	2.696952	2.210694
	-0.14882876	0.612697	0.761526		-4.3542574	4.691699	9.045956
	0.271801743	0.963762	0.691961		4.134227439	9.996631	5.862403
	0.357362528	2.96083	2.603467		-13.3551149	8.242424	21.59754
	-0.01642233	0.851793	0.868216		-3.32986382	6.025465	9.355329
	0.20889121	2.00953	1.800638		-0.23042125	4.086563	4.316984
	0.054282237	0.436835	0.382553		-2.66502518	4.530908	7.195934
	0.029381854	0.585561	0.55618		0.587080152	2.144996	1.557916
	-0.00546266	1.318799	1.324262		-2.20626451	3.333333	5.539598
	0.47424673	0.848106	0.37386		-6.27912755	5.815386	12.09451
	0.75463592	1.413636	0.659		-6.92102157	4.212742	11.13376
t3	-0.8350981	5.582735	6.417833	t3	-1.99193933	3.562309	5.554248
	-66.1126369	1.318653	67.43129		0.196839657	1.104526	0.907686
	-19.5130939	4.036921	23.55001		-0.04012765	0.200282	0.240409
	-7.92878746	5.484053	13.41284		-0.60629292	2.951849	3.558142
	-0.87828435	5.509066	6.387351		-1.57585866	2.30826	3.884119
	-1.9770671	0.834	2.811067		0.073101044	0.245206	0.172105
	-13.9311876	2.312107	16.24329		0.146657793	1.131274	0.984617
	0.188947121	0.681376	0.492429		-1.23189878	3.040893	4.272791
	0.731052308	1.08095	0.349897		-0.56057739	1.61976	2.180338
	0.113247322	0.826251	0.713004		0.030846915	0.380827	0.34998
	-0.43395898	0.87618	1.310139		-0.0924514	2.016981	2.109432
	3.20560227	6.52647	3.320868		0.195036766	0.481595	0.286558
	1.187159645	1.581975	0.394816		3.996018401	6.979463	2.983445
	0.028859559	1.476081	1.447222		-1.4262669	2.987989	4.414256
	3.027507287	6.064449	3.036941		-1.24882709	59.60462	60.85345
	0.143621924	0.67703	0.533409		0.384254203	3.255344	2.871089
	-0.06136041	0.581278	0.642638		-4.48147536	4.453242	8.934717
	-2.21642098	0.898595	3.115016		-8.3660135	8.679747	17.04576
	-0.04415449	3.060176	3.10433		-9.32255021	8.070865	17.39342
	-0.26181504	0.965894	1.227709		-2.29443352	5.846083	8.140516
	-0.51190876	1.948934	2.460843		-1.08137163	3.754294	4.835666
	0.134859819	0.669942	0.535083		0.443086816	5.782362	5.339275
	-0.33403708	0.590025	0.924063		-1.32882144	2.004512	3.333333
	-0.0561758	1.27401	1.330186		-2.69991061	3.175651	5.875562
	0.476207004	0.961681	0.485474		-2.12803828	6.632654	8.760692
	-0.41389206	0.700341	1.114233		-3.5403862	4.321085	7.861471

FATO	DEFFATO1			TATO	DEFTATO1	t	
t1	0.849747829	3.03687	2.187123	t1	0.254924349	0.911061	0.656137
	3.376845138	5.95101	2.574165		1.013053541	1.785303	0.77225
	0.894680086	3.38468	2.49		0.268404026	1.015404	0.747
	-1.97522169	4.701955	6.677177		-0.59256651	1.410587	2.003153
	-3.1451336	3.721533	6.866667		-0.94354008	1.11646	2.06
	-1.29400218	2.789331	4.083333		-0.38820065	0.836799	1.225
	-0.29274542	3.510588	3.803333		-0.08782363	1.053176	1.141
	0.514394014	1.423899	0.909505		0.154318204	0.42717	0.272851
	0.487877155	1.72121	1.233333		0.146363146	0.516363	0.37
	0.20908888	4.049089	3.84		0.062726664	1.214727	1.152
	0.097151683	0.289402	0.192251		0.029145505	0.086821	0.057675
	4.558665216	6.616498	2.057833		1.367599565	1.984949	0.61735
	1.960490762	2.853824	0.893333		0.588147229	0.856147	0.268
	-0.49635764	0.349582	0.845939		-0.14890729	0.104874	0.253782
	0.089663674	1.222997	1.133333		0.026899102	0.366899	0.34
	0.579267154	2.069267	1.49		0.173780146	0.62078	0.447
	-0.22663603	1.613364	1.84		-0.06799081	0.484009	0.552
	10.72472431	11.56806	0.843333		3.217417293	3.470417	0.253
	-0.22128849	0.508712	0.73		-0.06638655	0.152613	0.219
	1.956139472	5.282806	3.326667		0.586841842	1.584842	0.998
	0.198599914	0.528618	0.330018		0.059579974	0.158585	0.099006
	0.371197246	1.659498	1.288301		0.111359174	0.49785	0.38649
	-0.1062884	2.356412	2.4627		-0.03188652	0.706924	0.73881
	-0.32509954	0.386018	0.711118		-0.09752986	0.115805	0.213335
	-0.27985156	3.190148	3.47		-0.08395547	0.957045	1.041
	0.771136134	2.960542	2.189406		0.23134084	0.888163	0.656822
	-4.84396263	3.067693	1.965869	t2	0.330547284	0.920308	0.589761
	-1.14076604	6.350326	3.43402		0.874891739	1.905098	1.030206
	-0.24224917	3.484405	3.696629		-0.06366713	1.045321	1.108989
	-3.83037474	5.501756	5.67328		-0.0514573	1.650527	1.701984
	-2.3446079	2.863979	5.62232		-0.82750239	0.859194	1.686696
	-0.22053695	2.884941	2.883919		0.00030654	0.865482	0.865176
	-1.20080318	2.84496	3.669326		-0.24730995	0.853488	1.100798
	-3.77521122	1.543688	1.201307		0.102714306	0.463106	0.360392
	-1.56672365	1.957904	1.17		0.236371066	0.587371	0.351
	-0.36726355	4.033547	4.033028		0.000155727	1.210064	1.209908
	-1.9078071	0.327807	0.226457		0.030405031	0.098342	0.067937
	-0.57183745	6.155864	1.888879		1.280095614	1.846759	0.566664
	-8.1871319	7.236319	2.033837		1.560744597	2.170896	0.610151

FATO	DEFFATO1			TATO	DEFFTATO1	t	
t2	-2.72242586	0.277184	0.754444	t2	-0.14317788	0.083155	0.226333
	-55.9957487	1.841542	1.456324		0.115565526	0.552463	0.436897
	-2.69695219	2.404489	1.736312		0.200453207	0.721347	0.520894
	-4.69169901	1.549907	1.76061		-0.06321104	0.464972	0.528183
	-9.99663072	8.559455	2.930067		1.688816632	2.567837	0.87902
	-8.24242422	0.555087	0.724699		-0.05088362	0.166526	0.21741
	-6.02546524	4.285895	5.530927		-0.37350948	1.285769	1.659278
	-4.08656301	0.561759	0.562463		-0.00021135	0.168528	0.168739
	-4.53090834	1.606979	1.467707		0.041781509	0.482094	0.440312
	-2.14499621	2.66001	2.266947		0.117918966	0.798003	0.680084
	-3.33333333	0.448171	0.504359		-0.01685663	0.134451	0.151308
	-5.8153863	3.737402	3.280569		0.137050184	1.121221	0.984171
	-4.21274238	3.083255	2.419819		0.199030912	0.924977	0.725946
t3	-3.562309	2.986434	2.851527	t3	0.040472183	0.89593	0.855458
	-1.10452606	5.399791	7.131973		-0.51965462	1.619937	2.139592
	-0.2002818	2.320114	4.31443		-0.5982948	0.696034	1.294329
	-2.95184902	5.1587	5.38614		-0.06823206	1.54761	1.615842
	-2.30826019	2.724644	4.64779		-0.57694393	0.817393	1.394337
	-0.24520561	2.78253	2.993677		-0.06334417	0.834759	0.898103
	-1.13127445	3.022994	3.339586		-0.09497739	0.906898	1.001876
	-3.04089262	1.58744	1.061668		0.157731461	0.476232	0.3185
	-1.61976013	2.179322	1.356476		0.246853841	0.653797	0.406943
	-0.38082668	4.063778	3.280648		0.234938947	1.219133	0.984194
	-2.01698068	0.323293	0.292437		0.009256664	0.096988	0.087731
	-0.4815947	5.035104	3.144903		0.567060076	1.510531	0.943471
	-6.97946344	6.03074	3.284788		0.823785582	1.809222	0.985437
	-2.98798877	0.296295	0.504311		-0.06240493	0.088888	0.151293
	-59.6046183	1.680137	1.824682		-0.04336344	0.504041	0.547404
	-3.25534368	2.740604	2.390791		0.104943802	0.822181	0.717237
	-4.45324203	1.634098	1.663758		-0.00889798	0.490229	0.499127
	-8.67974674	8.106081	13.93857		-1.74974594	2.431824	4.18157
	-8.07086547	0.551011	0.57903		-0.00840569	0.165303	0.173709
	-5.84608263	4.648484	6.00107		-0.40577565	1.394545	1.800321
	-3.75429435	0.582086	0.6855		-0.03102437	0.174626	0.20565
	-5.78236229	1.825935	1.043551		0.234715403	0.547781	0.313065
	-2.00451189	2.120542	2.744492		-0.18718524	0.636163	0.823348
	-3.17565109	0.452144	0.542262		-0.02703543	0.135643	0.162679
	-6.63265408	3.399724	6.43497		-0.91057371	1.019917	1.930491
	-4.3210849	3.45353	3.308245		0.043585481	1.036059	0.992473

ACR	DEFFACR1	t		LIQUITY	DEFLIQUITY1	t	
	-0.48116808	0.300454	0.781622		0.026790179	0.12211	0.095319
	-1.12746157	0.448199	1.575661		0.046678198	0.063129	0.016451
	-0.41391661	1.036111	1.450028		0.003484278	0.034907	0.031423
	0.156839349	0.437341	0.280502		-0.00616422	0.083661	0.089826
	0.468658654	0.439235	-0.02942		-0.06173254	0.097836	0.159569
	-0.83931951	-1.53756	-0.69825		0.048319642	0.296928	0.248609
	0.266371188	1.018695	0.752324		-0.02402791	0.032577	0.056605
	7.580894722	-8.77555	-16.3564		-0.08002036	0.572765	0.652786
	4.519025763	-10.3514	-14.8704		-0.01758715	0.751625	0.769212
	3.695097535	-4.65187	-8.34697		-0.44422192	0.785871	1.230093
	-4.30279244	10.26201	14.5648		-0.00570569	0.052958	0.058663
	2.283339555	0.153918	-2.12942		-0.18151312	0.118548	0.300061
	62.97930606	-8.47699	-71.4563		-1.33242681	0.965892	2.298319
	6.617810367	6.592632	-0.02518		-0.07817819	0.075315	0.153494
	0.592773362	0.563596	-0.02918		-0.02427878	0.12961	0.153889
	10.77503963	-9.70588	-20.4809		-0.35064828	0.827825	1.178474
	-4.74079177	-9.53956	-4.79877		0.220524129	0.670079	0.449555
	24.17295618	-4.12404	-28.297		0.801399894	1.756266	0.954867
	2.338542008	6.006923	3.668381		-0.01270072	0.050069	0.06277
	6.345530938	-5.13578	-11.4813		-0.3718454	1.064692	1.436537
	-2.19131663	5.912123	8.10344		-0.01515768	0.047734	0.062892
	3.74987131	-10.5611	-14.311		-0.03060992	0.741851	0.772461
	3.585870711	-4.48267	-8.06854		-0.31283141	0.507813	0.820644
	4.545240018	7.03934	2.4941		-0.03171928	0.061446	0.093165
	4.90149697	-8.93662	-13.8381		-0.65572325	1.111002	1.766725
	2.445757421	-5.52467	-7.97043		-0.03678679	0.702522	0.739308
t2	-0.66136557	0.278597	0.939962	t2	0.033382329	0.124052	0.09067
	-0.82446295	0.343453	1.167916		0.061495128	0.079471	0.017975
	-0.16664002	0.79711	0.96375		0.026390502	0.059424	0.033034
	-0.25056685	0.119527	0.370094		0.048468488	0.130675	0.082206
	0.660138921	0.695826	0.035687		-0.06023735	0.085796	0.146034
	-7.79286685	-8.56396	-0.7711		0.755670196	0.983192	0.227521
	0.525245329	1.343975	0.81873		-0.02753988	0.024264	0.051804
	8.986241256	-1.30409	-10.2903		-0.34783246	0.220441	0.568273
	8.301725011	-4.84128	-13.143		-0.19825701	0.471369	0.669626
	1.264310922	-5.60138	-6.8657		-0.17128538	0.912169	1.083454
	-6.89331608	6.469312	13.36263		0.030430558	0.081499	0.051069
	1.803246734	0.095245	-1.708		-0.1281431	0.133071	0.261214
	26.27133132	-3.47476	-29.7461		-1.18829489	0.997911	2.186206

ACR	DEffACR1	t		LIQUITY	DEffLIQUITY1	t	
	10.33807118	10.60511	0.267043		-0.09203069	0.053975	0.146006
	1.103008964	1.233663	0.130654		-0.06996382	0.076419	0.146382
	8.225961843	-8.36451	-16.5905		-0.29221023	0.828777	1.120987
	-1.73685644	-7.75029	-6.01343		0.047892936	0.556522	0.508629
	1.647453341	-6.26052	-7.90797		1.022307256	1.953884	0.931577
	2.219978392	5.978048	3.75807		-0.01999412	0.041245	0.061239
	0.093386997	-6.62376	-6.71715		-0.2945445	1.106955	1.401499
	0.388001742	4.834262	4.446261		-0.00722071	0.0615	0.068721
	1.857719951	-12.1552	-14.013		-0.03474405	0.809311	0.844055
	0.294227005	-9.46927	-9.7635		0.102682797	0.999387	0.896704
	1.109435446	5.17905	4.069614		-0.00902625	0.074763	0.083789
	9.620692724	-6.50152	-16.1222		-0.96098288	0.969487	1.93047
	4.897984127	-3.15599	-8.05397		-0.32799196	0.479838	0.80783
t3	-0.22456868	0.349588	0.574157	t3	0.019938166	0.117687	0.097749
	-4.66222416	-4.12196	0.540266		0.877615581	0.900884	0.023269
	-0.43785472	0.337754	0.775609		0.086134567	0.126439	0.040305
	-0.66833696	-0.31242	0.355918		0.118603529	0.206948	0.088345
	0.526921559	0.480151	-0.04677		-0.0512778	0.108806	0.160084
	-5.40459443	-6.2147	-0.81011		0.499709682	0.734001	0.234292
	-2.28544167	-1.32732	0.95812		0.242410375	0.287642	0.045232
	2.26790933	-6.74284	-9.01075		0.038230152	0.512546	0.474316
	11.38629029	-3.96956	-15.3559		-0.40934591	0.443546	0.852892
	0.991235531	-6.80334	-7.79458		0.069776891	1.082033	1.012257
	-3.9579253	6.589413	10.54734		0.032069223	0.081176	0.049106
	0.42551148	-0.10016	-0.52567		-0.03861506	0.169728	0.208343
	11.81091724	-3.38381	-15.1947		-0.99168225	0.838675	1.830357
	6.416226075	10.90665	4.490424		-0.03250233	0.044161	0.076663
	1.290275702	1.626092	0.335816		-0.071232	0.06095	0.132182
	2.360434168	-8.00933	-10.3698		-0.09550732	0.890555	0.986062
	-1.02558309	-8.47883	-7.45324		0.048898805	0.618468	0.569569
	-4.94819686	-6.72335	-1.77515		1.000163646	1.984584	0.98442
	0.368756544	6.110387	5.74163		-0.00142223	0.039613	0.041035
	-1.22474369	-5.79874	-4.574		-0.0165878	1.058777	1.075365
	0.479415411	4.450431	3.971015		0.004423221	0.065707	0.061284
	0.596056933	-7.28079	-7.87685		0.170554991	0.599612	0.429057
	-3.52284118	-8.94998	-5.42714		0.137269979	0.790676	0.653406
	1.453744076	4.915425	3.461681		-0.01160733	0.078078	0.089685
	7.30697986	-5.46926	-12.7762		-2.13836354	0.777742	2.916105
	-3.52949353	-8.02992	-4.50043		0.431669346	1.084866	0.653197

## Appendix 8: Regression Result

### Appendix 8a: WGTO Regression

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.220 <sup>a</sup>	.049	.030	3.9160736674E0

a. Predictors: (Constant), WGTO times NoERP, No ERP Adoption, Inventory turnover ratio

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.445	.496		-.898	.371
Inventory turnover ratio	-.117	.042	-.250	-2.783	.006
No ERP Adoption	-.644	.730	-.081	-.882	.379
WGTO times NoERP	.124	.090	.137	1.382	.169

a. Dependent Variable: Efficiency

### Appendix 8b: ARTO Regression

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.681 <sup>a</sup>	.464	.453	2.9401818266E0

a. Predictors: (Constant), ARTO times NoERP, No ERP Adoption, Inventory turnover ratio

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.205	.382		.536	.593
Account Receivable ratio	-.233	.034	-1.024	-6.778	.000
No ERP Adoption	.079	.527	.010	.151	.881
ARTO times NoERP	.096	.037	.401	2.558	.011

a. Dependent Variable: Efficiency

Appendix 8c: FATO Regression Result

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.177 <sup>a</sup>	.031	.012	3.9513196751E0

a. Predictors: (Constant), FATO times NoERP, Fix Assets ratio, No ERP Adoption

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.354	.706		-.501	.617
Fix Assets ratio	-.269	.207	-.148	-1.301	.195
No ERP Adoption	-1.812	1.037	-.229	-1.747	.083
FATO times NoERP	.638	.292	.345	2.188	.030

a. Dependent Variable: Efficiency

Appendix 8d: TATO Regression Result

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.177 <sup>a</sup>	.031	.012	3.9513196751E0

a. Predictors: (Constant), TATO times NoERP, Account Receivable ratio, No ERP Adoption

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.354	.706		-.501	.617
Total Assets ratio	-.897	.689	-.148	-1.301	.195
No ERP Adoption	-1.812	1.037	-.229	-1.747	.083
TATO times NoERP	2.127	.972	.345	2.188	.030

a. Dependent Variable: Efficiency

## Appendix 8e: ACR Regression Result

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.361 <sup>a</sup>	.130	.113	3.7440607837E0

a. Predictors: (Constant), ACR times NoERP, No ERP Adoption, Acid ratio

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-1.904	.462		-4.120	.000
Acid ratio	-.173	.038	-.392	-4.568	.000
No ERP Adoption	.635	.644	.080	.985	.326
ACR times NoERP	.069	.084	.072	.821	.413

a. Dependent Variable: Efficiency

## Appendix 8f: LIQUITY Regression Result

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.291 <sup>a</sup>	.085	.067	3.8408008894E0

a. Predictors: (Constant), LIQUITY times NoERP, No ERP Adoption, LIQUITY ratio

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-2.320	.582		-3.984	.000
LIQUITY ratio	2.285	.705	.317	3.243	.001
No ERP Adoption	.409	.854	.052	.479	.632
LIQUITY times NoERP	-.537	1.164	-.056	-.461	.646

a. Dependent Variable: Efficiency



Appendix 8g: Regression Result Summary

Variables	Intercept	PostRatio	NonERP	NonERPxPostRatio	Adj R2
WGTO	-0.445	-0.117	-0.644	0.124	0.03
SE	0.496	0.042	0.73	0.09	
Sig	0.371	0.006	0.379	0.169	
ARTO	0.205	-0.233	0.079	0.096	0.453
SE	0.382	0.034	0.527	0.037	
Sig	0.593	0.000	0.881	0.011	
FATO	-0.354	-0.269	-1.812	0.638	0.012
SE	0.706	0.207	1.037	0.292	
Sig	0.617	0.195	0.083	0.03	
TATO	-0.354	-0.897	-1.812	2.127	0.012
SE	0.706	0.689	1.037	0.972	
Sig	0.617	0.195	0.083	0.03	
ACR	-1.904	-0.173	0.635	0.069	0.113
SE	0.462	0.038	0.644	0.084	
Sig	0.000	0.000	0.326	0.413	
LIQUITY	-2.32	2.285	0.409	-0.537	0.067
SE	0.582	0.705	0.854	1.164	
Sig	0.000	0.001	0.632	0.646	