THE EFFECT OF CAPITALISATION OF RESEARCH AND DEVELOPMENT COST ON FINANCIAL STATEMENT

A Study Case in Microsoft International Corporation USA

A THESIS

Presented as Partial Fulfillment of the Requirements
to Obtain the Bachelor Degree in Accounting Department

By:

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YOGYAKARTA

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....There is Always a Miracle for
a Never Ending Effort And
Vulnerable Spirit.
(Yuriko Nishiyama)

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Abstract

The immediate expensing of the research and development cost mandates by FASB creates some consequences with the current circumstances, concern to reliability, objectivity, and value relevance. With high growing of the information and technologies and also new industries, R&D became importance and has significant value especially for the company with high technology and knowledge such as software companies. This leads some change in accounting practice, especially for Software Company accounting, in accordance with Financial Accounting Standards Board Statement No. 86 (SFAS 86). Software capitalization, the only exception in the U.S. to the full expensing rule of R&D (SFAS 2), pertains to the development of component R&D. This statement leads some major effect on the financial statement of the company.

The purpose of this study is to explore the effect of capitalizing R&D cost in the financial statement of the software company. To reach this purpose, this study began with the nature of R&D cost which explains the reasons of R&D cost prefer to be capitalized than expensing. After that, the empirical study was deriving. First is by finding the relation between R&D expenditure and subsequent earning for a large cross section of R&D intensive firm. Second, by computing R&D and its amortization rate. Third, by adjusting reported earning and book value of Microsoft for R&D capitalization. The fourth or last step is by showing the adjusted value in the financial statement to determine the effects which come from R&D capitalization.

From the research result, the effect of capitalizing R&D on Microsoft Financial statement increase company earning for 11 percent. The effect on book value and profitability ratios are the same as the effect on earning which have positive relationship. The book value (ROE) of the company after capitalizing R&D cost are from 16% to 22%, profit margin are increase from 27% to 34% and earning per share increase from $1.380 to $1.460.

Abstraksi

Biaya riset dan pengembangan yang langsung dianggap sebagai pengeluaran sesuai dengan keputusan FASB memberikan beberapa konsekuensi pada situasi saat ini, terutama pada tingkat kepercayaan, objektivitas dan nilai yang sesuai. Dengan tingginya tingkat pertumbuhan informasi dan teknologi, R&D berkembang menjadi sesuatu yang sangat penting dan mempunyai nilai yang signifikan terutama untuk perusahaan yang mengandalkan teknologi dan informasi seperti perusahaan yang bergerak dalam bidang perangkat lunak. Hal ini membuat beberapa perubahan pada praktek akuntansi dengan keluarnya keputasan No.86 (SFAS. 86). Kapitalisasi biaya R&D untuk perusahaan Software, satu-satunya pengecualian peraturan di US mengenai biaya R&D yang langsung dianggap sebagai pengeluaran secara penuh (SFAS 2), yang berkaitan dengan komponen riset dan pengembangan. Keputusan ini memberikan beberapa pengaruh pada laporan keuangan perusahaan.

Tujuan dari riset ini adalah untuk mengetahui bagaimana pengaruh pengkapitalisasian biaya R&D pada lalporan keuangan perusahaan perangkat lunak. Untuk mencapai tujuan ini, riset ini dimulai dengan karakteristik dari biaya riset dan pengembangan yang menjadi dasar mengapa biaya R&D lebih baik dikapitalisasi daripada dianggap sebagai pengeluaran. Kemudian studi empiris dilakukan. Pertama dengan meneliti hubungan antara pengeluaran R&D dengan pendapatan untuk perusahaan-perusahaan sejenis. Kedua, dengan menghitung nilai Investasi dalam bidang R&D (R&D Capital) dengan tingkat amortisasinya. Ketiga, memperbaiki pendapatan jumlha yang dilaporkan dan nilai buku dari perusahaan setelah proses pengkapitalisasian biaya R&D. Terakhir dengan memperlihatkan nilai perbaikan R&D dalam laporan keuangan untuk mengetahui pengaruh dari pengkapitalisasian baiya riset dan pengembangan.

Dari hasil penelitian, pengaruh pengkapitalisasian biaya riset dan pengembangan dapat menaikkan pendapatan perusahaan sebesar 11 persen. Pengaruh pada nilai buku dan rasio adalah sama dengan pengaruh pada pendapatan yaitu mempunyai pengaruh yang positif. Nilai buku (ROE) perusahaan setelah pengkapitalisasian naik 16% menjadi 22%, margin laba bersih naik dari 27% menjadi 34% dan pendapatan persaham naik dari $1.380 menjadi 1.460.

CHAPTER I
INTRODUCTION

A. Study Background

The purpose of the company is to make sales as much as possible to get optimum profit. This is the basic understanding for every manager. Managers as the leader will find any other way to increase sales of the company. The way to increases sales (increasing profit) is by effective and efficient company management to decrease cost and lead to cheap product with high quality, and creating a new product or innovation to meet customer needs and wants. The last ways mean that the company needs to be improving as long as the world changes. Following world changes and, the important thing is creating a new trend to win market competition.

Creating the new innovation or the new trend is truly a hard work. Finding the customer needs and want is difficult, because this always changes as long as the world changes. For example, in the 1980'ies, computer still applied under dos program in helping users work. Right now, computer software is advancing. After Microsoft era (windows software), there are many new computer software are created to help users in processing the data or another function such as graphic design, music director etc.

Technology, science, and knowledge are rapidly change and influencing company product. This is because continuing research and development from several parties, industry nor education, find a new product, innovation, system and even market strategy, to make a better and simple product. Because of the important function which can influence company system or product, company will give allocation fund, and it might be more than another cost.

Since the nineteenth century, the unexpected growing (change in technology, communication and mass production) in the world increases the cost for research & development. For example, Macromedia Inc *(2001:4)*, a middle size Software company spent more than 84.2 million dollars for nine month research and development cost. This cost is almost as high as company salary in one period (one year). This proves that R&D is very important for this company and creates benefits in the future. However, even though this cost is high and significant value, many companies, such Macro and Microsoft, prefers to expenses this large cost than recognized it as asset, because several reason such as uncertain future benefit of R&D.

In accounting there is different kind of situation in recognizing an asset. When a company invests in material assets like machines, or computers, the money is paid out of liquid funds, and a corresponding

amount is booked as an asset on the balance sheet under a heading like "machinery". In accounting terms, there has been a negative cash flow, but no expenditure. The cost is incurred gradually, as the asset is depreciated.

When a company invests in an intangible asset like a research program, it is not generally permitted to record the value of the research as an asset on the balance sheet. The investment thus appears as a negative cash flow. Both types of investment are inspired by the same motive; to achieve higher profitability in the long term, by sacrificing cash flow in the short term.

Two problems makes accounting expensing research and development cost than capitalizing (*Suwardi,* 2000:71). First problem is about the recognition criteria. Is still on debate whether R&D cost has meets the normal definition of asset or not. FASB, explain the definition of asset is as follows:

> *Assets are probable future economic benefits obtained or controlled by particular entity as result of past transaction*

In other word, the nature of asset is a resource:

a. from which future economics benefit are expected to flow to the enterprise
b. controlled by an enterprises as a result of past events
c. gathered from result of past transaction or event

According to SAC 4 criteria recognize assets are based on the criteria as follow:

An asset can be recognized in the statement of financial position when and only when:

(a) it is probable that the service potential or future economic benefits embodied in the asset will eventuate; and

(b) the asset possesses a cost or other value that can be measured reliably

There is obviously some debate about whether R&D expenditure meets the normal definition of an asset. Clearly it only does it if it leads to the creation of saleable product. Some statement in accounting such as SFAS no.2 p. 14 is recognized R&D cost as expense because there is no direct relationship to the future benefit.

Second problem, there is no agreement between accounting scientist or organizations about the empirical measurement of R&D in accounting. This included the estimated value relates to R&D and the amortization of R&D. Until now, both accounting science and organizations are still searching a method to estimate the value of R&D.

However, in the context of SAC 4 state, there is a possibility that R&D can be recorded as asset if some requirements are fulfilled (*Kam,* 1999:365). The first two requirements state that if asset have probable

future economic value. The world 'probable', means that it is move likely rather than less likely that service potential or future economics benefit will arise. That is, the likelihood exceeds 50% probability. This is less conservative than requiring that the benefits are expected arises beyond a reasonable doubt.

The important effect of R&D cost (50% R&D future economic benefit) is appeared in the several companies. Technology base company, medical or pharmaceutical company, software Company and biomechanical company using R&D founded as their saleable product. These companies expect "future benefit" from its R&D cost.

For these companies, the immediate expensing of practically all R&D investments, an obviously inappropriate procedure given the substantial future benefits of such investments is often justified by the conservatism principle. Conservative accounting procedures goes the argument, counter manager's systematic optimism. A conservative treatment of intangibles, it is further argued, seems particularly appropriate given the generally high level of uncertainty associated with such investments. (Lev, 1999:3)

Right now the Information about R&D cost in the financial statement is very important. The change of the world, the amount of new companies base on technology are increase and also high competition

between companies, make the value of R&D became very important. R&D is not only one period benefit, but yearly benefit. When FASB issues the Statement No. 86, *Accounting for the Costs of Computer Software to Be Sold, Leased, or otherwise Marketed,* in August 1986, means that FASB realize the important of about R&D in financial statement for users. Company and investor want to know how much the value of R&D capital in the company, to make some action in the future. Building creative and effective R&D in the future and make them as a weapons to win market competition.

In this thesis, the researcher is trying to explore the effect of capitalizing research and development cost on company financial statement in software company. This company is one company which has special treatment of research and development accounting method. As mention in the SFAS statement number 2 (*accounting for Research and Development)* and also in the In SFAS statement number 38 (*Accounting for the Costs of Computer Software to be Sold, leased, or otherwise marketed),* software R&D cost is the major exception to the immediate expensing of R&D. For this reason the title of this thesis is "**The Effect of Capitalization of Research and Development Cost on Financial Statement; A Study Case in the Microsoft International Co".**

B. Problem Identification

Financial statement has important role in decision making process; it means that the information included in the financial statement must describe the real situation of the company.

R&D cost has significant influence for several kind of company such as, pharmaceutical, technological, automotive etc, as long as the rapidly change in the world. For these company, R&D is not only usual expense in one period, but is became an investment which generate value in the future. Because of that, information about the real value of R&D is important and helps manager, financial analyses and other parties know real situation of the company.

From the information above, in this thesis, the researcher makes problem identification which is how to determine the estimated value of research and development cost and the impact of capitalizing of research and development cost in the financial statement.

C. Problem Formulation

Based on the problem identification, the problem formulated as follow:

"What are the impact of capitalizing research and development cost to the financial statement of the company?"

D. Research objective

The objective of this research is to find the impact of capitalizing research and development cost on the company financial statements. The ways to reach the objective is with comparison analysis between R&D under expense and R&D under capitalize in financial statement of Microsoft company, with the result that the information in financial statement is relevant in the decision making process.

E. Research Contribution

This research will be useful in adding the understanding about the concept and nature of research and development, and also this research are useful in addressing the issues about research and development cost (capitalized or expensed) and knowing what the impact of capitalizing of research and development cost to the company financial statement.

F. Report Organization

Chapter I. Introduction

This chapter will explain about the background and idea of research. This Chapter consists of study background, problem identification, problem formulation, research objective, review of related literature, research method and report organization.

Chapter II. Theoretical Framework

This chapter will explain about the R&D in general. This chapter consists of introduction, theoretical review, and previous study

Chapter III. Research Method

This chapter consists of research method and technique of data analysis

Chapter IV. Data & Analysis

This chapter reviews of all data gathering from the research and the result of data analysis. This chapter also contains analysis and research founding.

Chapter V. Research Conclusions, Implications and Suggestion

This chapter explain about research implication, conclusion and recommendation to the other researcher.

CHAPTER II

THEORETICAL FRAMEWORK

This chapter will explain about the research and development on accounting in general. The researcher will collect as much as possible the data relating to accounting for research and development from literatures and discussion in accordance with these matters and summarize it. We began with explanation about history and development of accounting for Research and development, definition, basic assumption, function, objective, research and development as asset, the measurement, and technical approach about the implementation of accounting for research and development and the conclusion of past research of accounting for research and development.

A. Research and Development Accounting Background

Discussion about accounting for research and development arise when the FASB made decision in 1974 to require the full expensing of R&D outlays in financial reports of public corporation. Financial Accounting Standard No.2, Accounting for Research and Development Cost (October 1974), conclude that "all research and development cost encompassed by this Statement shall be charged to expense when incurred." This practice implicitly assumes the expected value of R&D is

zero. Statement 2's basis for conclusion cites several reasons for that decision, including:

- Uncertainty of future benefits—Even after the R&D stage, the failure rate for new products is high.
- Lack of causal relationship—Paragraph 41 of the basis cites studies that "generally failed to find a significant correlation between research and development expenditures and increased future benefits as measured by subsequent sales, earnings, or share of industry sales"
- Inability to measure future benefits—The basis explores *measurability* as a recognition concept, and paragraph 44 describes a notion similar to that found in the IASC *Framework:*

  The criterion of measurability would require that a resource not be recognized as an asset for accounting purposes unless at the time it is acquired or developed its future economic benefits can be identified and objectively measured.

- Lack of usefulness—Paragraph 50 of the basis cites the views of financial statement users that capitalization of R&D costs "is not useful in assessing the earnings potential of the enterprise."

But the facts which influence the accounting for R&D arrives. High developing company with the high technology of product makes the economic and the company accelerated. Since the 1960s, R&D investment in the United States and other leading industrial economies has exhibited strong and generally consistent growth characteristics. Total annual R&D

expenditures in the U.S. increased from $26 billion in 1970 to $206 billion in 1997; representing an average yearly growth rate of 8%, while investment in plant and equipment over the same period increased annually by 6.8% on average. Collateral intangible investments in other areas that impact directly on firm-level innovation - IT and information systems, supply chain responsiveness, brands and workforce skills - exhibit broadly comparable growth rates. As a result, corporate intangible investment in the economy is now running on a par with tangible investment in plant and equipment, at GDP intensity approximately twice as much that of Europe and Japan (US Economic Journal)

A new approach was arising from the fact above. New industries which require research for producing new product such as software companies make FASB realize that R&D value is important to the users. In August 1986 FASB issues Statement No. 86, *Accounting for the Costs of Computer Software to Be Sold, Leased, or Otherwise Marketed.*

In 1997, in order to make observation about accounting change, several accounting scientist build an organization named Intangible Research Center at the Vincent C. Ross Institute of Accounting Research. The Intangible Research Center was established in order to study the intangible asset which became more important at the current time. This company also was established to assist researcher in obtaining access to

internal data on corporate intangible investment, and to link researcher with executive in charge of R&D, brand management and human capital development for the purposes of interview, discussion and exchange information.

FASB established a Task Force on Business Combinations to examine, among other things, the accounting treatment of acquired intangibles, some of which (R&D-in-process) are immediately expensed by acquirers (Deng and Lev 1998). Also, the Accounting Standards Executive Committee of the AICPA (AcSEC) released in March 1998 a Statement of Position on accounting for software for internal use (SFAS 86, the focus of this study, deals with software intended for sale), calling for the capitalization of certain development costs in a similar manner to SFAS 86. Abroad, the International Accounting Standards Committee (IASC) is about to issue Standard No. 38 on intangibles which calls for the capitalization of internally developed intangibles with identifiable benefits (IASC, 1998). While SFAS 86 deals only with the capitalization of post-feasibility development costs, an assessment of the record of SFAS 86 should benefit the reexamination of accounting for intangible.

In 2001, FASB published report explaining about the change in the new economy. This report is explains about economic change of the world which influences the accounting methods. This report explains about new

economy. Recent accounting issue and especially explain about intangible asset which became more important than tangible it self.

Even right now, the accounting for research and development still explore. FASB still invite scientist to give proposal about the intangible asset in general and especially about the research and development accounting system.

B. Definition of Research and Development

In the last nineteenth century, a new trends influence the operating of the company. This is because high competition with another company which make one company not only continuing last product but trying to create new innovation or new product. Intangible asset became very important in the continuing the business. Because of that, companies' right now are investing on the intangible capital, such as human, interest, technology, especially in R&D more than in the tangible capital. The example of this are, they create a separable department for research and development to catch new information and creating new product or innovation.

This fact led another description of the asset. The importance of intangible capital was arise and moving along with globalization. Because of this, FASB and other accounting organizations change several

definitions in order to look forward of new economic condition, and trying to explain, organize and arrange it to get high quality of financial statement. Several explanations about this were explained in this sub chapter.

Since research and development including in the intangible asset (Lev, 1996:108), so we began the definition from the intangible asset in the financial accounting organization.

The Intangibles Research Center at New York University offers two possible definitions:

> **Broad Definition**—*Intangibles are nonphysical sources of probable future economic benefits to an entity or alternatively all the elements of a business enterprise that exist in addition to monetary and tangible assets.*
>
> **Narrow Definition**—*Intangibles are nonphysical sources of probable future economic benefits to an entity that have been acquired in an exchange or developed internally from identifiable costs, have a finite life, have market value apart from the entity, and are owned or controlled by the entity.*

The FASB Exposure Draft, *Business Combinations and Intangible Assets,* offered:

> *Intangible assets are non-current assets (not including financial instruments) that lack physical substance.*

IAS 38 makes definition of intangible asset which is including the definition of research and development. The definition of the intangible asset according to IAS 38 is:

> *An **intangible asset** is an identifiable non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to other, or to administrative purposes.*

This definition included enterprises activity in expanding resources, or incur liabilities, on the acquisition, development, maintenance or enhancement of intangible resources such as scientific or technical knowledge, design and implementation of new systems, licenses, intellectual property, market knowledge and trademarks (including brand names and publishing titles). Common examples of items encompassed by these broad headings are computer software, patents, copyrights, motion picture films, customer list, mortgage servicing rights, fishing licenses, import quotas, franchises, customer or supplier or supplier relationship, customer loyalty, market share and marketing

IAS 38 also gives each definition of the research and development:

Research is original and planned investigation undertaken with the prospect of gaining new scientific or technical knowledge and understanding.

Development is the application of research finding or other knowledge to a plan or design for the production of new substantially improved materials, device, product, processes, system or services prior to the commencement of commercial production or use.

Another definition is from IASC in Chapter 12:

Expenditure incurred in developing new product or modifying old product

Cost which related to preproduction effort and not those costs related to present production

The elements of R&D cost are as follow:

1. Material, equipment, and facilities that have no use other than R&D
2. Personnel engaged in R&D activities

3. Purchase intangible
4. Contract service performed by other for R&D activities
5. Indirect cost related to R&D activities

C. Assumption of Research and Development Accounting

In respect of R&D, a number of key assumptions were adopted at the outset (*Lev*, 2000):

- The mainspring of future world economic growth is concentrated on a group of key industries bounded by the hi-tech, life-sciences and business-services sectors. These industries are highly R&D-intensive (in 1996 the average R&D intensities of electronics, drugs, software and biotech companies were, respectively, 6.1%, 12.0%, 17.8% and 41% of sales, compared to an overall average of around 4%).
- Free access to basic (academic) research will be essential to firm-level innovation - not only as feeder technologies, but as a source of innovation in such areas as the effectiveness of the supply-chain, productivity (value-added) enhancements, and technology applications in new as yet unforeseen forms of business relationship.

- It is the intention of government and its public institutions to actively pursue policies geared to promoting a strong domestic climate for economic growth and welfare improvement, free of price controls and supported by a regulatory system capable of identifying and limiting the effects of material market failures.

D. Function of Research and Development Accounting.

According to the FASB, a characteristic of high quality financial reporting is that information provided to investors is comparable, verifiable and provided on a consistent basis from period to period. Report of the R&D activity, help interested parties to get information from inside activity of the company. Mistake in reporting of R&D value in the financial reporting have significant effect in the company portfolio. (Lev, 1998: 30)

Company with high growth R&D and relative earning momentum, are associated with positive and increasing excess returns, suggesting a systematic undervaluation of these companies shares. Such an undervaluation implies that the cost of capital of these companies is high, relative to a proper valuation. A high cost of capital is detrimental to the expansion and growth of these companies. The R&D accounting has importance function relating to the valuation of the company asset which implies to financial statement. (*Lev*, 1999:22)

E. The Purposes of Research and Development Accounting

The summary of FASB Concepts Statement No. 1, *Objectives of Financial Reporting by Business Enterprises,* describes the three basic objectives of financial reporting:

> *Financial reporting should provide information that is useful to present and potential investors and creditors and other users in making rational investment, credit, and similar decisions. The information should be comprehensible to those who have a reasonable understanding of business and economic activities and are willing to study the information with reasonable diligence.*
>
> *Financial reporting should provide information to help present and potential investors and creditors and other users in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from the sale, redemption, or maturity of securities or loans. Since investors' and creditors' cash flows are related to enterprise cash flows, financial reporting should provide information to help investors, creditors, and others assess the amounts, timing, and uncertainty of prospective net cash inflows to the related enterprise.*
>
> *Financial reporting should provide information about the economic resources of an enterprise, the claims to those resources (obligations of the enterprise to transfer resources to other entities and owners' equity), and the effects of transactions, events, and circumstances that change its resources and claims to those resources.*

The last objective is the most relevant here. Financial reporting tries to provide information about economic resources and the two groups that hold claims against those economic resources. In doing so, it provides investors, creditors, and the broader capital markets with a feedback mechanism. That is, it helps to confirm or correct prior expectations.

Reporting R&D in real value with clear measurement help interested users to analyze company value accurately, especially for the

companies which produce the product rely on continuing research such as pharmacy, software and technological company. In conclusion, accurate value R&D data created high quality and reliable financial statement. In specific, R&D accounting has purposes is creating a closeness, real and relevance the value of R&D to get the high quality of financial statement in order to satisfy users.

F. The Importance of Accounting for Research and Development

The accurate value of R&D is important to:

a. Shareholder and their advisor, for assessing true worth of the company
b. Management, as useful tools for measuring performance, for taxation purposes and for acquisition or disposal.
c. Financier, for assessing the borrowing capacity of a company when arranging funding facilities. Sophisticated lending institutions now recognize the value of certain intangible assets as security for loans.

What has been reported to the investment community is what gets attention from both external investors and internal managers. So it isn't enough to invest in intangibles. The investment must be communicated, and the return on the investment must be clear. One force behind the relative strength of the U.S economy is the efficiency of its firms' investments in intangibles.

G. Research and Development as an Asset

The problem of the research and development accounting is the recognizing matter whether the research and development cost recognize as an asset or expense in the financial statement. The debatable concept of the accounting for research and development (will be explained in the next section) began from the concept and definition of asset it self.

In paragraph 25, FASB Concepts Statement No. 6, *Elements of Financial Statements*, defines an asset this way:

> *Assets are probable 18 future economic benefits obtained or controlled by a particular entity as a result of past transactions or events.*

Paragraph 49(a) of the IASC *Framework* provides a similar definition:

> *An asset is a resource controlled by the enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise.*

Both definitions include the same essential characteristics of an asset. It represents **future economic benefits**, is a consequence of a **past transaction or event**, and is **controlled** by the entity.

Footnote 18 in concepts statement 6 clarifies the use of the term *probable:*

> *Probable* is used with its usual general meaning, rather than in a specific accounting or technical sense (such as that in FASB Statement No. 5, *Accounting for Contingencies*, par. 3), and refers to that which can reasonably be expected or believed on the basis of available evidence or logic but is neither certain nor proved (*Webster's New World Dictionary of the American Language*, 2d college ed. [New York: Simon and Schuster, 1982], p. 1132). Its inclusion in the definition is intended to acknowledge that business and other

economic activities occur in an environment characterized by uncertainty in which few outcomes are certain (pars. 44-48).

The word *probable* sometimes leads readers astray. How, they wonder, can something be an asset under the FASB definition unless its future benefits are at least 50.1 percent likely? And how can an accountant make that prediction? A 1998 FASB Special Report by the late Reed Storey (the intellectual force behind the FASB Conceptual Framework) and Sylvia Storey gave the following discussion of probable future benefits:

> The word probable is included in the asset and liability definitions with its general, not accounting or technical, meaning and refers to that which can reasonably be expected or believed on the basis of available evidence or logic but is neither certain nor proved. Its use was intended to indicate that something does not have to be certain or proved to qualify as an asset or liability. The first Exposure Draft did not contain the word probable. It identified assets with "economic resources—cash and future economic benefits—" saying that a "resource other than cash . . . must, singly or in combination with other resources, contribute directly or indirectly to future cash inflows . . ." and identified liabilities with "obligations . . . to other entities," saying that "the obligation must involve future sacrifice of resources. . . ." The Board received many comment letters that said, in essence, "almost nothing can ever be an asset or liability because you have said that it has to be certain, and everything except cash is uncertain."
> The Board thus inserted "probable" into the definition, but perhaps "expected" would have been a better word. As long as someone thinks that an item has value and is willing to pay for it, the item has value and meets the definition of assets, even if the expectation turns out to have been mistaken. It is easy to read more into the use of probable than was intended. Probable is not an essential part of the definitions; its function is to acknowledge the presence of uncertainty and to say that the future economic benefits or sacrifices do not have to be certain to qualify the items in question as assets and liabilities, not to specify a characteristic that must be present.

Although the application of the definitions of assets and liabilities commonly requires some assessment of probabilities, degrees of probability are not part of the definitions. The degree of probability of a future economic benefit (or of a future cash outlay or other sacrifice of future economic benefits) and the degree to which its amount can be estimated with reasonable reliability, both of which are required to recognize an item as an asset (or a liability), are recognition and measurement matters.

G.1. Recognition Criteria

An entity may possess items that meet the definition of assets and still not recognize those items in financial statements. Paragraph 63 of FASB Concepts Statement No. 5, *Recognition and Measurement in Financial Statements of Business Enterprises*, identifies four recognition criteria:

An item and information about it should meet four fundamental recognition criteria to be recognized and should be recognized when the criteria are met, subject to a cost-benefit constraint and a materiality threshold. Those criteria are:

Definitions—the item meets the definition of an element of financial statements.

Measurability—it has a relevant attribute measurable with sufficient reliability.

Relevance— the information about it is capable of making a difference in user decisions.

Reliability— The information is representtationally faithful, verifiable, and neutral.

All four criteria are subject to a pervasive cost-benefit constraint: the expected benefits from recognizing a particular item should justify perceived costs of providing and using the information. Recognition is also subject to a materiality threshold: an item and information about it need not be recognized in a set of financial statements if the item is not large enough to be material and the aggregate of individually immaterial items is not large enough to be material to those financial statements.

Few would argue that information about intangible assets is not relevant, but many questions on whether those items are measurable. In this context, measurability means more than simply "how much." Any competent manager monitors the ongoing cost of research and development (R&D) projects. Assigning a cost measurement to a company's investment in R&D is a straightforward exercise in cost accounting. But the recognition criterion requires a *relevant* measurement attribute, and some question the relevance of historical cost as a measurement of intangible assets.

Paragraph 83 of the IASC *Framework* provides a similar recognition concept:

An item that meets the definition of an element should be recognized if:

(a) It is probable that any future economic benefit associated with the item will flow to or from the enterprise; and

(b) The item has a cost or value that can be measured with reliability.

Paragraphs 89 and 90 expand on the IASC concept:

> An asset is recognized in the balance sheet when it is probable that the future economic benefits will flow to the enterprise and the asset has a cost or value that can be measured reliably.
> An asset is not recognized in the balance sheet when expenditure has been incurred for which it is considered improbable that economic benefits will flow to the enterprise beyond the current accounting period. Instead such a transaction results in the recognition of an expense in the income statement. This treatment does not imply either that the intention of management in incurring expenditure was other than to generate future economic benefits for the enterprise or that management was misguided. The only implication is that the degree of certainty that economic benefits will flow to the enterprise beyond the current accounting period is insufficient to warrant the recognition of an asset.

In conclusion from the recognition criteria created by neither FASB nor IASC there several reason that R&D can be recognized as an asset. R&D has fulfilled three essential characteristic of an asset as follow:

1. Future benefit, described in Concepts Statement 6 as the "capacity, singly or in combination with other assets, to contribute directly or indirectly to future net cash inflows"
2. Control, which implies both the ability to derive the future benefits and to deny that ability to others

3. A past transaction or event that gives rise to the entity's control over future benefits.

The fact that in the investment in R&D has significant effect for the company (in value for R&D investment is more than $150 billion in US), prove that research and development have strong relationship with the economic future value (otherwise, why investor invest such a big money?) Numerous empirical studies (e.g., Griliches 1995, Lev and Sougiannis 1996) have established an economically meaningful and statistically significant relationship between R&D outlays and subsequent benefits, in the form of increased productivity, earnings and shareholder value. This relationship holds at the national, industry and company levels.

An enterprise controls an asset if the enterprise has the power to obtain the future economic benefits flowing from the underlying resource and also care strict the access of others to those benefits. In other word, the company can buy or sell the R&D to the other company and the company can protect R&D activity from other competitors. For, example, when IBM purchase Lotus development Corp. in 1995, IBM paid 1,840 millions (57% of the total purchase price) for Lotus all Lotus research and development, including current software product and in-process R&D.

H. Alternative Accounting Method for R&D

Several alternatives for research and development accounting treatment (FASB, CH 12):

1. Charge all costs to expense as they are incurred
2. Capitalize all costs when they are incurred
3. Accumulate all costs in a special category until they are determined to have future benefits.
4. Accumulate all costs in a special category until they are determined to have future benefit
5. R&D costs are all to be expensed as they incurred.

I. Technical Approach of Implementation for R&D Accounting

Sougiannis (1994:47) make equation to value research and development value. The equation is as a conclusion from the valuing asset method by Ohlson (1989) and equation made by FASB statement No.2.

Ohlson derives the following equation:

$$P_t = Y_t + \beta[X_t - rY_{t-1}] + \gamma * Z_t$$

Where P_t is the market value of the firm's stock at time t; Y_t is the book value of equity at time t; X_t is reported accounting earning at time t; r is the risk free interest rate; $[X_t - rY_{t-1}]$ is defined by Ohlson as abnormal earning; Z_t is a vector of other information variables at time t; and β, γ are

valuation parameters. If earnings and book values are sufficient to value of the firm, then $\gamma = 0$, other wise $\gamma \neq 0$.

In 1974 the FASB Statement No.2 mandated the immediate expensing of R&D expenditures. As result, reported accounting earning may be written as

$$X_t = \left(X_t^B - V_t\right)\left(1-\tau_1\right) = X_t^B\left(1-\tau_1\right) + V_t\tau_t - V_t$$

Where X_t^B is earning before expensing R&D expenditures at time t; V is R&D expenditure at time t; and τ_1 is the firm tax rate at time t.

Further, under an accounting policy of capitalization, the book value of equity would include an R&D capital component and earning would include and an R&D expense component, both of which would be function of current and past R&D expenditure. In valuation studies conducted by Cockburn and and Griliches (1988) and Hall (1988), the R&D capital variable was found to have a significant coefficient with a value close to 1. This implies that lagged R&D expenditure can be value-relevant, on average. Given the current practice of R&D and the consequent absence of R&D capital and expense variables, current and lagged R&D expenditures need to be included in the valuation equation. Thus equation became:

$$P_t = Y_t + \beta_1\left[X_t^B(1-\tau_1) - rY_{t-1}\right] + \beta_2\left[V_t\tau_t\right] + \sum_{t=0}^{a}\beta_{3,t}V_{t-i}$$

White et. All describing following simplified valuation model:

Value = p x Net inflow

The model can be used to represent a (constant) discounted earnings model, where net inflows represent revenue and expense flows and coefficient p is simply the price/earnings (P/E) ratio. Disaggregating the net inflow into inflows and outflow yields.

Value = p x inflows - p x expense outflows +b x asset outflows.

Where asset outflows represent expenditures for such categories as R&D. If these outflow are actually expensed, then $b = -p$

From a valuation perspective, the differences between asset and expense outflows should be on whether the associated outflows have expected future benefits. The level and sign of the coefficient b measures whether the outflow should be considered as an expense. An expense benefits only the period of occurrence, the outlay reduces value by $-p$ times the outflow. An asset outflow benefits future period and, therefore, the coefficient b should be positive.

The asset outflows representing future benefits can be treated as growth component. A firm with a growth, its value can be expressed as:

$$\text{Value} = \frac{E}{r} + \left[\frac{1}{r}\left(\frac{r^* - r}{r - ar^*}\right)\right]aE$$

Where E is earnings, r is the appropriate discount rate, r^* the amount the firm earns on its investment and aE the amount the firm reinvests.

Lev (1996) explained the value of research and development from its relationship with earnings. The equation is:

$$(OI/S)_{it} = \alpha_0 + \alpha_1 (TA/S)_{i,t-1} + \sum_k \alpha_{2,k} (RD/S)_{i,t-k} + \alpha_3 (AD/S)_{i,t-1} + e_{it}$$

OI = annual operating income, before depreciation, advertising and R&D expenses, of firm *i* year *t*.

S = annual sales

TA = the value of plant and equipment, inventory, and investment in unconsolidated subsidiaries and goodwill, in current dollars, measures at the beginning-of-years value.

RD = annual R&D expenditure in current dollars

AD = advertising expenses, measured at the beginning-of-years values

J. Pro and Contra for R&D Accounting

The new paradigm of financial sector, found that right now intangible capital (such as R&D, Human, Intellectual) has important role in the business, increase the question about the definition of asset. FASB, AICPA and other accounting institution, have three characteristic of asset. It represents **future economic benefits**, that is a consequence of a **past transaction or event**, and its **controlled** by the entity (explain in previous sub chapter). This characteristic makes some debatable objects whether an intangible asset such as R&D is recognizing as asset in the financial

statement (capitalizing) or only just usual company expenditure which is company did not expect "something" from the intangible asset.

The next explanation will explain about articles, argumentation about this problem. In accordance with the title of this thesis, the researcher only focused on R&D problem. The question is, whether R&D is reported as asset in the financial statement (Capitalizing) or recognizing as expense? Several explanations from journals, research and also statement will explain the reason behind capitalizing R&D or expense it.

J.1.Supported Side

Dukes (1974) found that the amount of research and development cost incurred and expense during the period was significantly related to the security price of the firm. All of the firm in the Dukes study followed the accounting policy of expensing research and development costs, yet result were consistent with investor making capitalization adjustments to research and development cost in estimating the future potential of the firm. That is, the "research intensity" of the firm (more precisely, the research intensity of the industry in which a firm found itself) was a significant explanatory variable in explaining the market value of the firm.

Dukes suggests that capitalization may serve a useful purpose in adding the investor to predict the future return of a security.

Grabowski and Mueller (1974) investigated the rate of return on investments in physical capital, in research and development and in advertising. They conclude that their result 'indicates that R&D does increase the profitability of the firm over competitive levels." For the 86 firm included their sample, "additional R&D did increase the rate of return on total capital."

White et. all (1986:343-348), in their book, the analysis and uses of financial statement, explain about the effect of accounting method of R&D in income statement, balance sheet, cash flow statement and financial statement ratios

SSAP 13 permits the capitalization of research and development expenditure which may effect on drugs companies, electronics, biotechnology engineering etc.

Sougiannis (1994:44-48) in the research about the valuation of research and development cost, found that the result from the earnings indicate that reported earnings, adjusted for the expensing of R&D, do reflect realized benefits from R&D. On average, a one-dollar increase in R&D expenditure leads to a two dollar increase in profit over a seven year period. Then he concludes two important research results. From the valuation model indicate that investor place a high value on R&D investment.

Lev and Sougiannis (1996) explain about the relation between R&D and future operating income. They document a relation between R&D and future operating income suggesting an asset with useful life ranging from three to five years (scientific instrument industry) to nine years (chemical and pharmaceutical). Further, their price and return valuation suggest that market capitalizes the expenditure (R&D) as an asset and effectively amortizes the asset as the benefit is received from it. Lev and Sougiannis (1996) also find the subsequent returns are correlated with the current research and development is incomplete.

Amir and Lev's (1996) study of cellular companies, indicating that investors implicitly capitalize customer acquisition costs, also indicates that the capitalization of these costs will improve the alignment of book values with intrinsic values.

Samuelson (1996), explain the need of new accounting definition of an asset. In this writing, he proposed the new definition of asset as property rights. Productive resources such as raw material, equipment and plant are assets of the person who own the right to use those resources. The same is true for product and money. Claims to receive money and ownership interest in other enterprises are not in themselves resources or tangible wealth, but they are right to (or claims against) the wealth or resources of others. What distinguishes all of these things as

assets is not that they are economic resources, but they prefer use wealth. This definition also explain about company cost represent acquisition of services that are used up shortly after acquisition and do not create new right to wealth in the short time, such as R&D, human, goodwill etc . This is not the cost of production, but if future economic benefits are interpreted as net cash inflows thy may represent as asset, depending the probability of future cash flows.

Internationally, Abrahams and Sidhu (1997) finding that capitalized R&D values on Australian companies' balance sheets are significantly associated with market values, and Barth and Clinch (1997) finding that revaluations of intangibles by Australian companies are associated with market values, are also consistent with the claim that the capitalization of intangibles will improve the alignment of book values with intrinsic values.

Karl-Erik Sveiby (1998), conducted research about increases expense on intangible. He said that on the new knowledge economy right now, some expenses which generate future value and it are clearly owned by the company which than can be recognized as asset. This "asset" clearly has significant relationship with the market value.

Aboody and Lev (1998) examine both the 10-year record of SFAS 86, the major exception in the US to the immediate expensing of R&D, and

the validity of arguments advanced in the March 1996 petition of the Software Publishers Association (SPA) to abolish SFAS 86. They contemporaneous (stock prices and returns) as well as intertemporal (subsequent earnings) analyses indicate that capitalization-related variables (annual amount capitalized, the value of the software asset and its amortization) are significantly associated with capital market variables and future earnings. They found that software capitalization summarizes information relevant to investors.

SEC Chair Arthur Levitt and Chief Accountant Lyn Turner (1999) are concern about this matter. They said:

> *"unreasonable valuations of IPR&D appear to be caused frequently by management's treatment of attributes of capitalized assets as if they were attributes of IPR&D. A common practice problem is the bifurcation of purchased rights to technology into two categories: the immediate value of any presently completed product, and the future value of the right to enhance or embellish that product. The latter right was deemed to be IPR&D because that right will be used in research and development." The SEC staff believes that the value of the right to enhance or embellish an existing product, or an existing technology that has alternative future uses, is not separable from the value of ownership of the intellectual rights to the technology. Therefore, if the technology meets the criteria for capitalization, the fair value includes the value of the right to enhance or embellish the technology.*

J.2. Opponent Side

The first contra of capitalizing R&D comes form FASB. In FASB Statement No. 2, *Accounting for Research and Development Costs*, was issued in October 1974. The Statement provides a simple rule for R&D costs—

they are to be charged to expense as incurred. Statement 2's basis for conclusion cites several reasons for that decision, including:

- Uncertainty of future benefits—even after the R&D stage, the failure rate for new products is high.

- Lack of causal relationship—Paragraph 41 of the basis cites studies that "generally failed to find a significant correlation between research and development expenditures and increased future benefits as measured by subsequent sales, earnings, or share of industry sales"

- Inability to measure future benefits—The basis explores *measurability* as a recognition concept, and paragraph 44 describes a notion similar to that found in the IASC *Framework:*
  The criterion of measurability would require that a resource not be recognized as an asset for accounting purposes unless at the time it is acquired or developed its future economic benefits can be identified and objectively measured.

- Lack of usefulness—Paragraph 50 of the basis cites the views of financial statement users that capitalization of R&D costs "is not useful in assessing the earnings potential of the enterprise."

Nine from fifteen company executive in Canada reported by Enwistle (1992:3) do not very concern about this matter. They felt that the, amount of the research and development is not significant and application is more important then research it self.

APB Statement No. 4, indicates that certain cost are immediately "recognized as expense because allocating them to several accounting periods is considered to serve no useful purpose. "Citing evidence of the high degree of uncertainty associated with research and development and the views of security analysts and other professional investor, the

capitalization of any research and development costs is not useful in assessment of the earnings potential enterprise.

Another statement came from the SPA (Software Publishers Association). The major claim put forward by the SPA is that, given industry changes since 1986, capitalization of software development costs does not benefit investors:

> *The rationale underlying the capitalization of software development costs is to recognize the existence of an asset of the corporation. However, an asset should be recognized.... only if ultimate realization of the asset is reasonably assured ... Due to factors such as the ever-increasing volatility in the software marketplace, the compression of product cycles, the heightened level of competition and the divergence of technology platforms, realization of software assets has become increasingly uncertain even at the point of technological feasibility.... We do not believe that software development costs are a useful predictive factor of future product sales. (SPA March 14, 1996 letter, p.4).*

Thus, the Software Publishers Association concludes:

> *Financial reporting and financial statements would be more reliable and consistent if all software development costs were required to be charged to expense.)*

Skepticism about the relevance and reliability of R&D capitalization is widespread, as reflected, for example, in the following statement by the Association for Investment Management and Research (AIMR):

> *We are not enamored of recording self-developed intangible assets unless their values are readily apparent. We consider the cost of creating them to be so often unrelated to their actual value as to be irrelevant in the investment valuation process. Furthermore, it usually is next to impossible to determine in any sensible or codifiable manner exactly which costs provide future benefit and which do not. (AIMR, 1993, pp. 50-51).*

CHAPTER III

RESEARCH METHOD

This chapter will explain about the research method used by the researcher. This chapter consists of research objects, research methodology, research subject, research instrument, and technique of data analysis. This chapter is the explanation about the procedure of analysis to reach the research objective stated in the previous chapter.

A. Research Method

A.1. Research Object

The main object of this research is Microsoft Company financial report. This research focuses on R&D value of the company and also the impact of it after the capitalization of R&D expense.

A.2. Research Method

In this research, the researcher uses a descriptive comparative method. Whitney (1960:160) stated the descriptive method is a research of fact through exact interpretation certain condition and situation. The work of the researcher is not only giving the overview of the real phenomena but also explaining the relation, testing hypothesis, making prediction and

getting the solution and implication of the problem that are going to be solved.

A.3. Research Instrument

The researcher is willing to find the data through internet. The data provided here are from the SEC filling (www.edgar.com), Public Register Annual Report (www.PRARS.com), company home page and also all the resource related to the topics such as the author home page.

The data is divided into two kinds of data as follow:

1. Primary data

The data gathered by the researcher for specific purposes of addressing research problem.

The data consist of:

- Company's profile
- Company History
- Organization Structure
- Company research
- Financial Statement

2. Secondary data

These data are used to count the Research and Development estimated value, in which its coefficient derives from software company financial data. These data consist of 74 company financial

statements reported in the SEC filling. The statements consist of three part; tangible asset, revenue, Research and development and advertising expense and also income before advertising, R&D and amortization expense (in appendices).

The characteristic of the data taken by researcher are; 1) have the same product with the Microsoft Company; 2) the company is listed in the PRARS ; 3) the company is listed in SEC at leas have 8 years financial statement; and 4) Have R&D Account.

A.4. Technique of Data Analysis

The main objective of this research is to determine the issue of the reliability, objectivity, value relevance and also the effect of capitalizing R&D cost in the company financial statement. The steps to reach this objective are:

1. Estimating the relation between R&D expenditure and subsequent earning for a large cross section of R&D intensive firm.
2. Based on the estimation, compute firm specific R&D capital and its amortization rate.
3. Adjusting reported earnings and book values of the sample firm for the R&D capitalization.
4. Showing the adjusted value in the financial statement.

A.5.A. Determine R&D Estimated Value

The important problem in this research is how to determine the estimated value of the research and development capital. To solve this problem, the researcher uses the Lev and Sougiannis model (Lev, Sougianis, 1996:107-138). The assumption of the method is corporate operating income is generated by tangibles and intangibles asset. The reasons why researcher uses this method are:

1. This method created the closeness estimation (relation between R&D expense and its indicator, earnings) of R&D value. By considering other factors of profitability, this method enables us to focus on the incremental contribution of R&D to firm's profitability. Stated differently, in estimating the contribution of R&D to profitability, we control for the contribution of other productive factors to profitability
2. There are no any judgmental factors into the estimation, beyond the underlying assumptions (e.g., that operating income is generated by tangible and intangible assets). In other words, there is no subjective estimation of the contribution of R&D to income. The estimated coefficients in the next section are the results of statistically estimating the fundamental model (4) from the data.

The Model

The researcher estimation of R&D productivity is derived from a "production function," reflecting the fundamental relation between the value of corporate assets and the earnings, or operating income generated by them (Lev & Sougiannis 1996:110). Accordingly, define the operating income (OI_{it}) of firm i in year t, as a function of tangible, TA_{it}, and intangible assets, IA_{it}, where the latter includes the R&D capital:

$$OI_{it} = g(TA_{it}, IA_{it}). \qquad (1)$$

While the values of operating income and tangible assets (at historical costs) are reported in financial statements, the intangible capital, IA, is not reported and therefore has to be estimated.

Given the focus on R&D, we single it out of all intangible assets and define its value, RDC_{it}, as the sum of the *un-amortized* past R&D expenditures. Those are the expenditures that are expected to generate current and future income:

$$RDC_{it} = \sum_{k} \alpha_{ik} RD_{i,t-k}, \qquad (2)$$

where α_{ik} is the contribution of a dollar R&D expenditure in year $t - k$ ($k = 0, \ldots, N$) to subsequent earnings (i.e., the proportion of the R&D expenditure in year $t - k$ that is still productive in year t). Substituting expression (2) into (1) yields:

$$OI_{it} = g(TA_{it}, \sum \alpha_{ik} RD_{i,t-k}, OIA_{it}), \qquad (3)$$

Where OIA_{it} are other (than R&D) intangibles assets (e.g. brand values

The variables in relation (3) are defined thus. Operating income, OI_{it}, is measured as reported operating income (sales minus cost of sales) before depreciation and the expensing of R&D and advertising. Operating income is used as a measure of R&D benefits, since R&D investment and its consequences seem largely unrelated to non-operating items, such as administrative expenses and financing charges. Depreciation, R&D, and advertising expenses were excluded from (added back to) operating income since they represent, largely ad hoc write-offs of the independent variables in (3) – tangible and intangible assets.

Tangible assets, TA_{it} in (3), they are three components: plant and equipment, inventories and investment and purchased intangible. The major intangible asset, R&D capital, is represented here by the "lag structure" of annual R&D expenditures, expression (2), where R&D expenditures stretch over the preceding 4 years.

Advertising expenditures on product promotion and brand development may create an additional intangible asset for some sample firms. This may raise an omitted variable problem in expression (3), if R&D capital were the only intangible asset included. Conceptually, advertising capital can be estimated from its lag structure (current and previous expenditures), similarly to the procedure applied to R&D (expression 2). However, inspection of the data source revealed that annual advertising expenditures were occasionally missing for many

sample firms, straining the requirement for reasonable length of lag structure for reliable estimation. Considering that a procedure is frequently used by economists (e.g., Hall, 1993), in which the advertising intensity (advertising expenses over sales) is substituted for advertising capital are employed. Empirical evidence (e.g., Bublitz and Ettredge, 1989; Hall, 1993), indicated that, in contrast to R&D, the effect of advertising expenditures on subsequent earnings is short-lived, typically one to two years only. Accordingly, an advertising proxy based on annual expenditures may account reasonably well for the brand value in expression (3).

The following model (4) is used to estimate the returns on R&D, by means of least square regression. The variables are scaled (divided) by sales to mitigate the econometric problem of heteroscedasticity, due to different sizes of sample companies. The estimated model is:

$$(OI/S)_{it} = \alpha_0 + \alpha_1(TA/S)_{i,t-1} + \sum_k \alpha_{2,k}(RD/S)_{i,t-k} + \alpha_3 (AD/S)_{i,t-1} + e_{it,} \qquad (4)$$

where:

OI = annual operating income, before depreciation, advertising and R&D expenses, of firm *i* in year *t*, (sales-cost of sales)

S = annual sales in *t*,

TA = the balance sheet value of tangible assets at year *t*,

RD = annual R&D expenditures in *t*,

AD = annual advertising expense in *t*.

The model above is used, only to estimate the value of R&D capital in the company. The statistical model which is, provided here, only as supported data to make sure that the data is significant.

A.5.b. R&D Capitalization

SFAS Statement Number 86 requires that the annual amortization that is recognized should be based on the greater of the following two computations:

1. Result derived by computing the ratio of current gross revenues of the product to its current and anticipated gross revenue.
2. The straight-line method taken over the remaining estimated economic life of the product, including the period being reported on.

The system of eqs. (4a) and 4 relating earning to asset, was run cross-sectionally with the instrumental variable (industry R&D level). These estimates are used to adjust reported earning and book values of the sample companies in the subsequent year. The values of the amortization rate are defined from the average of the R&D contribution in the preceding years. The averages are used to compute a key R&D capitalization parameter – the annual amortization rates of the R&D capital, δ_k. The formula to compute the amortization expense is as follow:

$$\delta_k = \alpha_{2.k} \sum_{k} \alpha_{2.k} \qquad (5)$$

A.5.c. Adjusting the Reporting Earning and Book Values

The industry wide amortization rates δ_k, are used to compute each sample of the firm the annual R&D amortization.

$$RA_{it} = \sum_{k} \delta_k RD_{i,t,k}$$

The periodic R&D amortization is thus the sum of current and past R&D outlays. $RD_{i,t,k}$, Each multiplied by the appropriate amortization rate δ_k.

Earning adjusted for the R&D capitalization, X_{it}^{c}, are equal to reported (GAAP) earnings, X_{it}^{E}, plus the expensed R&D outlay $RD_{i,t}$, minus the R&D amortization :

$$X_{it}^{c} = X_{it}^{E} + RD_{it} - RA_{it}$$

The R&D capital at year end, RDC_{it}, each of sample firm is obtained by cumulating for each year , starting from 1998, the unamortized portion of the annual R&D expenditure:

$$RDC_{it} = \sum_{k=0}^{N-1} RD_{i,t-k}\left(1 - \sum_{j=0}^{k} \delta j\right)$$

Where N is the useful life or duration of R&D (eg. 3 – 5 years for software company). The R&D capital is thus, the sum of unamortized portion of the current year R&D outlay, $RD_{it} \times (1 - \delta_0)$, plus the unamortized portion of least year's R&D outlay which amortized twice, $RD_{i,t-1} \times (1 - \delta_0 - \delta_1)$, and so on back to the end of the useful R&D life.

CHAPTER IV
DATA AND ANALYSIS

A. Primary Data

A.1. Company Profile

Over the years, software has helped transforming the way we work and live. But it is just the beginning. What can only be imagined today will be just commonplace tomorrow. Microsoft continually does research and develop new technologies that help realizing the potential that resides within us all. Making connections where none existed before and to lead to new understanding and discoveries. To inspire, entertain, and inform.

Microsoft (Nasdaq "MSFT") is the worldwide leader in software, services and Internet technologies for personal and business computing. The company offers a wide range of products and services designed to empower people through great software – any time, any place and on any device.

Microsoft was founded as a partnership on April 4, 1975, by William H. Gates III and Paul G. Allen, and incorporated on June 25, 1981. Headquartered in Redmond, Wash., the company operates subsidiary offices in more than 60 foreign countries and employs nearly 49,000 people worldwide

Building on the popularity of the Windows operating system and the Office productivity suite, Microsoft is now focused on developing

technology for the next-generation Internet. The company's .NET platform will enable businesses to collaborate to offer an unprecedented range of integrated and customized solutions -- solutions that enable their customers to act on information wherever and whenever they need it..

A.2. Organizational Structure

Microsoft's organizational structure supports the company's increased focus on software services. The company is currently structured around the following core groups:

The **Enterprise Storage Services Group** is headed by Senior Vice President Bob Muglia, who is working to develop a cohesive product and business strategy for the evolution of Microsoft file systems, network attached storage (NAS), storage area network (SAN), backup, continuous availability and storage resource management.

The **MSN and Personal Services Group** is headed by Senior Vice President David Cole, who focuses on making it easier for consumers and businesses to connect online and to deliver software as a service on a variety of devices. PSG encompasses Microsoft's Personal .NET initiative, the Services Platform division, the Mobility group, the MSN Internet Access and the User Interface Platform division.

The **MSN & Personal Services Business Group** is headed by Vice President Yusuf Mehdi, who runs network programming, business

development, and worldwide sales and marketing for MSN and Microsoft's other services efforts, including MSN eShop, MSN Carpoint, MSN HomeAdvisor, the MSNBC venture, Slate and MSNTV.

The **Platforms Group** is headed by Group Vice President Jim Allchin, who has responsibility for continuing to evolve the Windows platform by making services -- such as storage, communication, notification, sharing photos and listening to music -- a natural extension of the Windows experience. In addition, the group includes the .NET Enterprise Server group, the Developer Tools division, the Windows .NET Product Management Group and the Windows Digital Media division.

The **Productivity and Business Services Group** is headed by Group Vice President Jeff Raikes, who drives Microsoft's broad vision for productivity and business process applications and services. PBS delivers business value by developing technologies that focus on improving productivity for Information Workers and corporations. Jeff leads an integrated team that includes Microsoft Office, Business Tools Division, Tablet PC, Information Worker Solutions Group, and Microsoft Business Solutions.

The **Worldwide Sales, Marketing and Services Group** is headed by Group Vice President Orlando Ayala, who integrates the activities of Microsoft's sales and service partners with the needs of Microsoft

customers around the world: enterprise customers, small and medium-sized organizations, educational institutions, application developers and consumers. In addition, the group includes Microsoft Product Support Services, the Network Solutions group, the Enterprise Partner group, the Central Marketing Organization and all three of Microsoft's major business-sales regions worldwide.

Microsoft Research (MSR), is headed by Senior Vice President Rick Rashid, who is devising innovative solutions to the computer science problems of today and tomorrow: making computers easier to use, designing software for the next generation of hardware, improving the software design process and investigating the mathematical underpinnings of computer science. For more details about MSR, see the

A.3. Microsoft Research

The software industry is characterized by rapid technological change, which requires constant attention to computing technology trends, and shifting consumer demand, and rapid product innovation. The pace of change is accelerating as the computing needs of our customers move beyond the PC toward intelligent devices and appliances.

During the past ten years, Microsoft Research has established a highly successful track record in technology transfer. The research applies to virtually every product Microsoft ships, from Windows 95 up to the

latest .NET products. These practical benefits are the result of an orientation that keeps us focused on the seemingly limitless possibilities of technology to make our lives, and our world, a better place. Today, they are doing the research that will help you in the near and distant future. With discoveries that will make work easier and more productive, leisure more fulfilling. Discoveries that demonstrate software is one of the greatest tools in our effort to realize human potential.

Most of the Company's software products are developed internally. The Company also purchases technology, licenses intellectual property rights, and oversees third-party development and localization of certain products. Internal development enables Microsoft to maintain closer technical control over its products and gives the Company the freedom to designate which modifications and enhancements are most important and when they should be implemented. The Company has created a substantial body of proprietary development tools and has evolved development methodologies for creating and enhancing its products. These tools and methodologies are also designed to simplify a product's portability among different operating systems, microprocessors, or computing devices. Product documentation is generally created internally.

The Company believes that a crucial factor in the success of a new product is getting it to market quickly to respond to new user needs or advances in intelligent devices, PCs, servers, and the Internet, without compromising product quality. The Company strives to become informed at the earliest possible time about changing usage patterns and hardware advances that may affect software design. Before releasing new software platforms, Microsoft provides to software vendors a range of development, training, testing resources, and guidelines for developing applications.

To serve the needs of users around the world best, Microsoft "localizes" many of its products to reflect local languages and conventions and to improve the quality and usability of the product in international markets. Localizing a product might require modifying the user interface, altering dialog boxes, and translating text. In Japanese versions, for example, all user messages and documentation are in Japanese with monetary references in the Japanese yen. Various Microsoft products have been localized into more than 30 languages.

During fiscal years 1999, 2000, and 2001, the Company spent $2.97 billion, $3.77 billion, and $4.38 billion, respectively, on product research and development activities excluding funding of joint venture activity. Those amounts represented 15.0%, 16.4%, and 17.3%, respectively, of

revenue in each of those years. The Company is committed to continue high expenditures for research and product development.

Microsoft .NET is Microsoft's platform for XML Web services. XML Web services allow applications to communicate and share data over the Internet, regardless of operating system or programming language. The Microsoft .NET platform includes a comprehensive family of products, built on XML and Internet industry standards, which provide for each aspect of developing, managing, using, and experiencing XML Web services. There are five areas where Microsoft builds .NET platform today: Tools, Servers, XML Web Services, Clients, and .NET Experiences. In the Tools area, Visual Studio .NET and the Microsoft .NET framework supply a complete solution for developers to build, deploy, and run XML Web services. They maximize the performance, reliability, and security of XML Web services. The .NET Enterprise Servers, including the Windows 2000 Server family, make up Microsoft .NET's server infrastructure for deploying, managing, and orchestrating XML Web services. Designed with mission-critical performance in mind, they provide enterprises with the agility they need to integrate their systems, applications, and partners through XML Web services, and the flexibility to adapt to changing business requirements.

In addition to developers creating XML Web services, Microsoft is creating a core set of building block services that perform routine tasks and act as the backbone for developers to build upon. The first set of XML Web services being built, codenamed "HailStorm", is a group of user-centric services oriented around people, rather than specific devices, networks, or applications. HailStorm is based upon the Microsoft Passport user authentication system. With HailStorm, users receive relevant information, as they need it, delivered to the devices they are using, and based on preferences they have established.

Clients are PCs, laptops, workstations, phones, handheld computers, Tablet PCs, game consoles, and other smart devices. These smart clients and devices use software that supports XML Web services, which enable users to access their data regardless of the location, type, and number of clients used. Smart clients and devices leverage XML Web services to create .NET experiences that allow users to access information across the Internet and from stand-alone applications in an integrated way. Some of the products that Microsoft is transitioning into .NET experiences are Office, MSN, bCentral, and Visual Studio .NET.

The recent research in the Microsoft R&D is as follow:

Ring Camera

Microsoft is developing new imaging cameras like the RingCam in order to develop software of the future to facilitate meeting recording and teleconferencing, as well as other applications in computer vision.

Notification Platform

Imagine of having the freedom and the peace of mind to go to a movie, having dinner with friends, and knowing that critical information will get through to you yet you won't be interrupted by irrelevant messages. That's the idea behind the new notification and communications technology developed at Microsoft that can serve as a virtual secretary technology. Your virtual secretary will be working for you all the time and will actually be able to learn about your interests, needs, and priorities. It can read your e-mail, update your schedule and filter messages by importance.

Face Mapping

Microsoft Research has developed a system that constructs textured 3D facial models and videos with minimal user interaction. In the future, a user, with a PC and an ordinary camera, can use this system to generate his or her facial model in just minutes, then input the image for use in online games, conference call systems, or e-commerce.

Vision Technology

Vision-based research aims to find simpler, more intuitive interfaces with computers by using live video input. The project looks at endowing computers with the potential to see and understand a user's physical actions. There are a number of consumer benefits and applications with technology that tracks users, reads lips, recognizes faces, understands expressions, interprets gestures, etc.

Improving people's lives: We believe software can make a difference.

The benefits of technology belong to all of us. Benefits that create new opportunities and open the doors to a better life. To keep those doors open, Microsoft began one of the first formal giving programs in the high-tech industry. Today no other technology company contributes more to those in need. Last year alone Microsoft and its employees gave over $215 million in cash and software to organizations that reach under-served populations and help bridge the "digital divide." As a result, more than 5,000 nonprofit organizations were empowered to better deliver their services and fulfill their missions to people and communities around the world.

A.4. Financial Statement

A.4.A. INCOME STATEMENTS

Microsoft Company
Income Statement 2001
(in thousand except for per share data)

Year Ended June 30	
	2001
Revenue	25,296,000
Operating expenses:	
Cost of revenue	3,455,000
Research and development	4,379,000
Sales and marketing	4,885,000
General and administrative	857000
Amortization R&D Expense	-
Total operating expenses	13,576,000
Operating income	11,720,000
Losses on equity investees and other	(159000)
Investment income/(loss)	(36000)
Income before income taxes	11,525,000
Provision for income taxes	3,804,000
Income before accounting change	7,721,000
Cumulative effect of accounting change (net of income taxes of $185)	(375000)
Net income	7,346,000
Basic earnings per share:	
Before accounting change	1.45
Cumulative effect of accounting change	(0.07)
	1.38

A.5.B. *BALANCE SHEETS*

]Microsoft Company
Balance Sheet 2001
(in thousand Except per share data)

	2001
Assets	
Current assets:	
Cash and equivalents	3,922,000
Short-term investments	27,678,000
Total cash and short-term investments	31,600,000
Accounts receivable, net	3,671,000
Inventories	83,000
Deferred income taxes	1,522,000
Other	2,334,000
Total current assets	39,210,000
Property and equipment, net	2,309,000
Equity and other investments	14,361,000
Goodwill	1,511,000
Intangible assets, net	401,000
Investment in R&D	
Amortization R&D Asset	
R&D	
Other long-term assets	1,038,000
Total assets	**58,830,000**

Liabilities and stockholders' equity	
Current liabilities:	
Accounts payable	1,188,000
Accrued compensation	742,000
Income taxes	1,468,000
Short-term unearned revenue	4,395,000
Other	1,461,000
Total current liabilities	9,254,000
Long-term unearned revenue	1,219,000
Deferred income taxes	409,000
Other long-term liabilities	659,000
Commitments and contingencies	
Stockholders' equity:	
Common stock and paid-in capital—shares authorized 12,000;	
Shares issued and outstanding 5,383 and 5,359	28,390,000
Retained earnings, including accumulated other comprehensive income of $587 and $583	18,899,000
R&D Capital	-
Total stockholders' equity	47,289,000
Total liabilities and stockholders' equity	**58,830,000**

A.5. Accounting Treatment for Research and Development Cost

Technological feasibility for Microsoft's software products is reached shortly before the products are released to manufacturing. Costs incurred after technological feasibility is established are not material, and accordingly, the Company expenses all research and development costs when incurred.

A.6. Company Vision and Mission

Microsoft's Mission

To enable people and businesses throughout the world to realize their full potential

Microsoft's Vision

Empowering people through great software – any time, any place and on any device

Delivering on the Mission

The tenets central to accomplish our mission include:

Great People with Great Values

Delivering on the mission requires great people who are bright, creative and energetic, and who share the following values:

- Integrity and honesty
- Passion for customers, partners, and technology

- Open and respectful with others and dedicated to making them better
- Willingness to take on big challenges and see them through
- Self critical, questioning and committed to personal excellence and self improvement
- Accountable for commitments, results, and quality to customers, shareholders, partners and employees

Excellence

In everything

Trustworthy Computing

Deepening customer trust through the quality of our products and services, our responsiveness and accountability, and our predictability in everything we do.

Broad Customer Connection

Connecting with customers, understanding their needs and how they use technology, and providing value through information and support to help them realize their potential.

Innovative and Responsible Platform Leadership

Expanding platform innovation, benefits, and opportunities for customers and partners; openness in discussing our future directions;

getting feedback; and working with others to ensure that their products and our platforms work well together.

Enabling People to Do New Things

Broadening choices for customers by identifying new areas of business; incubating new products; integrating new customer scenarios into existing businesses; exploring acquisitions of key talent and experience; and integrating more deeply with new and existing partners.

A Global, Inclusive Approach

Thinking and acting globally, enabling a multicultural workforce that generates innovative decision-making for a diverse universe of customers and partners, innovating to lower the costs of technology, and showing leadership in supporting the communities in which we work and live.

B. Analysis and Research Founding

Table IV.1
Derivation of annual amortization rates of R&D for 2001 software company industry

$$(OI/S)_{it} = \alpha_o + \alpha_1(TA/S)_{i,t-1} + \sum_k \alpha_{2.k}(RD/S)_{i,t-k} + \alpha_3 (AD/S)_{i,t-1} + e_{it.}$$

Year	No. of Firm	α_0	α_1	α_3	$\alpha_{2.0}$	$\alpha_{2.1}$	$\alpha_{2.2}$	$\alpha_{2.3}$	$\sum \alpha_{2.k}$	R^2
1997	74	0.339	0.163	0.367	0.354	0.293	0.235	0.178	1.060	0.587
1998	74	0.560	0.165	0.571	0.427	0.376	0.214	0.198	1.215	0.654
1999	74	0.575	0.160	0.369	0.174	0.752	0.426	0.358	1.710	0.991
2000	74	0.607	0.174	0.438	0.384	0.154	0.323	0.304	1.165	0.628
Mean					0.335	0.394	0.300	0.260	1.288	
R&D (d)* Amor.Rate					0.260	0.306	0.233	0.202		

*The R&D amortization rates are calculated from the mean R&D coefficient $\alpha_{2.k}$ (k = 0, ...3) as follow $\delta_k = \alpha_{2.k} / \sum_k \alpha_{2.k}$

Information in the table explains about the cross relationship between R&D expense in the operating income of software companies. Around 74 company data are taken which criteria are same as the explanation above. The α_1 explains about the contribution of tangible asset to the operating income. α_3 explain about the contribution of advertising expense to the operating income. α_2 explain about the total contribution of research and development expense (in the software financial statement also call product development expense) to the operating income.

All the coefficients, except of the intercept are statistically significant at the 0.05 level or better (see appendices).

B.1. Return on Physical and Advertising Capital

The interpretation of the estimated coefficients in Table 1 is as a dollar contribution to operating income. This is appropriate since all the variables (dependent and independent) in the estimated model (4) are scaled (divided) by the same variable—sales. Accordingly, given the level of sales, a dollar increase in the value of an independent variable (R&D, or physical assets), will be associated with an increase in operating income equal to the estimated coefficients, α.

The estimated coefficient, 0.174, presented at the top of Table 1, indicates that a dollar of 2000 tangible asset (investment, plant and equipment, Goodwill, purchase technology) assets of software companies contribute, on average, $0.174 to 2000 operating income.

The estimated return on advertising, 0.438 second coefficient in Table 2), this indicate that a dollar of 2000 advertising contribute, on average, $0.438 to the income. We caution against drawing far-reaching inferences from this estimate, since the reporting of advertising expenditures by software company is incomplete (e.g., some companies lump this item with administrative expenses, than we explore that the advertising expense is 40% from the selling and administrative expense), and the content of this item is probably inconsistent across companies.

B.2. Capitalizing R&D—the Focus of Analysis

Table IV.2
Estimates of R&D Productivity
(From the Model 4)

Input	Contribution to operating income
Physically asset	**0.174**
Advertising	**0.438**
R&D:	
Current year	**0.384**
Preceding year	**0.154**
Year 1	**0.323**
Year 2	**0.304**
Total R&D contribution	**1.165**

From the value of R^2 (table 1), we see that there is significant relationship between operating income (OI), tangible asset (TA) and advertising expense (Adv) and R&D expenditure (R&D) Following is an explanation of the estimation model and its parameters (table 1 and 2). This underlies model (4), where operating income in a given year is related to (a function of) the firm's R&D expenditures in that year, as well as R&D expenditures in each of the preceding eight years. The four R&D coefficients to be estimated by the econometric technique, $\alpha_{2,k}$, reflect the contribution to current operating income of each vintage of R&D expenditures. Thus, for example, an $\alpha_{2,0}$ of 0.384 (Table 2) indicates that a dollar R&D spent in the current year (year 0) increases current operating income by \$0.384. Similarly, an estimated value of $\alpha_{2.3}$ of 0.304 (Table 2) indicates that a dollar R&D spent four years ago increases current operating income by \$0.304.

Once, after having estimated the contribution to income of each vintage of R&D (we examine four annual vintages), the next estimation is the total contribution of a dollar R&D to current and future income by adding up the annual contributions.

The length of the statistically significant lagged R&D coefficient $\alpha_{2.k}$ Table 1 indicates the average duration of R&D benefits (useful life of R&D capital). Thus the benefits in software company are range from 3 to 5 years, in chemical and pharmaceutics, the average useful life of R&D is the longest nine years (Lev, 1996:120).

The sum of the significant R&D coefficient $\sum \alpha_{2.k}$ (table 2), reflect the total (undiscounted effect) of $1 invested in R&D on current and future operating income. For example, based on the 2000 estimation (table2), the average contribution to operating income of $1 invested by software companies was $1.165 in four years.

The estimated regression coefficient for each of the years 1998 - 2000 are averaged and reported in the second bottom of table 1. These averages are using a key R&D capitalization parameter - the annual amortization rates of the R&D capital (explain above). The R&D amortization in year *k* is thus the ratio of that year's benefit expired, the $\alpha_{2.k}$, to total benefits $\sum \alpha_{2.k}$. For example, the amortization rate of current year (year 0) R&D expenditures, δ_0, is 0.335/1.288 = 0.260. Thus, on

average, in the software industry (the period 1988 -2001), the amortization rate of current R&D expenditure was 26%.

The amortization rates of preceding year's (year 1) R&D expenditure were 30.6%. Accordingly, the amortization rate for 2000 consist of 30.6% of 2000 R&D expenditure and so on back in time over all vintage are still contribution to year *t* earning. The annual amortization rates, bottom line of table 1, are used to compute both R&D capital and its amortization for 2001.

B.3. Adjusting Reported Earning and Book values

After founding the value of research and development and its capitalization, the next step is adjusting the reported earning and the book value. As explained above, each R&D coefficient is used to determine the estimated both R&D capital and amortization rate annually. Table 3 will explain the income before capitalizing R&D.

Table IV.3.
Microsoft Reported Financial Data
(in thousand)

Year	Earning	R&D Expense	Equity
1998	4490000	2897000	16627000
1999	7785000	2970000	28438000
2000	9421000	3772000	41368000
2001	7346000	4379000	47289000

Source : SEC filling (Microsoft Financial Data). Available at www.Edgar.com

The value of the earning is earning after income tax or net income. Form the table; we see that there is an increase in net income as long as R&D expense increases except for 2001. In 2001 net earning of the company is before capitalizing R&D expense was $7,346,000,000.00 Return on equity was 16%, this amount come from the earning divided by the net equity in the company financial statement.

The income of the company increases as long as the R&D expense increase. Except for 2001, the income of the Microsoft company was decrease because high increase on the operating expense and also cost of revenue.

As, mention before, the statistical regression are use to determine the value of amortization of R&D. The amortization in year *k* is thus the ratio of that year's benefit *expired*. For 2001, the amortization rate of R&D capital (the proper expense rather than the GAAP) expense consist of 26.0% of the 2001 R&D expenditures, plus 30.6% of the 2000 R&D expenditure plus 23.3% of 1999 R&D expenditures, and 20.2% of 1998 R&D expenditure. The complete computation of 2001 R&D amortization and capital are as follow:

$$RA_{it} = \sum_{k} \delta RD_{t,k}$$

= (0.26.0 x 4379000 + 0.306 x 3772000 + 0.233 x 2970000 + 0.202 x 2897000) x (1000)

= $ 3,566,898,000

R&D capital, RDC_{it}, for 2001 ($5,476,781 thousand), is calculated as follows:

RDC_{it} = ((1 – 0.260) x 4379000 + (1 – 0.260 - 0.306) x 3772000 + (1 – 0.260 – 0.306 – 0.233) + (1 - 0.260 – 0.306 – 0.233 – 0.202) x 2897000)) x 1000

= $ 5,476,781,000

The coefficient 0.254, 0.329 .... Are the amortization rates, $\delta_{2,k}$. for the software company industry presented in table 1.

Income under capitalization X_{it}^{C} = Reported Net Income X_{it}^{E} + reported R&D expenditure (RD_{it}) – R&D amortization (RA_{it})

Equity under Capitalization (BV_{it}^{C}) = Reported Equity (BV_{it}^{E}) + R&D capital (RDC_{it})

C. The Effect of R&D Capitalization

C.1. The Effect on Earnings

The amount of R&D capital above is the amount calculated from the contribution of R&D each year. From the 2000, the estimated contribution of the R&D to the operating income was 1.165, it means from the 1997 – 2000 the total contribution of the $1 R&D to operating income

was 1.165. From the table 4 we see that there is substantial impact of the above adjustment on the sample firm reported data.

Table IV.4
Comparison earning Between R&D Capitalization and Expense for Fiscal year 2001

	Amount
Expensing	7,346,000,000
Capitalizing	8,158,102,000
Difference	812,102,000

The average (over firm and years) understatement of reported earning due to R&D expensing (i.e. the percentage X_{it}^{c} and reported X_{it}^{E}, earnings) for Microsoft company is about 11 percent. The Microsoft earning understatement from and for 2001 the understatement of Microsoft earning is $812,102,000.

Summarizing from information stated on table 5 above, we can see that capitalizing research and development cost increase the earning of the Microsoft Company.

C.2. The Effect on Book Value

Table IV. 5
Comparison equity between R&D under capitalization and R&D under expensing

Equity	Amount
Expensing	47,289,000,000
Capitalizing	52,765,781,000
Difference	5367142
ROE Exp.	0.16
ROE Cap.	0.22

Table 6 explains to us about the Microsoft total equity under capitalization and under expense. From the table, equity based on immediate expensing of R&D (current GAAP) will be lower than equity of R&D capitalization. Capitalizing R&D cost increase the total equity for 11% in 2001.

C.3. Effect on Company Performance

Information from financial statement can be gathered by examining relationship between items on the statements and identifying trends in these relationships. The relationships are expressed in ratios and percentage, and trends are identified through comparative analysis (Kieso & Weygant 1995:1302). Also beside that the relationship are used for making investment decision. Although many factor beside financial statement have special effect, but the information from the financial statement of the company is crucial making decision.

Some ratios are used to calculate the company performance. But in this thesis, the researcher only focuses on the ratio which effected by the capitalization of R&D. As mention above, the main effect of R&D capitalizing is increasing book value of the company and also the earning of the company, so in this case, the big effect of R&D capitalization is on profitability ratio. Profitability ratio are measure the degree of success or failure of a given enterprise in a given period of time (*ibid*). Table 7 is the information about how R&D capitalization affected the ratio analysis.

Table IV. 6
Comparison between Ratio Analyses Expensed vs. Capitalized of 2001

Profitability Ratio	Expensed	Capitalized
Profit Margin	27%	34%
Earning Per Share	1.38	1.46
Return On Equity	16%	22%

As seen in the explanation, the capitalization of research development causes significant increase in earnings. This increase makes the profitability ratios on capitalizing R&D is higher than expensing R&D. As shown in table above, Profit margin are increase from 29% to 34% in 2001; and is the same as the earning per share which increase from $1.380 to 1.460.

Same with the ROE, ROE under capitalizing R&D will be higher than R&D under expensing (as expected) except for 2001, ROE under expensing is below the R&D under capitalizing, although is not higher than preceding year, the understatement of the equity is significant for this company.

All explanation about the effect of R&D capitalizing is stated on the Microsoft financial statement in the table 7 and 8. In the table explain about what might be changed (in value) if the research and development expense are capitalizing.

Table IV.7
Microsoft Company
Income Statement 2001
(in thousand except for per share data)

Year Ended June 30	Expense	Capitalize
	2001	2001
Revenue	25,296,000	25,296,000
Operating expenses:		
Cost of revenue	3,455,000	3,455,000
Research and development	4,379,000	-
Sales and marketing	4,885,000	4,885,000
General and administrative	857,000	857,000
Amortization R&D Expense	-	3,566,898
Total operating expenses	13,576,000	12,763,898
Operating income	11,720,000	12,532,102
Losses on equity investees and other	(159000)	(159000)
Investment income/(loss)	(36000)	(36000)
Income before income taxes	11,525,000	12,337,102
Provision for income taxes	3,804,000	3,804,000
Income before accounting change	7,721,000	8,533,102
Cumulative effect of accounting change (net of income taxes of $185)	(375000)	(375000)
Net income	7,346,000	8,158,102
Basic earnings per share:		
Before accounting change	1.45	1.53
Cumulative effect of accounting change	(0.07)	(0.07)
Earning per-share	1.38	1.46
Weighted Average Shares Outstanding	5,341,000	5,341,000

Table IV.8
Microsoft Company
Balance Sheet 2001
(in thousand Except per share data)

	Expense		Capitalize
	2001		**2001**
Assets			
Current assets:			
Cash and equivalents	3,922,000		3,922,000
Short-term investments	27,678,000		27,678,000
Total cash and short-term investments	31,600,000		31,600,000
Accounts receivable, net	3,671,000		3,671,000
Inventories	83,000		83,000
Deferred income taxes	1,522,000		1,522,000
Other	2,334,000		2,334,000
Total current assets	39,210,000		39,210,000
Property and equipment, net	2,309,000		2,309,000
Equity and other investments	14,361,000		14,361,000
Goodwill	1,511,000		1,511,000
Intangible assets, net	401,000		401,000
Investment in R&D			9,043,679
Amortization R&D Asset			(3,566,898)
R&D			5,476,781
Other long-term assets	1,038,000		1,038,000
Total assets	**58,830,000**		**64,306,781**

Liabilities and stockholders' equity			
Current liabilities:			
Accounts payable	1,188,000		1,188,000
Accrued compensation	742,000		742,000
Income taxes	1,468,000		1,468,000
Short-term unearned revenue	4,395,000		4,395,000
Other	1,461,000		1,461,000
Total current liabilities	9,254,000		9,254,000
Long-term unearned revenue	1,219,000		1,219,000
Deferred income taxes	409,000		409,000
Other long-term liabilities	659,000		659,000
Commitments and contingencies			
Stockholders' equity:			
Common stock and paid-in capital—shares authorized 12,000;			
Shares issued and outstanding 5,383 and 5,359	28,390,000		28,390,000
Retained earnings, including accumulated other comprehensive income of $587 and $583	18,899,000		18,899,000
R&D Capital	-		5,476,781
Total stockholders' equity	47,289,000		52,765,781
Total liabilities and stockholders' equity	**58,830,000**		**64,306,781**

C.4. The Effect on Financial Statement Quality

From the regression result in the table 1, we found that there is significant relationship between R&D and the current and the future income. This result explained to us that by capitalized R&D on financial statement there certain benefit to financial statement users. Accelerate growth in technology, information and economy makes intangible especially R&D became very important for the company. By capitalizing R&D alleviates some deficiencies from of expensing intangible such as R&D cost.

How will the reporting deficiencies be alleviated by the proposed capitalization of intangibles especially for R&D? First, such capitalization will improve the periodic matching of costs and benefits, particularly for firms with high growth rates of intangible investment. This will lead to reported earnings which more meaningfully reflect enterprise performance than currently measured earnings. Second, the capitalized intangibles will be reported on corporate balance sheets, placing intangible assets in a common footing with tangible assets. The amortization and write-offs of these assets will convey valuable information about managers assessment of the expected benefits of intangibles. Third, the capitalization of intangibles is a crucial step in providing a basis for evaluating the success of innovative activities. Data

on the investment in intangibles classified by homogeneous product/activity groups and coupled with a breakdown of revenues and gross margins attributable to the intangibles will enable investors to assess the return on investment in research, product development and brand enhancement. This important objective of capitalization-- allowing for the assessment of return on investment -- is often overlooked by those who object to capitalization on the grounds that most intangibles are not traded, or because the cost of intangibles often differs from current values. (Zarowin & Lev, 1999:47).

On the downside, capitalization of intangibles obviously increases the possibilities of earnings management. However, in contrast with other means of earnings management, such as the early recognition of revenues or an exaggerated restructuring charge, intangibles capitalization is clearly and separately disclosed in the financial reports, allowing skeptical investors to easily reverse the capitalization. Thus, at best, intangibles capitalization is a vehicle for managers to share with investor's information about the progress and success of innovation-producing activities. At worst, capitalization can be reversed, thereby returning the financial reports to their current (full expensing) status.

CHAPTER V

CONCLUSIONS, IMPLICATION AND SUGGESTION

A. CONCLUSIONS

The following major conclusions can be drawn from the evidence presented previously:

1. From the research result, the effect of capitalizing R&D on Microsoft Financial statement is increasing company earning for 11% in average and $ 8,158,102,000.00 in 2001.
2. The R&D capitalization will increase book value (ROE) of the company from 16% to 22% and increases profit margin from 27 to 34% and earning per share increases from $1.380 to $1.460.

   These statements (point 1 and 2) are in accordance with the statement explained by Baruch Lev and Theodore Sougiannis in their research about the valuation of R&D. They state that capitalization of R&D value will increase the operating income and book values (*Lev & Sougiannis*.1996:107-138).
3. The capitalization R&D will improve the quality of financial statement by elevating the deficiency of R&D under expense financial statement in three ways; first improving the periodic matching of costs and benefits; second reporting in the balance

sheet convey valuable information about managers assessment of the expected benefits of intangibles; third capitalization of intangibles is a crucial step in providing a basis for evaluating the success of innovative activities.

4. The R&D capitalization process developed here yield statistically reliable estimates of the amortization rates of the R&D capital. These amortization rates are used to compute firm – specific R&D capital and adjust the reported earnings and equity (book) values to reflect the capitalization of R&D.
5. The major outcomes of these adjustments – the correction to the reported earning and book values – to find the effect of capitalizing R&D in the Microsoft company financial statement.
6. The way of analysis is by comparing between the R&D under expense and R&D under capitalization on the Microsoft Company.

B. Research Implication

1. Theoretical

The accounting standard for recorded research and development account are to expense the research and development when incurred. This activity makes the value of the research and development is zero and when there is acquisition, there is understatement for research and

development account, and of course it is a big loss for the company being acquisition. Several studies have proved that the R&D has significant relationship to the earnings, such Lev who states that expensing R&D creating deficiencies of financial statement. Lev and Sougiannis 1996 implies that R&D capitalization will improve the alignment of book values with intrinsic values.

The capitalizing is important to prevent understatement (earning, BV, and profitability ratios) and allows management to convey important inside information about the progress and success of the development of program. Indiscriminate capitalization of all past R&D expenditures does not provide such information.

2. Practical Implication

Expenditure on R&D generates value, which is clearly owned by the company, so it is reasonable to regard such expenditure as investment. True, the economic value is uncertain, but the same can be said of any investment, including the value of city center office buildings, as many investors have learned the hard way in recent years.

This research provides information about the effect of capitalizing R&D in the financial statements. From the research result, we know that R&D has significant value in effecting the company profit in the future, so it's better to treated R&D as asset rather than to expense it. The method

which explains in this thesis can be uses as based for measuring R&D capital in the company, to create reliable and relevance financial statements to the related parties.

C. Limitations and Further Research Suggestions

From the research, there are several limitations:

- The estimated value of research and development capital is derived from the production function. This model in fact focuses on the impact of R&D on the profit margin of software companies (the dependent—left hand—variable in model (4) is the ratio of operating income to sales). (Abody &Lev 2001:19).
- R&D is a continuous process; the value we derive here is the value for one year (2001) if the R&D expense is capitalized. This is happened because the limitation of the data from the related resources (e.g. SEC & PRARS)
- Since R&D investment and its consequences seem largely unrelated to non-operating items (e.g. financing charges) this research did not control the other expense other than amortization.
- Company has important role to make decision about the estimating future R&D value and the amortization rate.

- The other factor, such as additional scientist or big changes in state economic situation not included as the factor to count R&D capital.
- Since the advertising expense is not presented in the financial statement (Adv. Expense is included as part of selling and administration expense) the estimation of adv. expense are 40% from selling and administrative expense. (*ibid*)
- This research is only for companies which have 4 years estimated R&D capital (Software Company). The effect on another company which has R&D estimated live more than 4 years (chemical estimated live have 9 years or electrical industry 8 years), the effect might be different.
- This research did not explore the R&D capitalization effect on the stock price or market value.

From the limitation above, the researcher recommend to make following research about R&D on another kind of company with another method which more complete than this method. Also is highly recommended to find the effect of capitalizing R&D on the market value or stock price or to study about the research and development of accounting in our country

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Appendices

Software Financial Data
Fiscal Year 1997

No.	Company Name	Tangible Asset	Revenue	R&D Expense	Adv. Expense	Operating Income*
	(In Thousands)					
1	**AcclaimEntertainment Inc.**	46505	165411	41689	50439	95071
2	Adobe System Inc.	416603	911894	176558	151450	558764
3	American Online Inc.	715297	1685000	79000	88800	272800
4	American Software Inc.	49984	84711	7343	8324	17348
5	Ansoft	10379	14188	2993	3176	8721
6	Applix	14574	48498	8661	11101	22270
7	Artisoft	7367	33409	9300	9354	23868
8	Aspentech	66741	194070	33580	22414	75169
9	Bindview	13335	20838	3573	3635	13020
10	BMC	392877	791939	113795	104515	461144
11	Brio	6481	13386	2447	5435	12872
12	Ceridian Inc.	393470	1053500	59200	80760	185160
13	Cirrus	282036	917154	230786	50689	291689
14	Click2Learn	10826	25705	8423	5882	16771
15	Computer Associates Inc.	1037310	4040000	377000	586000	2319000
16	Corel	54946	260581	89499	65616	230486
17	Datawatch	2418	32047	2804	6090	20276
18	Digital Insight	2021	3972	1612	1006	3005
19	Dacocorp	12024	17503	4956	898	6914
20	eGames	906	4382	415	1599	3664
21	Evan & Sutherland	41325	159353	25492	14133	74014
22	Graphon Inc.	363	1463	191	461	872
23	Immersion	1852	4332	586	1329	2492
24	Informax	1476	2202	365	430	1016
25	Info Space	1289	1685	213	332	995
26	Intellic Corp	5156	12686	3771	2670	9194
27	Interactive Intelligent	2095	5590	2118	1304	4371
28	Interplay Entertainment Corp.	10289	85961	14291	11837	27406
29	Interwoven Inc	1448	3168	884	860	2154
30	Intrado Inc	18988	27072	738	2831	8352
31	J D A Software Group Inc	51467	91771	11364	8755	39766
32	Kronos Incorperated	32426	170538	16538	27776	62602
33	Logility Inc	17296	21824	3484	5254	10732
34	Macromedia Inc.	46047	107365	30013	27105	73038
35	Manhatan Ascosiated Inc	10685	32457	3025	2618	13921
36	Mapics	17299	95404	10259	16064	49653
37	Mapinfo Corperation	12473	47393	9020	11960	31244
38	Mediaware Information Sys.	4655	18903	2115	3439	7720
39	Mentor Graphic Corp.	137027	454727	112227	80392	218989
40	**Microsoft**	3811000	11358000	1925000	1287200	8083200
41	Modlflow Corporation	4186	14823	3527	4177	9111

42	MRO Software Inc	20357	1271	11387	6634	19292
43	Neomedia Technology Inc.	1729	24434	752	3622	6425
44	Net Guru Inc	4920	11023	1898	3144	5507
45	Network	224667	735692	103051	42111	219975
46	Nuance	3510	4382	2622	1294	4474
47	Onyx Software Corporation	15451	19437	4729	5273	11748
48	Optimal Robotics Corp	2792	3397	294	944	1619
49	Optio Software Inc.	5639	9002	891	1927	3656
50	Pumatech	13237	15629	6236	2442	9347
51	Q A D Inc	17309	126444	25434	27653	55807
52	Quadramed Corporation	21411	99625	32878	14508	51866
53	Radview Software Ltd.	1843	5254	1481	576	2934
54	Rainbow Technology Inc	33246	94724	8424	8694	36443
55	Rational Sofware Corporation	13581	145373	24445	27061	67918
56	Realnetwork Inc.	14163	32720	13268	10459	25043
57	Roguewave Software Inc.	25696	33409	7619	7183	17698
58	Sapient Corp.	20100	90360	43816	11200	72999
59	Serena Software Inc.	8807	17454	4321	2760	8106
60	Smartdisk Corp	2757	5412	1412	1278	3508
61	SPSS Inc	19760	134861	21132	35379	58970
62	SS & C Technology Inc.	30543	42192	10245	7944	18838
63	Serviceware Technoly Inc.	1394	2473	809	1359	1703
64	Stelent Inc.	1170	2010	1115	2691	368
65	Synopsys Inc.	338745	646956	152113	115156	381437
66	Tarantella Inc.	38827	193660	46130	40054	92778
67	TDK Mediactive	1842	4597	1596	1375	1303
68	Teknowledge Corp.	2186	11094	207	1063	1924
69	T C S I Corporation	18948	39578	5932	7425	6281
70	Timberline Software Corp.	11704	35240	7264	4451	18215
71	Timeline Inc	1640	5503	1415	1798	522
72	Unisys Corp	1166372	6636000	302300	570880	693640
73	Voxware Inc.	2926	7428	3796	2889	3104
74	Yahoo! Inc.	40274	59565	12082	21268	2568

**Operating Income before R&D and advertising expense*

42	MRO Software Inc	20357	1271	11387	6634	19292
43	Neomedia Technology Inc.	1729	24434	752	3622	6425
44	Net Guru Inc	4920	11023	1898	3144	5507
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71	Timeline Inc	1640	5503	1415	1798	522
72	Unisys Corp	1166372	6636000	302300	570880	693640
73	Voxware Inc.	2926	7428	3796	2889	3104
74	Yahoo! Inc.	40274	59565	12082	21268	2568

**Operating Income before R&D and advertising expense*

Software Company Financial Data
Fiscal Year 1998

No.	Company Name	Tangible Asset	Revenue (Sales)	R&D Expense	Advertising Expense	Operating Income*
	(In Thousands)					
1	Acclaim Entertaiment	54157	326561	37367	46336	177901
2	Adobe System Inc.	485156	894791	207339	165769	783354
3	American Online	833000	3114000	337000	251600	1289000
4	American Software Inc.	58209	107472	12112	10366	60209
5	Ansoft	12087	26283	7299	5057	20353
6	Applix	16972	50180	8709	10288	39978
7	Artisoft	6250	24793	7053	4018	18284
8	Aspentech	77723	252555	43553	29970	177881
9	Bindview	15529	39827	11706	10166	37620
10	BMC	457525	985250	124757	126911	879506
11	Brio	7548	26772	5218	9091	23169
12	Ceridian Inc.	458216	1141400	76900	123800	858426
13	Cirrus	328445	954270	179552	46909	448786
14	Click2Learn	12607	33352	6113	5660	18935
15	Computer Asciates Inc.	1208000	4206000	369000	700400	3086400
16	Corel	63987	246827	71935	47825	195266
17	Datawatch	2816	25296	3383	9810	20083
18	Digital Insight	2353	8230	2827	3814	5331
19	Dacocorp	14002	45247	8318	2382	26215
20	eGames	1055	9275	397	1599	5834
21	Evan & Sutherland	48125	191766	31797	16035	81446
22	Graphon	423	2124	870	576	1463
23	Immersion	2157	6749	2168	1519	5150
24	Informax Inc.	2883	4126	1162	990	2855
25	Info Space	25142	58246	9005	9557	45253
26	Intellic Corp	6004	24445	5818	3973	17825
27	Interactif Intelegence	2440	9011	4065	2649	5571
28	Interplay Entertainment Corp.	11982	126862	24472	25577	54934
29	Interwoven Inc	1686	4003	1579	1222	2757
30	Intrado Inc	22112	34449	1376	3631	23125
31	J D A Software Group Inc	59936	138463	39171	14999	71315
32	Kronos Incorperated	37762	202469	19700	32736	126076
33	Logility Inc	20142	34662	5592	6715	24098
34	Macromedia Inc.	53624	113803	44487	29444	98089
35	Manhatan Ascosiated Inc	12443	62065	9031	6310	54068
36	Mapics Inc	20145	129741	15073	25710	101760
37	Mapinfo Corperation	11646	60603	10231	13450	47030
38	Mediaware Information Systems	5421	20530	2527	3423	14590

39	Mentor Graphic Corp.	159575	490393	117853	97944	366896
40	Microsoft	10431000	15262000	2897000	1304400	12802000
41	Modlflow Corporation	4875	18524	3062	4236	15295
42	MRO Software Inc	46998	120016	22419	18889	54210
43	Neomedia Technology Inc.	2014	23478	1069	5940	11887
44	Net Guru Inc	5730	17408	2566	3695	12401
45	Network Asociates Inc.	261636	990045	135475	151503	498327
46	Nuance Communication	8746	12454	6615	3831	8656
47	Onyx Software Corporation	17993	35110	8782	9360	25973
48	Optimal Robotics Corp	3251	5618	210	1853	1482
49	Optio Software Inc.	6567	13569	1551	3115	10267
50	Pumatech	15415	22308	9876	3940	19231
51	Q A D Inc	20157	170770	29317	34083	129219
52	Quadramed Corporation	24934	159394	30403	16256	76348
53	Radview Software Ltd.	2146	4966	1408	763	4529
54	Rainbow Technology Inc	38717	109232	11681	10551	53711
55	Rational Sofware Corporation	15816	310670	61560	67120	247605
56	Realnetwork Inc.	51430	64839	20828	16917	52449
57	Roguewave Software Inc.	29924	44439	9532	9391	37142
58	Sapient Corp.	23407	164872	41643	11178	160372
59	Serena Software Inc.	10256	32147	5518	4497	25334
60	Smartdisk Corp	10198	15322	2107	2478	2722
61	SPSS Inc	23011	158991	25233	39095	111339
62	SS & C Technology Inc.	35569	69413	17440	9368	48441
63	Serviceware Technoly Inc.	3952	12923	5298	4000	11494
64	Stelent Inc.	8350	22211	2196	3042	15220
65	Synopsys Inc.	394486	717940	187476	117022	624173
66	Tarantella Inc.	45216	171900	41393	39281	124804
67	T D K Mediactive Inc.	2145	8867	1580	1683	2768
68	Teknowledge Corp.	2546	12200	132	1295	5956
69	T C S I Corporation	22066	42320	12311	6466	38225
70	Timberline Software Corp.	13630	44293	8863	4900	28746
71	Timeline Inc	1910	3383	776	803	2364
72	Unisys Corp.	1358300	7208400	296600	537200	5449800
73	Voxware Inc.	3408	5882	2726	1524	5299
74	Yahoo! Inc.	81838	176528	22742	41436	94976

**Operating Income before R&D and advertising expense*

Software Company Financial Data
Fiscal Year 1999

No.	Company Name	Tangible Asset	Revenue	R&D Expense	Adv. Expense	Operating Income
	(In Thousands)					
1	Acclaim Entertainment Inc.	69458	430974	50452	54626.8	229994
2	Adobe System Inc.	767331	1015434	201056	172850.8	920894
3	American Online	1149000	4804000	292000	326400	2135000
4	American Software Inc.	43839	109177	22413	11543.6	45242
5	Ansoft	20165	24475	8391	6824.4	18256
6	Applix	29795	36871	7101	7982.8	32145
7	Artisoft	7563	22304	5385	15449	18248
8	Aspentech	100352	226519	48625	34265.6	134715
9	Bindview	18524	71739	19298	13989.6	67885
10	BMC	801078	1303900	181500	167080	1151900
11	Brio	18368	46524	7180	12969.2	39582
12	Ceridian Inc.	171600	1317100	73600	148840	691100
13	Cirrus	234512	628105	149756	40722.8	28088
14	Click2Learn	13261	34733	7425	18656	15220
15	Computer Asciates Inc.	1906000	4666000	423000	815200	3442200
16	Corel	66137	243051	40049	52077.2	183535
17	Datawatch	3383	27171	2386	8918.8	21023
18	Digital Insight	23384	26245	7772	8900	10563
19	Dacocorp	10484	51926	9492	3374.8	30968
20	eGames	1529	10023	937	1925.6	6425
21	Evan & Sutherland	52665	200885	44358	17215.6	73329
22	Graphon	937	3634	870	571.6	1780
23	Immersion	6032	10942	5518	1418.8	7978
24	Informax	1656	10014	2597	2800	7997
25	Info Space	201538	71980	15580	31110.8	58508
26	Intellic Corp	3643	21961	5922	4695.6	11629
27	Interactif Intelegence	9461	19081	6967	5179.2	13159
28	Interplay Entertainment Corp.	10300	101930	18155	20234.8	40827
29	Interwoven Inc	83079	16806	4199	7521.2	10409
30	Intrado Inc	24664	32584	1740	4098	28142
31	J D A Software Group Inc	54410	142663	25000	16733.6	70101
32	Kronos Incorperated	66274	254298	26802	40314	163499
33	Logility Inc	13913	27017	6165	7523.6	16922
34	Macromedia Inc.	115755	149886	35644	31033.2	135600
35	Manhatan Ascosiated Inc	29465	81292	10201	10877.2	60258
36	Mapics Inc	25454	134718	18083	27725.6	65468.6
37	Mapinfo Corperation	20987	74356	11253	16692.4	58714
38	Mediaware Information Systems Inc	3412	28339	7806	5011.2	19913
39	Mentor Graphic Corp.	150717	511134	116867	87808	393080
40	Microsoft	15432000	19747000	2970000	1568000	16933000
41	Modlflow Corporation	3754	20221	3466	5404.8	18524

42	MRO Software Inc	48827	145665	14959	23432	98337
43	Neomedia Technology Inc.	5874	25256	986	4818.4	12546
44	Net Guru Inc	5810	10745	2415	3052	9595
45	Network	369461	683668	152728	181535.6	557213
46	Nuance Communication	15612	19567	11793	14107	6751
47	Onyx Software Corporation	4880	60574	10432	14133.6	46365
48	Optimal Robotics Corp	5876	29634	220	2450.4	6176
49	Optio Software Inc.	10249	19539	2530	4167.2	14537
50	Pumatech	17163	20043	11099	4370.4	18744
51	Q A D Inc	25717	193344	48332	46595.6	134329
52	Quadramed Corporation	32218	175461	26089	27520.4	116565
53	Radview Software Ltd.	2458	5110	1705	2816.4	4703
54	Rainbow Technology Inc	39664	121089	10863	13188	82446
55	Rational Sofware Corporation	124221	411816	71869	82543.2	226333.2
56	Realnetwork Inc.	111800	131242	38415	27938	98546
57	Roguewave Software Inc.	26103	53104	11512	11545.6	43649
58	Sapient Corp.	79849	276844	84638	36326.8	167984.8
59	Serena Software Inc.	5290	48316	4465	7117.6	38053
60	Smartdisk Corp	3111	40319	5869	1294.8	15499
61	SPSS Inc	26663	181453	30465	45225.2	164953
62	SS & C Technology Inc.	50485	65736	18655	12830.4	37979
63	Serviceware Technoly Inc.	2995	17652	6849	5807.2	13164
64	Stelent Inc.	1224	17031	2214	3727.6	10390
65	Synopsys Inc.	578226	829280	205417	125393.6	715136
66	Tarantella Inc.	53260	223624	42376	46038.8	173846
67	T D K Mediactive Inc.	3318	4625	1357	1602.4	2543
68	Teknowledge Corp.	1890	11095	599	1168.8	6045
69	T C S I Corporation	37274	55114	10624	5596.8	50321
70	Timberline Software Corp.	23669	55114	10624	5596.8	50321
71	Timeline Inc	1060	3401	656	770.4	2460
72	Unisys Corp.	1228800	7544600	339400	553840	2684700
73	Voxware Inc.	4795	2886	2058	1681.6	1915
74	Yahoo! Inc.	413480	591786	72368	106568.4	498605

**Operating Income before R&D and advertising expense*

Software Company Financial Data
Fiscal Year 2000

No.	Company Name	Tangible Asset	Revenue	R&D Expense	Advertising Expense	Operating Income*
	(In Thousands)					
1	**Acclaim Entertainment Inc.**	46863	188626	57410	51204	83230
2	**Adobe System Inc.**	507255	1266378	24491	207086.4	1179123
3	American Online	1648000	36213000	303000	406000	16326000
4	American Software Inc.	42949	105510	20121	9594	44584
5	Ansoft	10393	33491	10176	7768.4	16004.4
6	Applix	16755	40239	7502	10232	26789
7	Artisoft	13448	15689	3078	4005.6	9782
8	Aspentech	100254	268093	51567	36745.2	173295
9	Bindview	30056	86056	26500	17898.4	79884
10	BMC	1289700	1719200	294000	222680	1467900
11	Brio	24771	132036	19917	26483.2	111947
12	Ceridian Inc.	136095	1175700	62800	18256.4	616700
13	Cirrus	455395	564400	121410	143720	226092
14	Click2Learn	10893	42557	9535	20373	12647
15	Computer Asciates Inc.	2206000	6103000	1363000	755600	4641600
16	Corel	57584	157487	43867	47568	110462
17	Datawatch	2324	22473	1837	7214.4	18914
18	Digital Insight	46539	54428	22139	12581.6	21147
19	Dacocorp	13793	52331	10224	3310	31266
20	eGames	2481	13640	860	2708.8	8338
21	Evan & Sutherland	216078	166980	44264	13762.4	29448
22	Graphon	2738	7566	4653	2300	3264
23	Immersion	5438	15263	7250	4396	10767
24	Informax	10385	17147	5311	7505.6	14713
25	Info Space	299822	214530	40624	52432.4	178903
26	Intellic Corp	2946	22666	4761	5570.8	11866
27	Interactif Intelegence	8690	38596	10835	9057.6	27938
28	Interplay Entertainment Corp.	58137	104582	22176	14692.4	50321
29	Interwoven Inc	85473	132129	17700	58153.2	92488
30	Intrado Inc	19414	43124	4174	6884.8	30256
31	J D A Software Group Inc	38120	171729	29040	19812.4	96162
32	Kronos Incorperated	65320	269607	29889	44010	165958
33	Logility Inc	18033	32289	4949	6380.8	22152
34	Macromedia Inc.	41704	264159	77255	55046	235330
35	Manhatan Ascosiated Inc	39010	133096	16106	13269.6	76736
36	Mapics Inc	29697	140362	16375	27003.6	109186
37	Mapinfo Corperation	30648	96160	14514	19803.2	75207
38	Mediaware Information Systems	9000	26706	5135	17251	20849
39	Mentor Graphic Corp.	173627	589835	125952	101094	471147
40	**Microsoft**	13872000	22956000	3772000	2070400	19954000
41	Modlflow Corporation	3194	27369	4074	7405.2	25527

42	MRO Software Inc	50388	168661	21288	32800.4	110271
43	Neomedia Technology Inc.	3564	27565	1101	5405.6	9032
44	Net Guru Inc	7357	19936	2452	11221	12120
45	Network	514974	745692	173468	593128	680911
46	Nuance Communication	27730	51818	20160	41066	31401
47	Onyx Software Corporation	31503	119309	21046	28120.8	93521
48	Optimal Robotics Corp	29348	60971	913	4250.4	30412
49	Optio Software Inc.	5258	32833	3559	6284.4	23856
50	Pumatech	14715	30813	22127	9017.6	27033
51	Q A D Inc	39835	239262	34084	41322.4	153144
52	Quadramed Corporation	30951	120111	21872	27628.8	81755
53	Radview Software Ltd.	1296	10790	5223	5866.8	9740
54	Rainbow Technology Inc	45786	163284	11485	18632	92446
55	Rational Sofware Corporation	245310	572190	106375	108309.2	322822.2
56	Realnetwork Inc.	120441	241538	57819	51601.6	93393.6
57	Roguewave Software Inc.	18252	54442	14072	12063.6	44751
58	Sapient Corp.	154221	503339	249279	33027.2	451633.2
59	Serena Software Inc.	10190	75407	6848	11309.6	60985
60	Smartdisk Corp	31619	96722	9174	7544.8	50287
61	SPSS Inc	33654	186114	32896	51647.6	169846
62	SS & C Technology Inc.	47352	60014	14239	9980.4	36986
63	Serviceware Technoly Inc.	18967	17136	4404	8164.8	7558
64	Stelent Inc.	1923	22360	2878	6154.4	18252
65	Synopsys Inc.	564529	783778	189280	139204	659304
66	Tarantella Inc.	51826	148923	39673	43201.6	107127
67	T D K Mediactive Inc.	2748	2623	549	935.6	2214
68	Teknowledge Corp.	3029	14376	558	1405.6	4587
69	T C S I Corporation	27749	18901	9317	5508.4	12565
70	Timberline Software Corp.	25178	51176	13254	6568.4	46105
71	Timeline Inc	2230	7946	1161	1192.4	6789
72	Unisys Corp.	1249700	6885000	333600	531480	2089100
73	Voxware Inc.	2652	3801	2835	2004	2932
74	Yahoo! Inc.	789421	1110178	117268	197700.8	960434

**Operating Income before R&D and advertising expense*

Software Company Financial Data
Fiscal Year 2001

No.	Company Name	Tangible Asset	Revenue	R&D Expense	Adv. Expense	Operating Income*
	(In Thousands)					
1	Acclaim Entertainment Inc.	36688	197568	39860	28988	135545
2	Adobe System Inc.	443944	1229720	224122	207738	1148269
3	American Online	6678000	38234000	378750	3838400	17530000
4	American Software Inc.	27886	88707	15573	9035	33512
5	Ansoft	17509	43558	11044	9232	21947
6	Applix	16410	40303	6848	8668	35412
7	Artisoft	4005	7464	3691	3554	4211
8	Aspentech	74281	310624	68913	200473	239811
9	Bindview	17244	70888	22668	19632	62422
10	BMC	1032100	1504000	256100	240280	1200600
11	Brio	34121	149974	26291	34581	118794
12	ceridian Inc.	181400	1182300	24131	161840	608700
13	Cirrus	148082	778673	127599	43852	292318
14	Click2Learn	8373	45091	8869	7416	40091
15	Computer Asciates Inc.	2209000	4198000	695000	1026000	2509000
16	Corel	98418	134320	25251	33568	108393
17	Datawatch	1660	18403	2002	7022	15003
18	Digital Insight	89418	94653	23420	12312	39258
19	Dacocorp	10775	63203	10828	3738	36797
20	eGames	3725	7172	748	2364	5426
21	Evan & Sutherland	62543	145263	28844	12024	29440
22	Graphon	1436	5911	4560	2396	3298
23	Immersion	7428	19232	7548	3947	13158
24	Informax	9205	25184	9622	11610	21485
25	Info Space	250415	161921	39341	47333	120080
26	Intellic Corp	2075	25613	2897	5718	13197
27	Interactif Intelegence	17179	50104	15616	11581	35748
28	Interplay Entertainment Corp.	15379	57789	20603	13064	31973
29	Interwoven Inc	64690	202721	4199	7521	141822
30	Intrado Inc	24407	78187	6423	11315	49464
31	J D A Software Group Inc	34090	206912	36767	26039	123424
32	Kronos Incorperated	68228	292947	33333	47226	182268
33	Logility Inc	15246	28206	5211	7029	16349
34	Macromedia Inc.	65478	389600	130444	77781	347202
35	Manhatan Ascosiated Inc	46178	151269	19413	16462	93787
36	Mapics Inc	70883	137716	17277	21853	119994
37	Mapinfo Corperation	39157	110034	19144	23730	82971
38	Mediaware Information Systems	9812	26159	5109	17482	21534
39	Mentor Graphic Corp.	205441	600371	137799	101282	485698
40	Microsoft	20855000	25296000	4379000	2296800	21841000
41	Modlflow Corporation	17294	39943	6642	10196	36657

42	MRO Software Inc	82098	185450	27559	36490	112589
43	Neomedia Technology Inc.	8547	30854	549	2916	12543
44	Net Guru Inc	12186	31302	2706	5528	14844
45	Network	494113	834478	146701	218083	676400
46	Nuance Communication	18442	39225	18779	20945	16192
47	Onyx Software Corporation	28328	97161	21968	27151	61281
48	Optimal Robotics Corp	91119	101421	1223	7412	72456
49	Optio Software Inc.	5376	36830	5495	9664	21704
50	Pumatech	35831	38693	23723	11316	28457
51	Q A D Inc	42145	214075	34492	35586	124119
52	Quadramed Corporation	33124	129435	15843	25219	97705
53	Radview Software Ltd.	2503	8646	6046	6738	7206
54	Rainbow Technology Inc	72589	137261	10209	18498	65289
55	Rational Sofware Corporation	545521	814935	199331	151478	692891
56	Realnetwork Inc.	167189	188905	55904	37473	68686
57	Roguewave Software Inc.	17733	57653	13759	12419	45084
58	Sapient Corp.	239663	329698	235766	63679	298654
59	Serena Software Inc.	58250	103609	10101	14266	89461
60	Smartdisk Corp	30562	40319	5869	3147	16442
61	SPSS Inc	47999	176556	32305	50243	156721
62	SS & C Technology Inc.	44861	55717	11291	8557	36118
63	Serviceware Technoly Inc.	2816	11933	6345	6884	1994
64	Stelent Inc.	107552	66721	9756	9369	55362
65	Synopsys Inc.	458741	680350	189831	137454	550228
66	Tarantella Inc.	25577	66662	18439	25706	49347
67	T D K Mediactive Inc.	10251	37621	1066	3932	4695
68	Teknowledge Corp.	4429	4956	490	1495	3542
69	T C S I Corporation	16418	11060	7307	7222	6745
70	Timberline Software Corp.	30354	57308	16332	7710	51705
71	Timeline Inc	6876	4950	1605	1584	5051
72	Unisys Corp.	1347500	6018100	331500	462520	1484100
73	Voxware Inc.	2457	4501	2058	1834	2915
74	Yahoo! Inc.	1399115	717422	126090	186518	560421

**Operating Income before R&D and advertising expense*

Software Company 4 year R&D Expenditure and Sales

No.	Company Name	1994		1995		1996		1997	
		Sales	R&D	Sales	R&D	Sales	R&D	Sales	R&D
	(In Thousands)								
1	**Acclaim Entertainment Inc.**	480756	4628	566723	10126	161945	34582	**165411**	**41689**
2	**Adobe System Inc.**	553594	129266	632038	153599	786563	176669	911894	176558
3	American Online	115722	5288	394290	64598	1093854	70798	1685000	79000
4	American Software Inc.	94222	41750	79462	61558	77557	25443	84711	7343
5	Ansoft	5121	1296	6154	1462	8695	1766	14188	2993
6	Applix	18495	2606	32343	10379	51237	17552	48498	8661
7	Artisoft	107430	5888	84243	7655	60972	33836	33409	9300
8	Aspentech	44975	8159	57498	11375	103609	44629	194070	33580
9	Bindview	5171	820	7333	1249	11002	2088	20838	3573
10	BMC	288500	79007	345000	84753	428850	82600	791939	113795
11	Brio	3467	725	3512	934	4527	1555	13386	2447
12	ceridian Inc.	1177800	40500	1333000	54500	1495600	59600	1053500	59200
13	Cirrus	557299	126632	889022	165622	1146945	238791	917154	230786
14	Click2Learn	14825	16788	19706	13610	14881	12375	25705	8423
15	Computer Asciates Inc.	2148470	211273	2622992	482085	3504629	1588684	4040000	377000
16	Corel	164313	23224	196379	45268	334245	65927	260581	89499
17	Datawatch	16882	2125	23360	2210	30022	2338	32047	2804
18	Digital Insight	346	315	176	108	1561	94	3972	1612
19	Dacocorp	3546	1264	10814	3952	11470	4406	17503	4956
20	eGames	1476	2192	2740	625	1985	728	4382	415
21	Evan & Sutherland	113090	27890	113194	19406	130564	21753	159353	25492
22	Graphon	451	223	588	59	595	42	1463	191
23	Immersion	1254	186	1353	252	2737	586	4332	586
24	Informax	181	736	865	137	1018	161	2202	365
25	Info Space	513	1201	376	104	2199	149	1685	213
26	Intellic Corp	12047	2766	17357	4210	10992	3539	12686	3771
27	Interactif Intelegence	113	96	123	297	0	987	5590	2118
28	Interplay Entertainment Corp.	52668	3646	79546	8200	96952	15120	85961	14291
29	Interwoven Inc	70	112	447	136	0	158	3168	884
30	Intrado Inc	2000	1137	7413	2840	14802	2996	27072	738
31	J D A Software Group Inc	23829	1923	30084	3512	47840	6478	91771	11364
32	Kronos Incorperated	92919	6235	120373	8192	142957	12730	170538	16538
33	Logility Inc	10239	1389	10210	1168	16633	1452	21824	3484
34	Macromedia Inc.	37542	10106	55892	12360	116691	20033	107365	30013
35	Manhatan Ascosiated Inc	6512	328	11221	1138	14400	1236	32457	3025

36	Mapics Inc	272430	465612	15732	4799	77602	6398	95404	10259
37	Mapinfo Corperation	29720	4102	40041	5752	41532	6984	47393	9020
38	Mediaware Information Systems Inc	4900	6463	8079	1387	10432	5329	18903	2115
39	Mentor Graphic Corp.	346204	67792	432517	86782	447886	92905	454727	112227
40	**Microsoft**	4649000	610000	5937000	860000	8671000	1432000	11358000	1925000
41	Modlflow Corporation	12444	11202	-947	3182	14003	3535	14823	3527
42	MRO Software Inc	36753	4753	50372	6639	73329	7653	26572	11387
43	Neomedia Technology Inc.	3842	3842	12801	436	17518	335	24434	752
44	Net Guru Inc	6591	5492	749	977	7323	1149	11023	1898
45	Network	52937	6857	90065	9354	181126	22191	735692	103051
46	Nuance Communication	1551	3242	-2593	3704	4631	1469	4382	2622
47	Onyx Software Corporation	768	1758	2198	255	9645	1170	19437	4729
48	Optimal Robotics Corp	1200	2171	-907	430	2894	506	3397	294
49	Optio Software Inc.	3053	4906	20	862	6790	790	9002	891
50	Pumatech	70	1564	2860	1543	7716	2683	15629	6236
51	Q A D Inc	36394	69860	1734	16214	35257	59188	126444	25434
52	Quadramed Corporation	6102	767	7603	2893	74269	5028	99625	32878
53	Radview Software Ltd.	342	1163	-1995	985	1662	1559	5254	1481
54	Rainbow Technology Inc	55083	4584	72584	6073	81710	6247	94724	8424
55	Rational Sofware Corporation	70343	20221	77349	13914	103952	18305	145373	24445
56	Realnetwork Inc.	0	202	1812	1380	14012	4812	32720	13268
57	Roguewave Software Inc.	7209	2109	11937	3204	19884	5766	33409	7619
58	Sapient Corp.	9373	4310	24481	11723	49009	22985	90360	43816
59	Serena Software Inc.	3614	6917	8138	1837	10744	2998	17454	4321
60	Smartdisk Corp	350	253	316	125	500	198	5412	1412
61	SPSS Inc	74670	10860	87403	12985	99621	15972	134861	21132
62	SS & C Technology Inc.	12768	3388	23311	15609	31534	8414	42192	10245
63	Serviceware Technoly Inc.	2789	3778	846	1704	5037	2005	2473	809
64	Stelent Inc.	5628	9298	10447	342	14235	496	2010	1115
65	Synopsys Inc.	199200	47201	265500	58673	525599	184534	646956	152113
66	Tarantella Inc.	184068	28046	199329	32208	207890	39009	193660	46130
67	T D K Mediactive Inc.	2271	1831	2154	378	2265	718	4597	1596
68	Teknowledge Corp.	2902	4731	5566	1458	7158	1124	11094	207
69	T C S I Corporation	40306	526	55362	1256	60233	11229	39578	5932
70	Timberline Software Corp.	21640	4027	24819	5060	28659	5647	35240	7264
71	Timeline Inc	3231	3186	3540	649	5047	1982	5503	1415
72	Unisys Corp.	6095500	458500	6342300	404500	6370500	342900	6636000	302300
73	Voxware Inc.		93			4494	2497	7428	3796
74	Yahoo! Inc.	6366	1377	1620	560	16768	5700	59565	12082
	Total								

Software Company Scale
Fiscal Year 1997

No.	Company Names	OI/S	TA/S	ADV/S	RD/S			
					RD/S0	RD/S1	RD/S2	RD/S3
1	**Acclaim Entertainment Inc.**	**0.575**	0.281	0.305	0.252	0.214	0.018	0.010
2	**Adobe System Inc.**	**0.613**	0.457	0.166	0.194	0.225	0.243	0.234
3	American Online	**0.162**	0.425	0.053	0.047	0.065	0.164	0.046
4	American Software Inc.	**0.205**	0.590	0.098	0.087	0.328	0.775	0.443
5	Ansoft	**0.615**	0.732	0.224	0.211	0.203	0.238	0.253
6	Applix	**0.459**	0.301	0.229	0.179	0.343	0.321	0.141
7	Artisoft	**0.714**	0.221	0.280	0.278	0.555	0.091	0.055
8	Aspentech	**0.387**	0.344	0.115	0.173	0.431	0.198	0.181
9	Bindview	**0.625**	0.640	0.174	0.171	0.190	0.170	0.159
10	BMC	**0.582**	0.496	0.132	0.144	0.193	0.246	0.274
11	Brio	**0.962**	0.484	0.406	0.183	0.343	0.266	0.209
12	ceridian	**0.176**	0.373	0.077	0.056	0.040	0.041	0.034
13	Cirrus	**0.318**	0.308	0.055	0.252	0.208	0.186	0.227
14	Click2Learn	**0.652**	0.421	0.229	0.328	0.832	0.691	0.458
15	Computer Asciates Inc.	**0.574**	0.257	0.145	0.093	0.453	0.184	0.098
16	Corel	**0.885**	0.211	0.252	0.343	0.197	0.231	0.141
17	Datawatch	**0.633**	0.075	0.190	0.087	0.078	0.095	0.126
18	Digital Insight	**0.757**	0.509	0.253	0.406	0.060	0.614	0.909
19	Dacocorp	**0.395**	0.687	0.051	0.283	0.384	0.365	0.356
20	eGames	**0.836**	0.207	0.365	0.095	0.367	0.228	0.228
21	Evan & Sutherland	**0.464**	0.259	0.089	0.160	0.167	0.171	0.247
22	Graphon	**0.596**	0.248	0.315	0.131	0.071	0.100	0.494
23	Immersion	**0.575**	0.428	0.307	0.135	0.214	0.186	0.148
24	Informax	**0.461**	0.670	0.195	0.166	0.158	0.158	0.158
25	Info Space	**0.591**	0.765	0.197	0.126	0.068	0.068	0.068
26	Intellic Corp	**0.725**	0.406	0.210	0.297	0.322	0.243	0.230
27	Interactif Intelegence	**0.782**	0.375	0.233	0.379	0.000	0.000	0.000
28	Interplay Entertainment Corp.	**0.319**	0.120	0.138	0.166	0.156	0.103	0.069
29	Interwoven Inc	**0.680**	0.457	0.271	0.279	0.000	0.000	0.000
30	Intrado Inc	**0.309**	0.701	0.105	0.027	0.202	0.383	0.569
31	J D A Software Group Inc	**0.433**	0.561	0.095	0.124	0.135	0.117	0.081
32	Kronos Incorperated	**0.367**	0.190	0.163	0.097	0.089	0.068	0.067
33	Logility Inc	**0.492**	0.793	0.241	0.160	0.087	0.114	0.136
34	Macromedia Inc.	**0.680**	0.429	0.252	0.280	0.172	0.221	0.269
35	Manhatan Ascosiated Inc	**0.429**	0.329	0.081	0.093	0.086	0.101	0.050
36	Mapics Inc	**0.520**	0.181	0.168	0.108	0.082	0.082	0.082
37	Mapinfo Corperation	**0.659**	0.263	0.252	0.190	0.168	0.144	0.138
38	Mediaware Information Systems Inc	**0.408**	0.246	0.182	0.112	0.511	0.172	0.172

39	Mentor Graphic Corp.	**0.482**	0.301	0.177	0.247	0.207	0.201	0.196
40	**Microsoft**	**0.712**	0.336	0.113	0.169	0.165	0.145	0.131
41	Modlflow Corporation	**0.615**	0.282	0.282	0.238	0.252	0.252	0.252
42	MRO Software Inc	**0.726**	0.766	0.250	0.429	0.104	0.132	0.129
43	Neomedia Technology Inc.	**0.263**	0.071	0.148	0.031	0.019	0.034	0.034
44	Net Guru Inc	**0.500**	0.446	0.285	0.172	0.157	0.157	0.157
45	Network	**0.299**	0.305	0.057	0.140	0.123	0.104	0.130
46	Nuance Communication	**1.021**	0.801	0.295	0.598	0.317	1.000	0.317
47	Onyx Software Corporation	**0.604**	0.795	0.271	0.243	0.121	0.116	0.116
48	Optimal Robotics Corp	**0.476**	0.822	0.278	0.087	0.175	0.175	0.175
49	Optio Software Inc.	**0.406**	0.626	0.214	0.099	0.116	0.149	0.149
50	Pumatech	**0.598**	0.847	0.156	0.399	0.348	0.540	0.000
51	Q A D Inc	**0.441**	0.137	0.219	0.201	0.201	0.201	0.201
52	Quadramed Corporation	**0.521**	0.215	0.146	0.330	0.068	0.381	0.126
53	Radview Software Ltd.	**0.558**	0.351	0.110	0.282	0.938	0.741	0.938
54	Rainbow Technology Inc	**0.385**	0.351	0.092	0.089	0.076	0.084	0.083
55	Rational Sofware Corporation	**0.467**	0.093	0.186	0.168	0.176	0.180	0.287
56	Realnetwork Inc.	**0.765**	0.433	0.320	0.406	0.343	0.762	0.000
57	Roguewave Software Inc.	**0.530**	0.769	0.215	0.228	0.290	0.268	0.293
58	Sapient Corp.	**0.808**	0.222	0.124	0.485	0.469	0.479	0.460
59	Serena Software Inc.	**0.464**	0.505	0.158	0.248	0.279	0.226	0.226
60	Smartdisk Corp	**0.648**	0.509	0.236	0.261	0.396	0.396	0.396
61	SPSS Inc	**0.437**	0.147	0.262	0.157	0.160	0.149	0.145
62	SS & C Technology Inc.	**0.446**	0.724	0.188	0.243	0.267	0.670	0.265
63	Serviceware Technoly Inc.	**0.689**	0.564	0.550	0.327	0.398	0.398	0.398
64	Stelent Inc.	**0.183**	0.582	1.339	0.555	0.035	0.033	0.054
65	Synopsys Inc.	**0.590**	0.524	0.178	0.235	0.351	0.221	0.237
66	Tarantella Inc.	**0.479**	0.200	0.207	0.238	0.188	0.162	0.152
67	T D K Mediactive Inc.	**0.283**	0.401	0.299	0.347	0.317	0.175	0.175
68	Teknowledge Corp.	**0.173**	0.197	0.096	0.019	0.157	0.262	0.262
69	T C S I Corporation	**0.159**	0.479	0.188	0.150	0.186	0.023	0.013
70	Timberline Software Corp.	**0.517**	0.332	0.126	0.206	0.197	0.204	0.186
71	Timeline Inc	**0.095**	0.298	0.327	0.257	0.393	0.183	0.183
72	Unisys Corp.	**0.105**	0.176	0.086	0.046	0.054	0.064	0.075
73	Voxware Inc.	**0.418**	0.394	0.389	0.511	0.556	0.000	0.000
74	Yahoo! Inc.	**0.043**	0.676	0.357	0.203	0.340	0.346	0.346

Software Company Scale
Fiscal Year 1998

	Company Names	OI/S	TA/S	ADV/S	RD/S			
					RD/S0	RD/S1	RD/S2	RD/S3
1	Acclaim Entertainment Inc.	0.545	0.166	0.142	0.114	0.252	0.214	0.018
2	Adobe System Inc.	0.875	0.542	0.185	0.232	0.194	0.225	0.243
3	American Online	0.414	0.268	0.081	0.108	0.047	0.065	0.164
4	American Software Inc.	0.560	0.542	0.096	0.113	0.087	0.328	0.775
5	Ansoft	0.774	0.460	0.192	0.278	0.211	0.203	0.238
6	Apr[illegible]x	0.797	0.338	0.205	0.174	0.179	0.343	0.321
7	Artisoft	0.737	0.252	0.162	0.284	0.278	0.555	0.091
8	Aspentech	0.704	0.308	0.119	0.172	0.173	0.431	0.198
9	Bindview	0.945	0.390	0.255	0.294	0.171	0.190	0.170
10	BMC	0.893	0.464	0.129	0.127	0.144	0.193	0.246
11	Brio	0.865	0.282	0.340	0.195	0.183	0.343	0.266
12	Ceridian	0.752	0.401	0.108	0.067	0.056	0.040	0.041
13	Cirrus	0.470	0.344	0.049	0.188	0.252	0.208	0.186
14	Click2Learn	0.568	0.378	0.170	0.183	0.328	0.832	0.691
15	Computer Asciates Inc.	0.734	0.287	0.167	0.088	0.093	0.453	0.184
16	Corel	0.791	0.259	0.194	0.291	0.343	0.197	0.231
17	Datawatch	0.794	0.111	0.388	0.134	0.087	0.078	0.095
18	Digital Insight	0.648	0.286	0.463	0.343	0.406	0.060	0.614
19	Dacocorp	0.579	0.309	0.053	0.184	0.283	0.384	0.365
20	eGames	0.629	0.114	0.172	0.043	0.095	0.367	0.228
21	Evan & Sutherland	0.425	0.251	0.084	0.166	0.160	0.167	0.171
22	Graphon	0.689	0.199	0.271	0.410	0.131	0.071	0.100
23	Immersion	0.763	0.320	0.225	0.321	0.135	0.214	0.186
24	Informax	0.692	0.699	0.240	0.282	0.166	0.158	0.158
25	Info Space	0.777	0.432	0.164	0.155	0.126	0.068	0.068
26	Intellic Corp	0.729	0.246	0.163	0.238	0.297	0.322	0.243
27	Interactif Intelegence	0.618	0.271	0.294	0.451	0.379	0.000	0.000
28	Interplay Entertainment Corp.	0.433	0.094	0.202	0.193	0.166	0.156	0.103
29	Interwoven Inc	0.689	0.421	0.305	0.394	0.279	0.000	0.000
30	Intrado Inc	0.671	0.642	0.105	0.040	0.027	0.202	0.383
31	J D A Software Group Inc	0.515	0.433	0.108	0.283	0.124	0.135	0.117
32	Kronos Incorperated	0.623	0.187	0.162	0.097	0.097	0.089	0.068
33	Logility Inc	0.695	0.581	0.194	0.161	0.160	0.087	0.114
34	Macromedia Inc.	0.862	0.471	0.259	0.391	0.280	0.172	0.221
35	Manhatan Ascosiated Inc	0.871	0.200	0.102	0.146	0.093	0.086	0.101
36	Mapics Inc	0.784	0.155	0.198	0.116	0.108	0.082	0.082
37	Mapinfo Corperation	0.776	0.192	0.222	0.169	0.190	0.168	0.144
38	Mediaware Information Systems Inc	0.711	0.264	0.167	0.123	0.112	0.511	0.172

39	Mentor Graphic Corp.	0.748	0.325	0.200	0.240	0.247	0.207	0.201
40	**Microsoft**	0.839	0.683	0.085	0.190	0.169	0.165	0.145
41	Modlflow Corporation	0.826	0.263	0.229	0.165	0.238	0.252	0.252
42	MRO Software Inc	0.452	0.392	0.157	0.187	0.429	0.104	0.132
43	Neomedia Technology Inc.	0.506	0.086	0.253	0.046	0.031	0.019	0.034
44	Net Guru Inc	0.712	0.329	0.212	0.147	0.172	0.157	0.157
45	Network	0.503	0.264	0.153	0.137	0.140	0.123	0.104
46	Nuance Communication	0.695	0.702	0.308	0.531	0.598	0.317	1.000
47	Onyx Software Corporation	0.740	0.512	0.267	0.250	0.243	0.121	0.116
48	Optimal Robotics Corp	0.264	0.579	0.330	0.037	0.087	0.175	0.175
49	Optio Software Inc.	0.757	0.484	0.230	0.114	0.099	0.116	0.149
50	Pumatech	0.862	0.691	0.177	0.443	0.399	0.348	0.540
51	Q A D Inc	0.757	0.118	0.200	0.172	0.201	0.201	0.201
52	Quadramed Corporation	0.479	0.156	0.102	0.191	0.330	0.068	0.381
53	Radview Software Ltd.	0.912	0.432	0.154	0.284	0.282	0.938	0.741
54	Rainbow Technology Inc	0.492	0.354	0.097	0.107	0.089	0.076	0.084
55	Rational Sofware Corporation	0.797	0.051	0.216	0.198	0.168	0.176	0.180
56	Realnetwork Inc.	0.809	0.793	0.261	0.321	0.406	0.343	0.762
57	Roguewave Software Inc.	0.836	0.673	0.211	0.214	0.228	0.290	0.268
58	Sapient Corp.	0.973	0.142	0.068	0.253	0.485	0.469	0.479
59	Serena Software Inc.	0.788	0.319	0.140	0.172	0.248	0.279	0.226
60	Smartdisk Corp	0.178	0.666	0.162	0.138	0.261	0.396	0.396
61	SPSS Inc	0.700	0.145	0.246	0.159	0.157	0.160	0.149
62	SS & C Technology Inc.	0.698	0.512	0.135	0.251	0.243	0.267	0.670
63	Serviceware Technoly Inc.	0.889	0.306	0.309	0.410	0.327	0.398	0.398
64	Stelent Inc.	0.685	0.376	0.137	0.099	0.555	0.035	0.033
65	Synopsys Inc.	0.869	0.549	0.163	0.261	0.235	0.351	0.221
66	Tarantella Inc.	0.726	0.263	0.229	0.241	0.238	0.188	0.162
67	T D K Mediactive Inc.	0.312	0.242	0.190	0.178	0.347	0.317	0.175
68	Teknowledge Corp.	0.488	0.209	0.106	0.011	0.019	0.157	0.262
69	T C S I Corporation	0.903	0.521	0.153	0.291	0.150	0.186	0.023
70	Timberline Software Corp.	0.649	0.308	0.111	0.200	0.206	0.197	0.204
71	Timeline Inc	0.699	0.565	0.237	0.229	0.257	0.393	0.183
72	Unisys Corp.	0.756	0.188	0.075	0.041	0.046	0.054	0.064
73	Voxware Inc.	0.901	0.579	0.259	0.463	0.511	0.556	0.000
74	Yahoo! Inc.	0.538	0.464	0.235	0.129	0.203	0.340	0.346

Software Company Scale
Fiscal Year 1999

	Company Names	OI/S	TA/S	ADV/S	RD/S			
					RD/S0	RD/S1	RD/S2	RD/S3
1	Acclaim Entertainment Inc.	0.534	0.161	0.127	0.117	0.114	0.252	0.214
2	Adobe System Inc.	0.907	0.756	0.170	0.198	0.232	0.194	0.225
3	American Online	0.444	0.239	0.068	0.061	0.108	0.047	0.065
4	American Software Inc.	0.414	0.402	0.106	0.205	0.113	0.087	0.328
5	Ansoft	0.746	0.824	0.279	0.343	0.278	0.211	0.203
6	Applix	0.872	0.808	0.217	0.193	0.174	0.179	0.343
7	Artisoft	0.818	0.339	0.693	0.241	0.284	0.278	0.555
8	Aspentech	0.595	0.443	0.151	0.215	0.172	0.173	0.431
9	Bindview	0.946	0.258	0.195	0.269	0.294	0.171	0.190
10	BMC	0.883	0.614	0.128	0.139	0.127	0.144	0.193
11	Brio	0.851	0.395	0.279	0.154	0.195	0.183	0.343
12	Ceridian	0.525	0.130	0.113	0.056	0.067	0.056	0.040
13	Cirrus	0.045	0.373	0.065	0.238	0.188	0.252	0.208
14	Click2Learn	0.438	0.382	0.537	0.214	0.183	0.328	0.832
15	Computer Asciates Inc.	0.738	0.408	0.175	0.091	0.088	0.093	0.453
16	Corel	0.755	0.272	0.214	0.165	0.291	0.343	0.197
17	Datawatch	0.774	0.125	0.328	0.088	0.134	0.087	0.078
18	Digital Insight	0.402	0.891	0.339	0.296	0.343	0.406	0.060
19	Dacocorp	0.596	0.202	0.065	0.183	0.184	0.283	0.384
20	eGames	0.641	0.153	0.192	0.093	0.043	0.095	0.367
21	Evan & Sutherland	0.365	0.262	0.086	0.221	0.166	0.160	0.167
22	Graphon	0.490	0.258	0.157	0.239	0.410	0.131	0.071
23	Immersion	0.729	0.551	0.130	0.504	0.321	0.135	0.214
24	Informax	0.799	0.165	0.280	0.259	0.282	0.166	0.158
25	Info Space	0.813	2.800	0.432	0.216	0.155	0.126	0.068
26	Intellic Corp	0.530	0.166	0.214	0.270	0.238	0.297	0.322
27	Interactif Intelegence	0.690	0.496	0.271	0.365	0.451	0.379	0.000
28	Interplay Entertainment Corp.	0.401	0.101	0.199	0.178	0.193	0.166	0.156
29	Interwoven Inc	0.619	4.943	0.448	0.250	0.394	0.279	0.000
30	Intrado Inc	0.864	0.757	0.126	0.053	0.040	0.027	0.202
31	J D A Software Group Inc	0.491	0.381	0.117	0.175	0.283	0.124	0.135
32	Kronos Incorperated	0.643	0.261	0.159	0.105	0.097	0.097	0.089
33	Logility Inc	0.626	0.515	0.278	0.228	0.161	0.160	0.087
34	Macromedia Inc.	0.905	0.772	0.207	0.238	0.391	0.280	0.172
35	Manhatan Ascosiated Inc	0.741	0.362	0.134	0.125	0.146	0.093	0.086
36	Mapics Inc	0.486	0.189	0.206	0.134	0.116	0.108	0.082
37	Mapinfo Corperation	0.790	0.282	0.224	0.151	0.169	0.190	0.168
38	Mediaware Information Systems	0.703	0.120	0.177	0.275	0.123	0.112	0.511

39	Mentor Graphic Corp.	0.769	0.295	0.172	0.229	0.240	0.247	0.207
40	Microsoft	0.857	0.781	0.079	0.150	0.190	0.169	0.165
41	Modlflow Corporation	0.916	0.186	0.267	0.171	0.165	0.238	0.252
42	MRO Software Inc	0.675	0.335	0.161	0.103	0.187	0.429	0.104
43	Neomedia Technology Inc.	0.497	0.233	0.191	0.039	0.046	0.031	0.019
44	Net Guru Inc	0.893	0.541	0.284	0.225	0.147	0.172	0.157
45	Network	0.815	0.540	0.266	0.223	0.137	0.140	0.123
46	Nuance Communication	0.345	0.798	0.721	0.603	0.531	0.598	0.317
47	Onyx Software Corporation	0.765	0.081	0.233	0.172	0.250	0.243	0.121
48	Optimal Robotics Corp	0.208	0.198	0.083	0.007	0.037	0.087	0.175
49	Optio Software Inc.	0.744	0.525	0.213	0.129	0.114	0.099	0.116
50	Pumatech	0.935	0.856	0.218	0.554	0.443	0.399	0.348
51	Q A D Inc	0.695	0.133	0.241	0.250	0.172	0.201	0.201
52	Quadramed Corporation	0.664	0.184	0.157	0.149	0.191	0.330	0.068
53	Radview Software Ltd.	0.920	0.481	0.551	0.334	0.284	0.282	0.938
54	Rainbow Technology Inc	0.681	0.328	0.109	0.090	0.107	0.089	0.076
55	Rational Sofware Corporation	0.550	0.302	0.200	0.175	0.198	0.168	0.176
56	Realnetwork Inc.	0.751	0.852	0.213	0.293	0.321	0.406	0.343
57	Roguewave Software Inc.	0.822	0.492	0.217	0.217	0.214	0.228	0.290
58	Sapient Corp.	0.607	0.288	0.131	0.306	0.253	0.485	0.469
59	Serena Software Inc.	0.788	0.109	0.147	0.092	0.172	0.248	0.279
60	Smartdisk Corp	0.384	0.077	0.032	0.146	0.138	0.261	0.396
61	SPSS Inc	0.909	0.147	0.249	0.168	0.159	0.157	0.160
62	SS & C Technology Inc.	0.578	0.768	0.195	0.284	0.251	0.243	0.267
63	Serviceware Technoly Inc.	0.746	0.170	0.329	0.388	0.410	0.327	0.398
64	Stelent Inc.	0.610	0.072	0.219	0.130	0.099	0.555	0.035
65	Synopsys Inc.	0.862	0.697	0.151	0.248	0.261	0.235	0.351
66	Tarantella Inc.	0.777	0.238	0.206	0.189	0.241	0.238	0.188
67	T D K Mediactive Inc.	0.550	0.717	0.346	0.293	0.178	0.347	0.317
68	Teknowledge Corp.	0.545	0.170	0.105	0.054	0.011	0.019	0.157
69	T C S I Corporation	0.913	0.676	0.102	0.193	0.291	0.150	0.186
70	Timberline Software Corp.	0.913	0.429	0.102	0.193	0.200	0.206	0.197
71	Timeline Inc	0.723	0.312	0.227	0.193	0.229	0.257	0.393
72	Unisys Corp.	0.356	0.163	0.073	0.045	0.041	0.046	0.054
73	Voxware Inc.	0.664	1.661	0.583	0.713	0.463	0.511	0.556
74	Yahoo! Inc.	0.843	0.699	0.180	0.122	0.129	0.203	0.340

Software Company Scale
Fiscal Year 2000

	Company Names	OI/S	TA/S	ADV/S	RD/S1			
					RD/S0	RD/S1	RD/S2	RD/S3
1	Acclaim Entertainment Inc.	0.441	0.248	0.271	0.304	0.117	0.114	0.252
2	Adobe System Inc.	0.931	0.401	0.164	0.019	0.198	0.232	0.194
3	American Online	0.451	0.046	0.011	0.008	0.061	0.108	0.047
4	American Software Inc.	0.423	0.407	0.091	0.191	0.205	0.113	0.087
5	Ansoft	0.478	0.310	0.232	0.304	0.343	0.278	0.211
6	Applix	0.666	0.416	0.254	0.186	0.193	0.174	0.179
7	Artisoft	0.623	0.857	0.255	0.196	0.241	0.284	0.278
8	Aspentech	0.646	0.374	0.137	0.192	0.215	0.172	0.173
9	Bindview	0.928	0.349	0.208	0.308	0.269	0.294	0.171
10	BMC	0.854	0.750	0.130	0.171	0.139	0.127	0.144
11	Brio	0.848	0.188	0.201	0.151	0.154	0.195	0.183
12	Ceridian	0.525	0.116	0.016	0.053	0.056	0.067	0.056
13	Cirrus	0.401	0.807	0.255	0.215	0.238	0.188	0.252
14	Click2Learn	0.297	0.256	0.479	0.224	0.214	0.183	0.328
15	Computer Asciates Inc.	0.761	0.361	0.124	0.223	0.091	0.088	0.093
16	Corel	0.701	0.366	0.302	0.279	0.165	0.291	0.343
17	Datawatch	0.842	0.103	0.321	0.082	0.088	0.134	0.087
18	Digital Insight	0.389	0.855	0.231	0.407	0.296	0.343	0.406
19	Dacocorp	0.597	0.264	0.063	0.195	0.183	0.184	0.283
20	eGames	0.611	0.182	0.199	0.063	0.093	0.043	0.095
21	Evan & Sutherland	0.176	1.294	0.082	0.265	0.221	0.166	0.160
22	Graphon	0.431	0.362	0.304	0.615	0.239	0.410	0.131
23	Immersion	0.705	0.356	0.288	0.475	0.504	0.321	0.135
24	Informax	0.858	0.606	0.438	0.310	0.259	0.282	0.166
25	Info Space	0.834	1.398	0.244	0.189	0.216	0.155	0.126
26	Intellic Corp	0.524	0.130	0.246	0.210	0.270	0.238	0.297
27	Interactif Intelegence	0.724	0.225	0.235	0.281	0.365	0.451	0.379
28	Interplay Entertainment Corp.	0.481	0.556	0.140	0.212	0.178	0.193	0.166
29	Interwoven Inc	0.700	0.647	0.440	0.134	0.250	0.394	0.279
30	Intrado Inc	0.702	0.450	0.160	0.097	0.053	0.040	0.027
31	J D A Software Group Inc	0.560	0.222	0.115	0.169	0.175	0.283	0.124
32	Kronos Incorperated	0.616	0.242	0.163	0.111	0.105	0.097	0.097
33	Logility Inc	0.686	0.558	0.198	0.153	0.228	0.161	0.160
34	Macromedia Inc.	0.891	0.158	0.208	0.292	0.238	0.391	0.280
35	Manhatan Ascosiated Inc	0.577	0.293	0.100	0.121	0.125	0.146	0.093
36	Mapics Inc	0.778	0.212	0.192	0.117	0.134	0.116	0.108
37	Mapinfo Corperation	0.782	0.319	0.206	0.151	0.151	0.169	0.190
38	Mediaware Information Systems	0.781	0.337	0.646	0.192	0.275	0.123	0.112

39	Mentor Graphic Corp.	0.799	0.294	0.171	0.214	0.229	0.240	0.247
40	**Microsoft**	0.869	0.604	0.090	0.164	0.150	0.190	0.169
41	Modlflow Corporation	0.933	0.117	0.271	0.149	0.171	0.165	0.238
42	MRO Software Inc	0.654	0.299	0.194	0.126	0.103	0.187	0.429
43	Neomedia Technology Inc.	0.328	0.129	0.196	0.040	0.039	0.046	0.031
44	Net Guru Inc	0.608	0.369	0.563	0.123	0.225	0.147	0.172
45	Network	0.913	0.691	0.795	0.233	0.223	0.137	0.140
46	Nuance Communication	0.606	0.535	0.793	0.389	0.603	0.531	0.598
47	Onyx Software Corporation	0.784	0.264	0.236	0.176	0.172	0.250	0.243
48	Optimal Robotics Corp	0.499	0.481	0.070	0.015	0.007	0.037	0.087
49	Optio Software Inc.	0.727	0.160	0.191	0.108	0.129	0.114	0.099
50	Pumatech	0.877	0.478	0.293	0.718	0.554	0.443	0.399
51	Q A D Inc	0.640	0.166	0.173	0.142	0.250	0.172	0.201
52	Quadramed Corporation	0.681	0.258	0.230	0.182	0.149	0.191	0.330
53	Radview Software Ltd.	0.903	0.120	0.544	0.484	0.334	0.284	0.282
54	Rainbow Technology Inc	0.566	0.280	0.114	0.070	0.090	0.107	0.089
55	Rational Sofware Corporation	0.564	0.429	0.189	0.186	0.175	0.198	0.168
56	Realnetwork Inc.	0.387	0.499	0.214	0.239	0.293	0.321	0.406
57	Roguewave Software Inc.	0.822	0.335	0.222	0.258	0.217	0.214	0.228
58	Sapient Corp.	0.897	0.306	0.066	0.495	0.306	0.253	0.485
59	Serena Software Inc.	0.809	0.135	0.150	0.091	0.092	0.172	0.248
60	Smartdisk Corp	0.520	0.327	0.078	0.095	0.146	0.138	0.261
61	SPSS Inc	0.913	0.181	0.278	0.177	0.168	0.159	0.157
62	SS & C Technology Inc.	0.616	0.789	0.166	0.237	0.284	0.251	0.243
63	Serviceware Technoly Inc.	0.441	1.107	0.476	0.257	0.388	0.410	0.327
64	Stelent Inc.	0.816	0.086	0.275	0.129	0.130	0.099	0.555
65	Synopsys Inc.	0.841	0.720	0.178	0.241	0.248	0.261	0.235
66	Tarantella Inc.	0.719	0.348	0.290	0.266	0.189	0.241	0.238
67	T D K Mediactive Inc.	0.844	1.048	0.357	0.209	0.293	0.178	0.347
68	Teknowledge Corp.	0.319	0.211	0.098	0.039	0.054	0.011	0.019
69	T C S I Corporation	0.665	1.468	0.291	0.493	0.193	0.291	0.150
70	Timberline Software Corp.	0.901	0.492	0.128	0.259	0.193	0.200	0.206
71	Timeline Inc	0.854	0.281	0.150	0.146	0.193	0.229	0.257
72	Unisys Corp.	0.303	0.182	0.077	0.048	0.045	0.041	0.046
73	Voxware Inc.	0.771	0.698	0.527	0.746	0.713	0.463	0.511
74	Yahoo! Inc.	0.865	0.711	0.178	0.106	0.122	0.129	0.203

Regression 1997

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	RD3, TA, ADV, RD1, RD2, RD0[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: OI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.586	.22685

a. Predictors: (Constant), RD3, TA, ADV, RD1, RD2, RD0

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.303	6	.384	192.000	.000[a]
	Residual	1.620	67	.002		
	Total	3.923	73			

a. Predictors: (Constant), RD3, TA, ADV, RD1, RD2, RD0

b. Dependent Variable: OI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.339	.071		4.762	.000
	TA	.163	.055	.140	2.964	.026
	ADV	.367	.099	.257	3.707	.005
	RD0	.354	.120	.298	2.784	.037
	RD1	.293	.081	.070	2.901	.031
	RD2	.235	.063	.014	3.730	.004
	RD3	.178	.071	.145	2.507	.033

a. Dependent Variable: OI

Regression 1998

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	RD3, ADV, TA, RD1, RD2, RD0[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: OI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.809[a]	.654	.654	.15457

a. Predictors: (Constant), RD3, ADV, TA, RD1, RD2, RD0

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.298	6	.216	21.600	.000[a]
	Residual	.687	67	.010		
	Total	1.985	73			

a. Predictors: (Constant), RD3, ADV, TA, RD1, RD2, RD0

b. Dependent Variable: OI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.560	.063		8.829	.000
	TA	.165	.033	.007	4.954	.000
	ADV	.571	.257	.028	2.222	.038
	RD0	.427	.239	.488	3.040	.003
	RD1	.376	.101	.209	3.723	.000
	RD2	.214	.053	.225	4.038	.000
	RD3	.198	.061	.120	3.246	.001

a. Dependent Variable: OI

egression 1999

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	RD3, TA, RD2, ADV, RD1, RD0[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: OI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.995[a]	.991	.989	.18778

a. Predictors: (Constant), RD3, TA, RD2, ADV, RD1, RD0

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	2.620	6	.044	112.821	.000[a]
	Residual	.024	65	.000		
	Total	2.644	71			

a. Predictors: (Constant), RD3, TA, RD2, ADV, RD1, RD0

b. Dependent Variable: OI

Coefficients[a]

lodel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.575	.056		10.322	.000
TA	.160	.065	.249	2.462	.007
ADV	.369	.165	.048	2.236	.005
RD0	.174	.037	.370	4.703	.000
RD1	.752	.204	.468	3.686	.000
RD2	.426	.124	.342	3.435	.002
RD3	.358	.157	.177	2.280	.016

a. Dependent Variable: OI

Regression 2000

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	RD3, TA, ADV, RD0, RD2, RD1[a]	.	Enter

a. All requested variables entered.

b. Dependent Variable: OI

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792[a]	.628	.628	.18947

a. Predictors: (Constant), RD3, TA, ADV, RD0, RD2, RD1

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	1.607	6	.268	19.143	.000[a]
	Residual	.952	67	.014		
	Total	2.559	73			

a. Predictors: (Constant), RD3, TA, ADV, RD0, RD2, RD1

b. Dependent Variable: OI

Coefficients[a]

odel	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.607	.056		10.800	.000
TA	.174	.077	.120	2.260	.027
ADV	.438	.170	.158	2.576	.004
RD0	.384	.155	.067	2.477	.006
RD1	.154	.032	.058	4.813	.000
RD2	.323	.081	.073	3.988	.000
RD3	.304	.140	.071	2.171	.001

Dependent Variable: OI