Financial Statement Analysis Project

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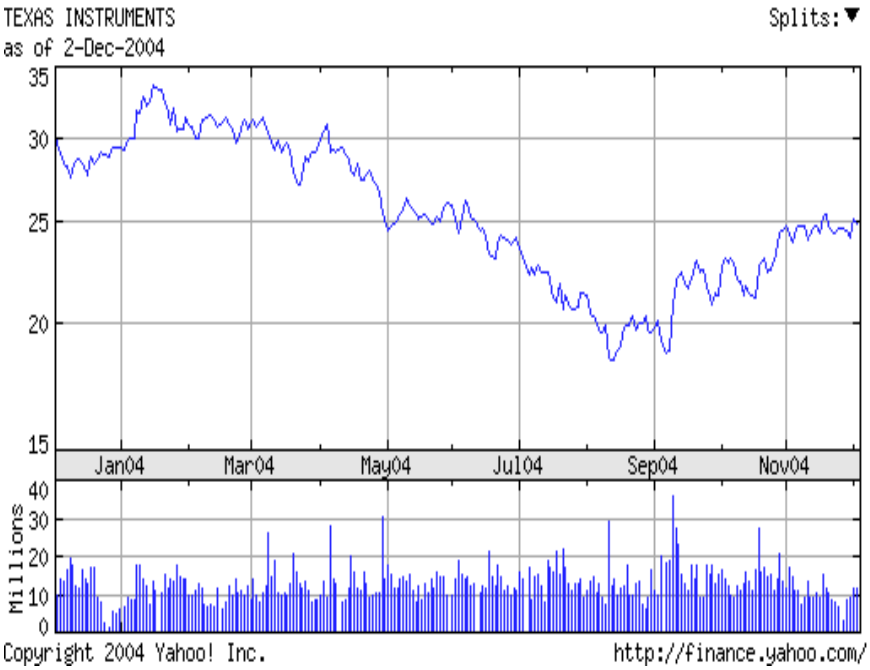
Analysis of Texas Instruments Corporation

Investment Recommendation: Sell

Stock Exchange	NYSE
Stock	TXN
Profit Margin	15.44%
Market Cap	41.94B
Avg. Vol. (3 month)	14,248,818
52 Week High	$33.98
52 Week Low	$18.06
Shares Outstanding	1.73 Billion
Dividend	$.10
Dividend Yield	.41%



Financial Ratios *for fiscal year of 2003*	
Current Ratio	3.5
Quick Ratio	2.6
Cash Ratio	2.6
Net Working Capital	.36
Inventory Turnover	9.0
Debt-to-Equity	.31
Return on Assets	.08
Return on Equity	.10
Earnings per share	1.1

Semiconductor Comparison		
	TXN	*Industry*
EPS	1.063	.10
PE	23.06	33.72
PEG	1.19	1.38
PS	3.48	2.34

Beta (published)	1.779
Revenue	12.20 Billion
Employees	34,154
Last Split Date	5/23/00

Executive Summary

Recommendation: SELL

The recommendation for Texas Instruments is to sell its stock, or ignore a future purchase of the . According to the valuations of TI, the current stock price is too high for the actual value of the company. Each valuation completed computed a value that was lower than that of the current price. Only one valuation model produced a value that was higher than that of the current stock price, which was price/sales valuation ratio under the method of comparables. Each valuation model used produced a value that was significantly lower than where Texas Instruments stock has been trading as of late, which was been in the mid to upper $20 range for the past year. The values produced in each model are as follows:

Residual Income - $10.60

AEG – $10.75

Discounted Dividends – $14.97

Discounted Free Cash Flows – $9

With these estimates in mind, the recommendation to sell is fairly strong. The price of Texas Instruments stock should be somewhere around the ten dollar per share range, considering the value computed in each model is fairly consistent.

The reason that TI's stock price is almost three times the expected value may be due to several reasons. Texas Instruments is in the technology sector, and more specifically the semiconductor industry. This industry is a very new industry, only developing over the past ten to fifteen years. It is quite possible the market hasn't developed a strong identity for the industry. It is very hard to compare firms in the semiconductor industry because if the variability in business segments between the respective firms. Texas Instruments is a very unique firm, with business segments unlike any other. Another reason for the price difference might be that the industry is on an upswing, as is the economy as a whole. Interest rates are at an all time low, and the unemployment rate is at its lowest level in several years, these facts may cause investors to be overly optimistic

Company Overview

Texas Instruments (TI) is 67 year-old, multi-billion dollar and global corporation headquartered in Dallas, Texas with thousands of employees strategically located throughout the world. The company is amongst the world's five largest semiconductor companies. Texas Instruments manufactures markets and sells high technology components/systems used in the commercial electronic industry. Historically, it has had variety of product lines in such diverse areas such as geophysical oil exploration, consumer products such as graphing calculators, software point of sale systems, digital military radar missile systems, and semiconductor products. The company has increasingly concentrated on digital signal processors, and on analog/mixed-signal integrated circuits. Semiconductors grew from less than 60 percent of revenues in 1996 to 87 percent in the boom year of 2000, which accounted for 85 percent in fiscal year 2003. Besides semiconductors, Texas Instruments has two other principal businesses: sensors/controls and educational products. The global corporation has several foreign geographic markets in Asia, Europe, United States and Japan. Texas Instruments has been traded on the New York Stock Exchange for several decades. Since its inception, management has always adapted to the changing needs of society, especially as technological innovation has modernized the economy. A prestigious corporation will never lose goodwill, only if products are designed to superior standards in the overall industry.

- *Semiconductors*

Texas Instruments semiconductor business generated 85 percent of the company's revenues in 2003. Its market leading real time technologies – programmable digital signal processors and high performance analog chips are the two most critical semiconductor products in an increasingly connected, mobile planet. The products are fundamental to a wealth of innovative communications. Centric electronic products advance broadband technology and the transforming Internet. Other products, ranging from application specific integrated circuits to micro controllers, are also building sustainable advantages for the corporation in discussion, and its customers in various key markets.

- *Sensors and Controls*

Sensors and controls consist primarily of electrical and electronic controls, sensors and radio frequency identification systems. Many instruments are sold to original-equipment

manufacturers and distributors. Most of the technologies are tangible materials used in a variety of applications. However, this particular division within the enormous firm attributes a miniscule amount of revenue. Management has confirmed that the division isn't and will never be the edifice of Texas Instrument's future prosperity.

- *Educational and Productivity Solutions*

Educational and Productivity solutions include graphing and educational calculators, are marketed primarily through retailers and directly to school districts through instructional dealers. Sales within this division have steadily increased because new calculators have been designed and manufactured. Furthermore, goodwill has been established as a direct result of the prestige of Texas Instrument's calculators. In conjunction with prestige, more people are attending institutions of higher learning, partly due to dramatic increases in population. As a result, a larger market exists for graphing calculators, especially since few companies have integrated the educational market. The future of this division looks prosperous because of market growth.

- *Conclusion*

The objective of this report is to estimate Texas Instruments fair market value and to decide if the company would be a good investment. Administrators look at relevant historical statements, analyze these statements and compare them in a ratio basis to the industry and economy as a whole. Future projections concerning income statements, earnings and the abundance of competitors in the semiconductor industry is thoroughly. By using information available to us, analyst will be able to establish a method of value of the corporation and tell if the investment monetarily exceeds opportunity costs. An abundance of

Business and Industry Analysis

Threat of New Entrants

The threat of new entrants in the semiconductor industry is generally limited by large capital requirements. Existing semiconductor players are more likely to enter smaller, but faster growing segments like the DSP market. Newcomers to the industry include Xilinx, Microchip, and Intel, which is currently in partnership with another semiconductor corporation. In the early days of the semiconductor industry, design engineers with brilliant ideas would often leave their

current employment and establish another company.[1] As the industry matured, setting up a chip fabrication factory requires billions of dollars; monetary amount entrepreneurs may never posses. The cost of entry makes it painful or even impossible for all but the biggest players to keep up with state-of-the-art facilities, typically costing over a billion dollars to build. No surprise that established players has had a big advantage. Regardless, there are signs that things could be changing yet again. A new phenomenon is that semiconductor companies are forming alliances to evenly distribute the costs of manufacturing. A highly regulated industry will never have a threat of new businesses entering its current market.

Threat of Substitute Products

The threat of substitutes in the semiconductor industry really depends on the segment. While intellectual property protection might stop the threat of new substitute chips for a period of time, within a short period of time companies start to produce similar products at lower prices. Copycat suppliers are a problem: a company that spends an exuberant amount of money on the creation of faster, more reliable chips that strives to recoup the research and development costs. Then along comes a player that reverses the engineers' system and markets a similar product for a fraction of the price. ASIC's could be tailored to reduce system cost, size and power consumption. OEM's might use these to gain a competitive advantage in the market. As power, speed and flexibility are increased, chip categories become more substitutable for each product. Reconfigurable logic like field programmable gate array is a serious threat to digital signal processors. The programmable logic is relatively new with a market share not fully developed. While the technology capabilities are still a subset of digital system products functionality, it offers higher performance and lower power consumption. For high performance, digital signal processors function implementing field programmable gate array at the same time with a microprocessor, which is a significantly cheaper solution. Since the product has been patented by engineers, the chance of substitution is minimal.

Rivalry Among existing Firms

In most industries in the United States, the average level of profitability is mostly influenced by the nature or rivalry among existing firms in the industry. For Texas Instruments, this is also a true statement. The semiconductor industry is indeed highly competitive industry, and the potential for high profits and market share drive the four main competitors in the industry

[1] www.investopedia.com

to high levels of competitiveness. In the semiconductor industry, within the technology sector, there are four main direct competitors with which Texas Instruments successfully competes. The companies include Intel Corporation, Freescale Semiconductors, INC., S.T. Microelectronics and Qualcomm Incorporated. Also, there exist several firms, which include Samsung Electronics, Renesas Technology Corporation, Toshiba Corporation, and Infineon, that are in the same industry as Texas Instruments.[2] Each company must compete with several successful semiconductor manufacturers in order to make a profit.

The semiconductor industry has experienced a mix of upturns and downturns in its relatively brief history. The industry first came about 60 years ago, Bell Labs inventing the first transistors, and new technological innovation coming out on a daily basis. Rapid growth is expected with the semiconductor market, in which 1/3 of the profits of the entire industry being allocated for research and development. While there are several firms in the semiconductor industry, there is a distinct difference in the size of the firms within the industry. Intel is obviously the industry leader with a market cap of 132.08 billion; more than double that of second place Qualcomm. Texas Instruments ranks third in both market cap and number of employees, behind Intel and S.T. Microelectronics.

The semiconductor industry is a ubiquitous industry. There are several firms in the industry, each that make a vast array of related products. While most of the products are related, they can also be very different from the competitor's products. Industrial standards are extremely technical, that firms are always competing to have the latest and greatest products on the market. It is often a horse race to see which company can pump out new products the fastest, and often those companies are the most successful. Therefore, the degree of differentiation and switching cost and consumers are attentive to price fluctuations, but on other products, such as a new or improved widget that has just been released, there may be a high degree of differentiation with one company having a distinct advantage.

There has certainly been a steep learning curve. It is extremely difficult to enter the industry, due to the amount of competition that already exists, and the high degree of technology that goes into production. Thus, competition mainly stems from firms already in the industry and consistent market shares. One area that Texas Instruments does not have a problem is the excess capacity department. Since the industry in a constant state of change, there is always a new

[2] http://biz.yahoo.com/ic/semico_cl_all.html

product that the customers are demanding. Therefore, firms often do not have to compete on price. Nevertheless, Texas Instruments is a leader in several categories, including revenue, net income, and earnings per share. The following illustration of Texas Instruments and some of its direct competition, figures taken from a yahoo finance website:

Direct Competitors Comparison					
Stock Symbol	*TXN*	*FSL*	*QCOM*	*STM*	*Industry Avg.*
Market Cap	41.94B	5.96B	63.21B	16.11B	294.59M
Employees	34,154	22,000	7,400	45,700	488
Rev. Growth	2.2%	N/A	30.60%	14.60%	9.80%
Revenue	12.20B	5.46B	4.67B	8.12B	136.92M
Gross Margin	44.37%	34.72%	69.88%	35.96%	38.66%
EBITDA	3.28B	1.04B	2.07B	2.01B	5.44M
Oper. Margins	15.27%	2.07%	44.16%	3.94%	6.02%
Net Income	1.77B	141M	1.63B	319.5M	63,000

Bargaining Power of Buyers

Texas Instruments, headquartered in Dallas, Texas, is a leader in digital signal systems and analog technology. The semiconductor company has innovative designs applied for engines that are the integral part of the Internet and various communication technologies. In addition, Texas Instruments specializes in several areas throughout the growing semiconductor market. Dozens of different product lines are divided into three areas: educational productivity solutions, general semiconductors and sensors and controls. General semiconductors being the major portion contributed to corporate revenues. In the research and development department, engineers create new computer chips applied in several venues, to insure the future success of the established business. Therefore, the bargaining power of buyers varies among the different product lines within all the divisions of revenue.

- *Semiconductors*

The largest area generating revenue is composed of fierce competition from an abundance of corporations. For example, engineers from the research and development department must continuously build new chips or the competition will design a chip making all

others in the market obsolete. As a result, the buyers such as car manufacturers have relative latitude, when as a client choosing a semiconductor company. An investor must remember that the buyers are corporations that produce applications for the various chips built by an enormous magnitude of companies. Sometimes a corporation, such as the current situation with TI, can become dependent on a particular customer. For instance, TI is the largest manufacturer of digital signal processors, a microscopic device used in cellular equipment. Nokia, a cell phone giant, is the largest client; therefore, when sales of Nokia's cellular phones decline, TI can expect lost sales as well. In addition, video and the imaging equipment used by both professionals and average adults have evolved into a digital solutions program; through a majority of interfaces still use analogs. The evolution of digital solutions has forced company officials to develop mix systems that currently produce yearly increase in revenue. Dozens of products within the corporate semiconductor portion serve hundreds of clients from across the spectrum. As a result, in a diversified field of clientele there are several choices.

- *Sensors and Controls*

The sensors and controls market is much smaller in magnitude, but is a major player in the feasibility of profits. The market is not as competitive as the semiconductor segment; however, its consumers are not as numerous. Buyers of sensors and controls have a small amount of options because few companies specialize in such an area or have the capability to compete against a global company. A typical household may have several Texas Instrument devices, yet consumers may be oblivious to the amount. Alarm systems, remote controls used for different household electronics and air conditioners might have had its electronic microscopic interior designed by TI. Engineers design equipment that corresponds with companies, which manufacture tangible substances, used by a typical American family. The price is mildly inelastic because corporate officials may decide to increase the price of the interior equipment; thus, forcing its manufacture of the tangible object to distribute the increase cost to the consumer or complicatedly finds a substitute. However, some competition does exist but not in a significant manner. Alarm companies may decide to use an alternative supplier, even one that produces better equipment. Competition is not easy to find, especially since its research and development can patent electronic design. Nevertheless, new companies may have the capability to outperform a global corporate leader.

- *Educational and Productivity Solutions*

In the educational and productivity division, tangibles instead of intangible objects are produced. Furthermore, its clients are not obscure businesses that manufacture a final product but instead individuals that buy TI solutions directly from the store. To illustrate, TI calculators are extremely popular amongst mathematicians that appreciate its complex functions. An alternative would be to buy a Casio, a less expensive but less reliable as a calculator. Almost all students, teachers, all professionals and all mathematicians would rather spend the extra money to buy a name brand calculator than an obscure one. Casio specializes in an array of electronics that as a simplex method, complex mathematical matrices, in which Casio is unable to develop. TI has several different styles of calculators, each being an improvement from a previous design. Few other companies can make such an audacious claim. As a result, TI calculators are completely inelastic because the consumer is lackadaisical about cost associated with a purchase. The global semiconductor corporation produces educational electronic toys. During the 1980's, popular toys such as Touch and Tell, Speak and Read, and various others were revenue generating tangible products. However, company officials decided to restructure and annihilated several electronic toys. Many people lost their jobs and manufacturing facilities throughout the United States were completely shut down, including a massive Lubbock plant. Now TI designs advanced military weapons and receive special contracts with the United States Government.

Bargaining Power of Suppliers

Texas Instruments is a company that sells semiconductors, sensors/controls and educational and productivity solutions. TI's semiconductor product accounts for over 85 percent of their revenue from 2003 (Edgar scan). Most of there revenue that they bring in comes from semiconductors, which is a highly competitive market. There are several companies nationally and internationally that compete each year to sell their semiconductors to cellular phone manufacturers such as Nokia and television manufacturers.[3] Suppliers are only powerful when competition is minimal and there are few substitutes for the product. There are more than enough competitors out there that are in the business of selling semiconductors throughout the world. The bargaining power of buyers is excellent because they have the choice of buying from several companies at the lowest price. The highly competitive market makes it extremely hard for suppliers to have bargaining power.

[3] Monica, Paul. *Don't Mess with Texas Instruments*. New York/CNN Money

Also, the semiconductor market is always improving technologically which puts pressure on the suppliers to efficiently produce top of the line semiconductors at the lowest price possible. TI has to look for ways to always be cutting costs and still make a profit. Costs are constantly switching to sell the product at the highest price that your buyer will pay without losing business. Furthermore, TI must differentiate themselves and their product from other competitors. They can do that by have the best technological semiconductors in the world. That requires them to put money into research and development, which could make the actually cost of their conductor to increase. Every part of the business is affected because of the competitiveness of this market; thus giving the corporation minimal bargaining power. Intel is a prestigious competitor, especially in the area of computer chips. Intel can afford to sell at low prices due to its size as a company. The semiconductor market is definitely not a monopolistic market; rather it's highly competitive. The rest of TI's products are sensors/controls and educational solutions, which is also a competitive market. These products account for less than 15 percent of their revenue in 2003. TI relies on product reliability and engineering expertise

Overall, due to a highly competitive market, TI lacks bargaining power and its competition that can effectively distribute products with superior qualities, TI is a languished bargaining power. Costs for manufacturing the product and costs for research and development puts limits on how low TI can sell their semiconductors to buyers. The buyers have most of power in this market in discussion. TI strives for the best quality which creates more costs; thus, making it difficult to sell their product at a lower price. In a highly competitive market, buyers don't have a lot of room to make an abundance of mistakes. In this particular market, differentiation is critical. If there is a product that no one else possesses, then demand will drastically increase-setting prices upwards, creating supplying power.

Competitive Advantage

The profitability of Texas Instruments depends on its position within all the areas it successfully competes. A firm must have a competitive advantage to sustain growth and outperform the competition. Diverse companies in an industry may have a variety of business strategies, each competent in its unique features. Two generic tactics have been conventional in finance, one being cost leadership and the other being differentiation. Both techniques measure the extent a company may be profitable, probability it will continue to infiltrate the market, and the current managerial philosophy.

Cost Leadership

Toward the conclusion of the twentieth century, attention had been placed on time compression, which is, reducing the time taken to bring innovative designs to the market. By suppressing time, a diverse company can lower cost and simplify the process of getting a final prototype. In addition, the advent of computer enhancement has allowed corporations, including a global tycoon such as Texas Instruments, to create inventive products that drastically improve existing applications. "Thanks in large part to fierce competition and also to new technologies that lower the cost of production per chip, within a matter of months, the price of a new chip can drop in half."[4] The semiconductor portion of Texas Instrument's must continuously patent more designs and strategically oppress the market before its competition integrates potential revenue. As a result, large semiconductor corporations have appropriated massive amounts of money for research and development. Texas Instruments has precociously established semiconductor-manufacturing sites in Asia and Europe. By strategically locating plants in other countries besides the United States, a firm could reduce unnecessary expenses due to currency fluctuations. The Internal Revenue Service tax code allows for deferment of taxable profit, if the corporation has plants or offices in a foreign country. Therefore, foreign subsidiaries lower taxable income; thus, creating an abundance of savings. Several factors allow for cost leadership in a variety of areas, particularly since Texas Instruments is the only firm to offer certain products, its continual patents diminish its competition, which allows the global corporation to have an enormous influence on price. The semiconductor portion of the business is the epitome of its foundation, but two additional divisions give the company in discussion a better competitive advantage.

Both the educational and productivity division and its sensors and controls market are as significant as the semiconductor arena. Tangible objects including calculators used by students in the academia world, sensors used in appliances such as air conditioners, are markets with little competition. In the two divisions, Texas Instruments had almost perfected absolute cost leadership. First of all, it develops the chips used in its sensors, controls, and famous calculators, instead of spending the additional money to externally purchase the necessary material. Furthermore, few competitors currently have integrated both markets; therefore, leaving an untapped economic potential for future growth.

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[4] *The Industry Handbook: The Semiconductor Industry*. 18 Sept. 2004 <www.investopedia.com>

Differentiation

There exist an abundance of dimensions that make Texas Instruments differentiation strategy the most successful and almost a niche for the diverse institution. According to its website, the board of directors "recognizes that a diverse, empowered workforce is a means for achieving a sustained competitive business advantage."[5] An assorted workforce brings a variety of designs, market strategies, and opinions in its research and development department. "Teaming is an approach based on the belief that diversity of input drastically improves decisions," and "diversity and teaming act as complementary forces."[6] Therefore, an industry based on innovation must have an employment foundation to sustain new ideas and expand current technologies. Chip makes must constantly go back to the drawing board to establish superior semiconductor products, the prestigious edifice of renowned Texas Instruments. The only solution is to hire employees with different experiences, and allow those individuals to discuss implementing sagacious designs. Customers have high expectations about a chips application, predominantly electronic manufactures that purchase significant semiconductor instruments. The ingenuity of its workforce brings about product variety.

All three divisions bring many distinct products that serve a variety of applications within several industries. For instance, the semiconductor division is a market leader in digital signal processors, which penetrates "over half the wireless phones sold worldwide."[7] During the technology boom of President Clinton's administration, the advent of cellular phones became extremely popular causing established telecommunication corporations to alter their current revenue base. Today, cell phones sales have doubled and will most likely continue to grow at paramount rates. As indirect connection, Texas Instruments has conspicuously designed and manufactured miniscule chips used inside a majority of the innovative cellular technology. Growth in the telecommunications industry leads to growth in the semiconductor industry, particularly firms that specialize in cellular chips. If the company continues to pressure its research and development department to precociously engineer original products with indistinguishable applications, then the future will illustrate inevitable prosperity.

Another segment the board of directors and management has decided to target is the growing need for military technology. According to the *Center for Public Integrity*, Texas

[5] www.ti.com
[6] Ibid.
[7] 6 Nov. 2004. <www.managingautomation.com/fullstory/450836>

Instruments, ranked 84th among all military contractors, had an excess of one billion dollars awarded from1998-2003. An interesting fact was that the company made campaign contributions to President re-elect George W. Bush and the despicable Republican National Committee.[8] Since the United States felt compelled to fight an unnecessary war, hundreds of corporations have profited, including Texas Instruments. The semiconductor division has implemented products that are used for missal defense systems, navigation equipment, and various different microscopic semiconductor chips with a defense application. Now the Republican Party controls all three branches of the government, fighting in Iraq seems to be abyss, military spending will continue to dramatically increase over the next several years. Opportunities have been established for the research and development department to engineer products for defense. The largest contractors with the pentagon are major buyers of semiconductor products, particularly products manufactured by the colossal giant Texas Instruments. Therefore, profits will be made both directly by contracts with the pentagon and by the other corporations that execute negotiations with the pentagon.

Throughout the years, tangible instruments known as calculators have given the company necessary good will. Most educators, students, and mathematicians are familiar with the corporations graphing calculators. To illustrate, many college professors require their students to buy a TI-83 calculator, normally for the complicated math analysis courses for business majors. Texas Instruments competitor Casio doesn't have the reputation to successfully compete in the education market, maybe because its products are considered complex to execute problems. Another important factor in Texas Instruments competitive advantage in the educational products sector is a lack of competitors. A diminutive number of current educational manufactures creates opportunity for the company, considering the fact more people are obtaining better educations and attending college. To further the scenario, the firm in discussion creates better versions of graphing calculators every few years.

Sustaining and Applying Competitive Advantage

Using historical data on the global semiconductor corporation, an investor realizes the company has the capital to sustain any previous business strategies. Furthermore, actions concerning the differentiation of products have proven evident through past results; more technological innovations are supplied by Texas Instrument products than its competitors. All

[8] Makinson, Larry. *Center for Public Integrity*. <www.public-i.org/pns/report.aspx?aid=385>

three distinct divisions contribute enormously to the success of the entire business. If one area is not performing to industry standards, another division could help save the company from absolute failure. In addition, over a billions dollars are spent annually in the research and development department, no matter if the company operates at a net loss for the fiscal year. In the semiconductor division, innovation beyond industry standards is a necessity if a business wants to be persistently competitive.

Accounting Analysis

Key Accounting Policies

Texas Instruments has several accounting policies that reflect the position of its financial health. The initial policy is inventory valuation allowances, which briefly lets investors know how much inventory allowances the company has every quarter. Comparisons with the quarterly inventory, past inventory, and forecasted numbers are utilized to determine the amount of inventory allowance for each quarter. Once the inventory is sold, management writes it off and the inventory is counted toward that quarter's allowance. Inventory allowances are important because it tells investors how effective the firm is at getting products out the door successfully. TI wants its inventory turnover to be high or its inventory allowance to be low. In addition, TI wants to get products out the door as soon as they are done being fully manufactured.

Another policy that company officials' value is the investment valuation. TI has most of its public and private investments in the technology market basically for research and development purposes. The company considers this an important policy because in the technology field, investing in research and development is critical for a company's success. Innovating new products or investing in business that innovate new technology for the market is beneficial. Access to more capital, due to investing, can create more spending for their research and development sector.

The third accounting policy TI deems important is a distributor allowance. As soon as a distributor receives the product, company officials report that particular product as revenue. Distributors usually have an allowance that is agreed upon with the manufacturer. There is typically a specified period of time when the distributor can return the product, only if it is obsolete. A time frame is predetermined with both the distributor and manufacturer before a sale can occur. The policy is extremely important for TI because it can change inventory levels,

overstate both revenues and sales. It is imperative for their distributor allowance to be accurate and stay at a low level. TI must balance the amount manufactured with market demand.

The fourth policy is income taxes, which administrators consider a significant issue to accurately assess. Therefore, net income is not overstated annually. The United States had several tax codes that directly and indirectly effect company manufacturing sites. TI must recognize that its deferred tax asset can be recovered. IF it cannot, then a reserve must be recorded as a valuation allowance in order to account for those deferred tax assets. TI could be taxed on those assets if it weren't recorded or recovered. The profitability would be less than assume otherwise, only if amounts would damage net income figures.

The last policy that management considers a key factor is long-term assets. Determining how long assets can last can be beneficial. The longer an asset is expected to be utilized the more money that a company can make from tangibles such as plant, property, and equipment. Evaluating its life and making sure that it lasts as long as possible is resourceful. TI considers its assets performance on a yearly basis. Long-term assets can result in shorter useful lives, different operating expectations, and lower market values for the assets.

Accounting Flexibility

No firm in any industry has the same accounting policies, and the semiconductor industry is no different. The industry in which a company operates is also a major factor in regards to how flexible the company can be in their disclosures. According to the textbook *Business Analysis and Valuation*, there are several disclosures in which every firm has some flexibility as to exactly how it will be presented.[9]

The first of which is the treatment of depreciation. An asset's depreciation can be calculated using the straight-line method, or an acceleration method. According to the annual report, property, plant, and equipment, are stated at cost and depreciated primarily on the 150-percent declining balance method over its estimated useful life. Also, TI chooses to write off fully depreciated assets against accumulated depreciation. Texas Instruments choose an accelerated method, different from industry leaders in the manufacturing of semiconductors, especially Intel. According to the 2003 annual report of Intel, they choose to report property, plant, and equipment at cost and depreciate using a straight-line method, an estimated useful life of 2-4 years for equipment, and 4-40 years for buildings. The reason for the difference in

[9] Palepu, Krishna G., Paul M. Healy, and Victor L. Bernard. *Business Analysis and Valuations*. 3rd Edition

preferences is not exactly conspicuous, but it could be from the ease of calculation of the straight-line method for the much larger corporation, Intel, or maybe just form management's preference for one method over the other. Also, the use an accelerated method allows TI to write down its property, plant, and equipment more in the asset's early years of use. This method may be preferred to the expedient rate technological change in the semiconductor industry, in which machines could become obsolete fairly quickly.

Another accounting disclosure in which all firms have some flexibility is in regards to their inventory. Companies can choose to use last-in-first-out (LIFO), first-in-first-out (FIFO), or an average cost method for calculating inventories. Texas Instruments states its inventories at the lower of cost or net realizable value, and cost generally calculated on a currently adjusted standard basis. This appears to be the standard in the industry, as Intel also calculates adjusted standard basis. This method approximates actual cost on an average (FIFO) basis, according to the TI and Intel reports, respectively.

Another business aspect in which companies can choose their method of disclosure is its policy for amortizing goodwill. According to the annual report, Texas Instruments had adopted a particular document for its disclosure of goodwill. This statement states that goodwill is no longer amortized, but is reviewed for impairment each year. The adoption of this statement, TI has ceased the amortization of goodwill, as of January 1, 2002. As a result of the change in accounting policy, Texas Instruments has reclassified $14 million dollars worth of intangibles as goodwill.[10] In addition, management has written off fully amortized acquisition related goodwill against accumulated depreciation. Texas Instruments competitors have adopted similar strategies. Both Intel and Qualcomm have adopted the Statement of Financial Accounting Standards No. 142, and effective 1/1/02, all remaining and future goodwill is subject to an impairment test once a year.

According to the text, another aspect of financial reporting is that most firms have some flexibility in reporting "their policies regarding the estimation of pension and other post-employment benefits."[11] On the Texas Instruments annual report, "the company provides various retirement plans for employees including pension, savings, and deferred profits sharing and retiree healthcare plans. Incentive plans provide for profit sharing payment and annual

[10] www.ti.com
[11] Palepu, Krishna G., Paul M. Healy, and Victor L. Bernard. *Business Analysis and Valuation.* 3rd Edition

performance." TI has a very complex post-employment benefits portfolio and the estimations used for the expected return on plan assets, and the discount rate used; vary greatly in the different regions of the world where Texas Instruments has operations. The estimates are largely based on past returns along with current and expected future economic conditions, along with assumptions of industry and competition growth.

There are several other areas of financial reporting in which TI could "influence" the numbers by using different accounting policies. Some other facts about Texas Instruments reporting, per the annual report, are listed below:

- Revenue from sales is recognized when title is transferred to the customer
- Shipping and handling costs are included in the cost of revenue
- Marketable equity securities and convertible debt securities are stated at fair value

There are many other areas in which TI has complete discretion on how to report the numbers. The semiconductor industry is not a highly regulated industry in regards to financial reporting, so there are many areas of the annual report that could be "influenced" by altering their accounting practices. Any potential investor of a company in the semiconductor industry must exercise great care when reviewing the company's financial reports, and realize that the numbers may not always tell the whole truth, but with some degree of investigation, the truth can usually be found.

Accounting Strategy

When a manager in a company has accounting flexibility, there is always a chance that a firms' true economic performance could be manipulated. However, there is also a high degree of probability that the firm employs honest managers who wish to give potential investors an accurate picture of the firm. Although the financial statements of public firms in the United States must be audited by an independent auditing firm, there is still a chance that a firm's statements could contain many aspects of deception. The area of financial reporting is so complex, with no two companies in the country being alike; never can there be enough rules and oversight to obliterate fraudulent information. If there was a surplus of rules and regulations, many firms may not be able to give potential investors a true picture of the company, and its core competencies. Therefore, accounting strategy is an extremely significant aspect of financial reporting. Analyst can try to contemplate some imperative questions in an attempt to better understand a firm.

One aspect of the company that can be looked at to evaluate their accounting strategy is to see if industry norms are followed. Upon evaluation of Texas Instruments, Intel, and Qualcomm's annual reports, most of the accounting policies remain consistent. The firms all have largely the same policy with regards to revenue recognition, expense recognition, and royalty recognition. Furthermore, Texas Instruments is found to adhere to major FASB standards in conjunction with the other firms.

Another aspect that must be investigated is whether the company has changed any of its accounting policies in the past several years. According to Ernst and Young LLP, the firm responsible for auditing Texas Instruments, reveals that management has only changes one accounting policy during the fiscal year. In 2002, an altercation occurred for policies reflecting accounting for goodwill and various different intangible assets. Although there was a change in policy, the decision was not made solely by management. The change was made because of the Statements of Financial Accounting Standards No. 142 that was released during fiscal year 2002.

Upon evaluation of Texas Instruments stock distribution, it was found that upper management does not own a significant portion of Texas Instruments stock. A relatively small amount of Texas Instruments stock is owned by insiders and management, although the company CEO is the second largest single shareholder.[12] Most of the firms stock appears to be in mutual funds. This fact would seem to tell us managers do not confront strong incentives to accounting discretion to manage earnings.

Also, no evidence could be found of Texas Instruments structuring any significant business transactions to achieve particular outcomes. All transactions seemed to be structured fairly similarly to other firms in the semiconductor industry. In addition, the corporation's procedure for making estimations seems to be consistent with the other major players in the industry. Texas Instruments process of assessment is largely based on historical numbers and projections of future economic growth in the industry, which is highly consistent with that of Intel and Qualcomm. Texas Instruments does include a complete explanation of their evaluation process for fear of giving away valuable company information.

Overall, the accounting strategy of Texas Instruments seems to be fairly consistent with the rest of the semiconductor industry. This fact seems to suggest that there are no major flaws in their reporting, and the company is painting a fairly inconspicuous picture of the form in all their

[12] http://finance.yahoo.com

accounting disclosures. Management seems to follow business law, particularly tax law, in a scrupulous fashion.

Quality of Disclosures

In the annual report, the board of directors, management, and administrators embellish the reality regarding Texas Instruments. The report reveals prosperity and infinite growth, superior performance in an expanding industry, and gloss over competition within the semiconductor division. An analyst must comprehend that the letter to shareholders must always exaggerate the truth, especially since the writers are strong stakeholders in the firm. Investors may feel the global corporation will bring massive earnings. However, financial disclosures found on the official corporate website, explains an alternative to the annual report: business is not going as expected. Notwithstanding, Texas Instruments has longevity in operations, beginning in the early twentieth century. The possibility a corporation of such size, age, and diversity to obliterate is miniscule.

Texas Instruments is an enormous semiconductor and products firm with the distinct divisions, each possessed by an abundance of accounting transactions. Financial notes written in reference to the financial statements are extensive and monotonous readings. Though the notes are tedious documents, its content is complete with vivid illustrations about the corporation's direction and historical data. For instance, in the financial disclosures published on the website elucidate, "...remaining semiconductor revenue fell 17 percent compared with 2001 due to decline in shipments resulting from lower demand for, in decreasing order, application-specific integrated circuits, microprocessors, micro-controllers, and standard logic products."[13] Every increase or decrease in a product is thoroughly examined; each is given at least one reason for the drastic change, whether positive or negative. To further simplify the notes, all documents are easily accessed by the official company website, in a link to the investors' section. Current or possible shareholders can conveniently obtain necessary information, considering the fact most businesses would rather not be as candid. A few reports explicitly explain restructuring actions to eliminate hundreds of employees. To illustrate, management officially "announced a plan to involuntarily terminate about 500 employees, primarily in manufacturing operations, to align resources with market demand."[14] In a competitive semiconductor industry, it's unusual to

[13] www.ti.com
[14] Ibid.

conveniently publish future downsizes. Analysts are candidly offered reasons behind changes made within the financial statements.

Accounting policies and assumptions are not as unequivocally perspicuous as performance alterations. First of all, research and development must be placed in consideration. No document discussed patents issued with inventive technology in the semiconductor sector, allowing an investor to wonder the exact accomplishments during the fiscal year. Payroll attributes significantly to research, but the work quality of engineers on staff is questionable, especially if employees are not being utilized properly. Furthermore, accounting records ignore the amount of money ascribed to capitalization, depreciation, or normal expenses related to research and development. Nor are tangible materials in the copious division given monetary value, mainly assets that possibly appreciate in value which is extremely important considering the historical cost format of accounting.

Most products are sold directly to manufacturing businesses; however, accounts receivable is eccentrically high. The amount of funds accredited to uncollectible accounts is never mentioned on corporate documents. Nor are various different factors such as indexes of defected rates, and customer satisfaction analyzed. Texas Instruments does believe in customer satisfaction, almost all companies are strategically positioned in that manner, to expand new products with technological innovation. Management mentions no description on process and performance expectations.

Texas Instruments has an excellent investor relations program. Through the punctilious website, a potential investor may purchase stock directly from the company rather than spend additional money to obtain a commissioned broker. The corporation has a contract with an electronic system that allows people to buy and reinvest dividends. Most competitors do not conveniently have an arrangement where prospective clients, shareholders that will own a fraction of the company, on its websites or autonomously.

Accounting Distortions and Solutions

- *Abnormal accounts receivable*

  Texas Instruments engages in direct selling; therefore, they typically do not use third parties, which cause increases to accounts receivable. Investors should be suspicious about monetary value attributed to the intangible account. To further complicate the issue, doubtful accounts dramatically decreased in 2003, when profits increased. Net

allowances seemed to arbitrarily adjust in conjunction with projected revenue; such correlation raises a possible red flag.

Solution: Management should develop company techniques to successfully decrease overall accounts receivable. Since professional business relations exist, administrators should force companies to engage in liquid transactions, maybe negotiate capital market instruments.

- *Increase in Inventories correlates with increase sales*

  The inventory buildup is due to increases, beyond projected sales, in finished product materials. Since the semiconductor is extremely competitive, manufacturing entities innovating technology every few months, Texas Instruments possibly couldn't materialize its assets, creating obsolescence. In addition, job loses were expected due to company wide restructuring.

Solution: Utilize corporate structure more effectively; never hire more employees than expected output. Push the Research and Development department to patent more products and engineers innovative process that gives the company a competitive advantage.

- *Large unexpected asset write-offs of marketable securities*

  Management imprudently exchanges asset with risky investments, resulting in massive losses. An investor must consider a unique fact: the global corporation does not buy television advertisement, not even for its graphing calculators, nor for public relations which normally creates goodwill. Corporations that have an enormous amount of money in securities allow investors to believe that growth is not a top priority. To further deteriorate the situation, the company receives stock from its clients in lieu of cash payment.

Solution: Never receive stock from clients, even if there is a great business relationship. Sales credited with marketable securities can arbitrarily decline, even if the industry is growing, resulting in unnecessary losses. Use revenue to create goodwill and advertise educational products via television, not in financial instruments. During the next several years, try to successfully sale most of the securities; use the monies to other departments as a means of expanding the overall corporation. Growth in client base, employment numbers, and revenue should be a new position for the semiconductor company.

Financial Ratio Analysis

Financial analysis is a corporate evaluation of the firm's position within an industry and its future growth potential. Essentially, the process employs a variety of methods, each with a unique feature. Every analysis involves the calculation of different ratios. Venture capitalist, investors, and managers use the information to determine necessary changes that must be made in company or risk associated with investment. The results will have an impact on the firm's reputation, effective interest rate demanded by third parties, and the possibility that managers may lose their jobs. Several methods will be implemented such as the trend (time series) analysis, cross sectional (benchmark) analysis and financial statement forecasting methodology.

- *Trend Analysis*

The overall ratio analysis is accomplished by using an abundance of formulas within five different sections over the previous five years. One such section is the liquidity ratios, which inform creditors about a company's ability to meet its maturing short-term debt obligations. The formulas are important because banks, businesses, and investors must determine any default risk associated with the company. In addition, management could use the information to adjust future borrowing habits, budget cuts to increase liquidity and thoroughly exam the reasons related to the problems in liquidity. Activity ratios on the other hand, determine how quickly various accounts are converted into sales or cash equivalent. Liquidity ratios do not always portray an accurate picture connected to a company's real liquidity, due to particular current assets and liabilities in possession. Therefore, various ratios exist to measure the activity of accounts receivables, inventory, and total assets. If accounts receivable and inventory turn over quickly, the money received from customers can be invested for a return, thus increasing revenue. Another ratio is leverage (solvency) which is a firm's capability of meeting the obligations of its long-term debt. The various formulas concentrate on the long-term financial and operating structure of the business. Solvency is a dependent variable upon profitability since its long-term debt can only be repaid if the firm is profitable. An indication on the financial health and effectiveness of management are the profitability ratios. To investors, these ratios are extremely important because no one wants to associate themselves to a company with poor earning potential since the market price of stock fluctuates in accordance with dividend payout, which is dependent on profitability. Finally, market value ratios are relates to the firms stock price to its

earnings or book value per share. Another useful application is the sustainable growth rate, a measurement of future potential of a firm. The trend analyses are essential in the field of financial examinations.

- *Cross Sectional Analysis*

Individual competitors are examined as an entire industry average. In the case with Texas Instruments, three separate divisions, each with its own competition or lack there of must be separately analyzed. Formulas from the Trend Analysis are used again, but with different companies' information. Therefore, investors could observe the potential risk and evaluate the opportunity cost allied with an array of businesses. If a company is falling short of standards established by leading businesses, one must comprehend the possibility of default or a restructure of particular alignments within a firm. However, if a business is a leader in innovation and establishes industry standards, new competition can never penetrate a market as to affect the leading firm; therefore, investment opportunity is essential. Texas Instruments has an advantage in areas where they design and implement products such as calculators because the lead the industry. In the semiconductor market, an abundance of competition forces Texas Instruments to allocate its resources to an expensive research and development.

- *Methodology*

Financial statements are an attempt to establish figures in order to assess the entity's financial strengths and weaknesses. For example, the numbers used at Texas Instruments are only approximations. As a result, the investors may have to look at the specific ratios of its major competitors. The numbers are not adjusted for inflation, a person looking through the financial documents published on the corporate website is not management may hedge particular numbers so the may keep their high paying salary. Texas Instruments is a global company and its inventory uses the United States accepted LIFO method and European accepted FIFO method. The difference in both accounting strategies may confuse the best of experts.

Trend Analysis

Texas Instruments trend analysis looked promising in the last five years. Analysts used the following ratios: earnings before interest, taxes, depreciation and amortization ratio, property, plant and equipment turnover ratio, operating cash flow ratio, profitability analysis, liquidity analysis, and capital structure analysis. The EBITDA ratio, a formula that focuses on cash operating items, was consistently less than one, averaging around .90 for the last five years. The

low average means that earnings are consistent with sales after the expenses are taken out. Property, plant and equipment turnover ratio indicates that sales are greater than long-term assets. This explains how well Texas Instrument, as a corporation, is managing its inventory and credit policies. Texas Instruments reveals both a decline and a slight increase in property, plant, and equipment turnover ratio meaning possibly that during the decline, management could have been trying to constrict company costs. The terrorist attack on September 11, 2001, probably had an affect on corporate revenues. Various different ratios used by analysts included the operating cash flow ratio, which indicates the extent the firm can cover its current liabilities from cash generated by operating cash flows. Texas Instruments operating cash flow ratio during the previous five fiscal years was not the best in the industry. Nevertheless, Texas Instruments generated enough cash flow in 2001 and 2002; however, for fiscal years 1999, 2000, and 2003 Texas Instruments didn't generate enough cash flow.

The performance of Texas Instruments in the last five years was improving until 2001, in which the entire stock market declined because of the terrorist attack in New York. The liquidity analysis exposed promise for Texas Instruments. In conjunction with promise, the current ratio steadily increased over the years meaning that assets exceeded current debt. Texas Instruments accounts receivable turnover ratio was above the industry average illustrating sales were covering what administrators didn't receive from buyers. Company officials are keeping their accounts receivable low and while perpetually selling innovative products. Texas Instrument's day supplies of receivables have been conveniently decreasing over the years. This means money is received from buyers in a faster fashion while sales per day gradually increase. Working capital turnover ratio proves how many dollars Texas Instruments can generate for each dollar invested into its business. An average of two during the previous five years illustrates that two dollars is received for every one dollar invested.

Historical profits have been declining since 1999 but have recently rebounded. Furthermore, the gross profit margin has been averaging around 40 percent, in which the revenues have been exceeding their direct costs associated with sales. The operating expense ratio is low resulting in the costs being only a small percentage of the total sales. Texas Instrument's net profit margin was about 15 percent on average, indicating that its net income after expenses is compared to total sales. Having a low net profit margin means that costs associated with production are high. Notwithstanding, the net profit margin was lower than

expected but started to increase in the year 2003. The asset turnover averaged around 0.6 a connotation that sales are less than their total assets or more assets have been acquired. Texas Instruments return on assets and return on equity are almost consistently identical in terms of fluctuation during the previous five fiscal years. Return on assets has fluctuated, indicating that Texas Instruments have been struggling to perform as a successful corporation. Management might not be investing well enough to generate the kind of revenues shareholders expected.

Texas Instruments capital structure analysis shows how well it's managing the debt relative to the amount of equity it possesses. The debt to equity ratio in the past has been on a steady decrease. Texas Instruments has been continuously using less money each year from amounts invested by shareholders to finance debt. Corporate officials have been doing an excellent job finding money in various places to expediently pay off debt. On the other hand, Texas Instruments currently have an estimated 1.73 billion shares outstanding, indicating a need for capital to successfully finance debt. Texas Instruments times interest earned ratio indicates over the years a sufficient amount of income has been able to cover interest expense. Then debt service margin has been slightly increasing over the years proving that enough cash from operating cash flows can compensate for long-term liabilities. The sustainable growth rate has been around 10 percent with a couple of stagnate growth for 2001 and 2002. All the financial numbers reveal growth is expected to increase around eight percent each year.

Overall, TI is a company with some promise to their future. They look to be making enough revenues and trying to keep debt low. Their growth in the future is an indication if they can become a major player in the technology field for semiconductors.

Cross Sectional Analysis

Texas Instruments has dramatically changed its product position during throughout the years. Innovation has kept the corporation above the competition, especially having three diverse divisions. Texas Instruments has been compared with semiconductor companies, though the two additional divisions are ignored. Both sensors/controls and educational products are not discussed because few competitors currently exist, since market share is an iota of the semiconductor segment. Therefore, the corporation in discussion has been compared with the semiconductor industry average from the previous five years. Two companies, Applied Material and Intel, financial statements are thoroughly analyzed.

Texas Instrument's current ratio has gradually increased during the previous four years, but the ratio still is less than the industry five year average. The competitors Intel and Applied Materials has a higher gross profit margin, operating expense ratio, and return on equity, all of which are ratios under the profitability analysis. Results are due in large part to lower cost, particularly accounts receivable, than normal industry standards. On a positive note, the asset turnover ratio is lower than the companies used in the analysis but higher than the industry average. Larger companies typically have higher asset turnover ratios than small or medium size companies. Ratios in the capital structure model reveal Texas Instruments debt service is miniscule compared to the two competitors; yet, the debt to equity ratio still exceeds the five year industry average. An investor must consider that enormous corporations are more likely to issue debt than smaller unfamiliar ones, which may only have a few hundred employees and low profits. A analyze must consider, equity doesn't reflect the numbers, even though Intel has a higher return on equity than Texas Instruments and Applied Materials. However, Texas Instruments larger debt-to-equity demonstrates that Intel has more net income while Texas Instruments has more total liabilities.

The corporation being analyzed is still larger than the industry concerning liquidity and profitability margins. Probably due to the fact that many of the companies engaged in the semiconductor field are much younger, and are not as large. Nevertheless, all companies used in the cross sectional analyses are stable businesses that will never go bankrupt, at least over the next several decades. Eventually mergers between competitors in the semiconductor industry will occur in the long-term. The reason for such a prediction is that growth is slow and future technological innovations will be fewer.

Forecasting

Forecasting can be a very complex process, in which many assumptions are made. This is exactly the case in the forecast of Texas Instruments future accounting data. Although assumptions must be made, these assumptions are not pulled out of thin air. To help an analyst make better assumptions, one could use various sources of information. These sources of information could include past financial statements of the firm, past financial statements from competitors, past economic data and future economic predictions, along with any changes made in accounting policy by the firm and any changes made in policy by the federal government. Other sources of information could come from numbers derived by the analyst himself, most

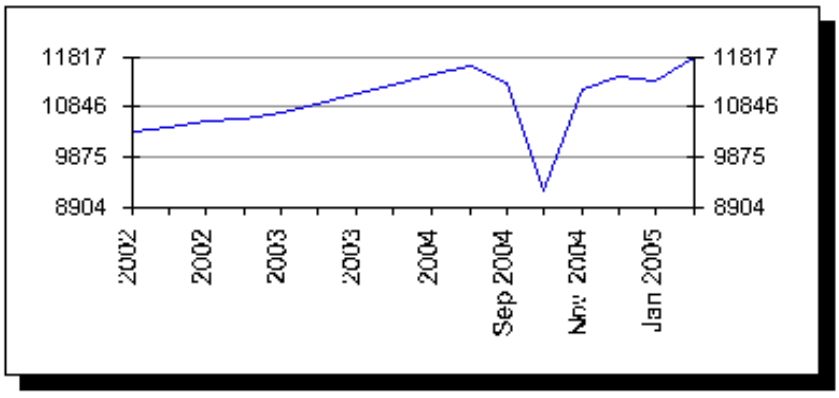
notably is the numbers gathered from the analyst's ration analysis of the firm, competitors, and also the industry as a whole. All of the above sources of information were used in the construction of the most likely future accounting data for Texas Instruments.

The construction of the 2004 numbers for Texas Instruments is obviously much easier than predicting the accounting numbers from 2005 onwards. When forecasting financial data for 2004, the analyst can use information from the company's quarterly reports. This gives you a much clearer picture of what the firm will look like at fiscal year end, because you have all the information for the year except for the last quarter. Basically, you are only predicting the last quarter of the year, instead of an entire year. It is also easier because future economic conditions are clearer in the short-run. An analyst can usually assume, with a reasonable degree of certainty that no big fluctuations are going to occur in the economy within the next three months. This cannot be said with forecasting accounting numbers five, or even ten, years down the road because a fairly constant short-run change can add up over the years and become quite a big change by the time five years go by. So in construction of Texas Instruments' fourth quarter data, the main source of data was the firm's third quarter financial statements. Even though these financial statements are not audited, we can assume that they can still show a fairly clear picture of the firm financial standing with three months left in the fiscal year.

Based on the previous sections financial ratios, there are several assumptions that analysts will be using in order to forecast the future performance of Texas Instruments. Based off of these ratios, analysts were able to make several assumptions that would be used to construct the forecasted financial statements. Over the past five years, the current ratio for Texas Instruments has been about 3.15. As you can see, over the next ten years of the firm, this value remains somewhat consistent. This is one of the most important ratios for a firm because it is a good measure of liquidity, and one that is often used to assess the value of many firms in the industry. Another ratio that is important to take into consideration, in any industry, is the debt to equity ratio. Texas Instruments' average debt/equity ratio over the past several years has been about .40, with not a lot of fluctuation. As you can see from the constructed financial data, this ratio remains fairly consistent with respect to past company performance. This ratio is an important indicator to the amount of credit risk to which the company is exposed. Another ratio, which must be evaluated when making forecasts, is the sustainable growth rate. Texas Instruments SGR has fluctuated quite a bit over the past five years, so it is harder to pinpoint an

average SGR, but it still needs to be taken into consideration. Many different ratios need to be considered when forecasting future performance, not just the ones mentioned, in order to make an accurate prediction. All ratios were analyzed in the forecasting, with more weight being put on the ratios, which had remained fairly consistent in value over the past five years. Because this fact will lead us to believe that the future ratios will be more consistent, when compared to the past ratios which fluctuate a lot from year to year. Another factor, which must be considered, is the industry growth rate, as well as the economic growth rate as a whole. In large part, the semiconductor industry is on the rebound after its two-year downfall, along with the rest of the tech industry, in 2001 and 2002. This can be seen very clearly in the financial statements of 2001 and 2002. Texas Instruments had a negative net income in these years, along with the two biggest industry competitors, Intel and Qualcomm, according to their respective financial statements. Since that time, the industry has realized a modest growth rate of about 3 to 4 percent, according to data collected from the industry. This was a critical assumption our team used in the forecasting portion of the report, and we expect this number to hold fairly constant, if not grow, over the next several years. Another assumption factored into our forecasts was that of the overall economy growth rate, as well as the inflation rate. The growth rate of the GDP in the United States has risen, although only slightly, each of the past three years. According to a website, the economy possesses a current GDP growth rate of 2.76 percent, an inflation rate or 2.65 percent, along with an unemployment rate of only 5.40 percent.[15]

Gross Domestic Product History and Forecast



[15] http://www.neatideas.com/gdp.htm

U.S. Gross Domestic Product Forecast

	Sep 2004	Oct 2004	Nov 2004	Dec 2004	Jan 2005	Feb 2005
Value	**11,319**	**9,179**	**11,188**	**11,437**	**11,355**	**11,788**
Standard Deviation	207.	180.	234.	254.	267.	292.
Correlation Coefficient	0.95	0.95	0.95	0.95	0.95	0.95

In the forecasts, analyst use the above information to predict future economic conditions, and most of the growth rates used in our forecasts came from economic data, as well as historical data from the firm. All things considered, the numbers are still assumptions. They are reliant on the analyst's best guess as to the future state of the economy, and the individual firm. No one person is able to predict the future, but it is possible to make an "educated guess" as to what will happen in the future. An assumption is also based on the validity of the financial statements produced by Texas Instruments. While in the previous report, we found no real evidence of the firm trying to falsify or trick the reader of their financial statements; it is still possible that some of the information may have been changed to look good to a potential investor. Also, we used data from the company's quarterly financial statements, which are not audited. Upon extensive research of the firm, analyst have concluded that Texas Instruments is an extremely stable, honest, and a prosperous company that should be profitable in the semiconductor industry for years to come.

Introductory and Valuation Sections

Security analyst uses both financial statements and data that professionals punctiliously compile for a firm to make investment decisions. As a result, a valuation process has been established as a means of determining which businesses are profitable. Bankers or venture capitalist use the information obtained through a meticulous procedure, an array of complex formulas, to develop prospective synergies a corporation such as Texas Instruments might offer. A compilation of charts, formulas, and methods reveal a true valuation behind sometimes the eccentric numbers accountants regurgitate. The general investment community depends on a

company's reality, not a fictitious summary written via a sycophant. Furthermore, an analysis can determine the probability current performance levels are likely to remain sustainable in the future. Professionals, especially corporate officials, can make important decisions affecting the success or transformation necessary for prosperity.

Methods Implemented for Analysis

- *Method of Comparable Valuations*

  Several measures of performance multiples, particularly market ratios, are analyzed within comparable industries of the firm being tested. Though Texas Instruments specializes in several areas, each distinct division has its own competition with doesn't apply to the entire business. The average number obtained by its competition serves as a benchmark within an industry. If a company falls below average, then it's not a profitable investment opportunity. However, if its valuation exceeds industry average, then investors know profitable opportunities exist. Various calculations formulated by the comparable valuation method are considered the simplest examination of all approaches. Thus, professionals prefer this approach verses more complex methods.

- *Discounted Dividends*

  The corporation in discussion has continuously issued dividends; therefore, making the discount method an appropriate valuation tool. Finance theory holds money decreases in value because of consistent inflation. As a prudent investor, one must consider the prevent value of currency. A formula has been devised that decreases dividends to a specific discount rate, adjusting yearly amounts to a current market value. This basic apparatus exterminates excess monetary amounts, creates a realistic insight, and establishes net worth. Investors astutely use the discount dividend model to determine a correct purchase price for stock.

- *Discounted Free Cash Flows*

  A future prediction based on historical data is compiled, allowing for analyst to determine stock price. However, instead of dividends being thoroughly tested, cash flow is examined. Cash flow from operations is subtracted from flow provided by investing activities to obtain free cash flow. In addition, a discount rate, obtained through a weight-average cost of capital formula, is calculated as a means of receiving a present value. Several steps involving different mathematical equations translate into the value

of equity and value per share. Industry forecasters can determine the future prosperity of a corporation.

- *Residual Income Valuation Model*

  This is another method used by professionals to scrutinize financial positions of a corporation. An investor computes both earnings-per-share, dividends-per-share, and book earnings to reveal normal income. Financial statements are analyzed more in the residual approach rather than the other various models. Once again, a continuity of years are forecast; thus, determining current valuation of Texas Instruments. Information concerning earnings-per-share and its counterpart dividends-per-share are found on yahoo, an Internet website crammed with information. In conjunction with the residual model, a similar calculation described as the long run average residual income perpetuity based on the price-to-book ratio is configured into intrinsic valuation techniques. Both methods are extremely similar in nature, used for an identical purpose, but only one model has an abundance of steps or formulas to determine final calculations. Analysts respect the residual models as quality foundation to determine valuations of corporations.

- *Abnormal Earnings Method*

  Accountants implement principles adherent to their profession, ignoring imperative financial decisions made by administrators. Revenue generated in financial statements is sometimes classified as abnormal because it doesn't reflect accurate numbers. Opportunity costs, value of the best alternative, in a business decision can't be evaluated by certified accountants. As a result, a several formulas have been devised to reveal the relationship between adjustments and market value of equity. Sometimes, management has an incentive to force accountants to legally exaggerate numbers. Since euphemisms are common in most corporations, adjustments are an important, especially in the mist of unethical business scandals. Discount values are decrease excess earnings, allowing the investment community to comprehend a company's true value.

Method of Comparables

The method of comparables uses the price/earnings ratio, price/book ratio, price/sales ratio, and dividends/sales ratio. All of these ratios allow analyst to capture an aspect of the firm that depicts an accurate value of the firm. For the method of comparables, an investor compares the firm Texas Instruments to other comparable firms in the industry. Five different competitors

of the corporation being analyzed have been meticulously chosen. According to a website, the five main competitors for Texas Instruments are Intel Corporation, FreeScale Semiconductor, S.T. Microelectronics, Applied Materials, and Qualcomm.[16] Although all of these companies are considered competitors of Texas Instruments, none of them represent a true competitor. The reason, the corporation being analyzed has three distinct divisions, each with its own niche and competition. All the listed competitors are related to Texas Instruments in some fashion. For instance, Intel, a firm that specializes in computer chips, which is strongly related to semiconductors. FreeScale and S.T. Microelectronics are largely semiconductor producing firms, but each is not involved in the sensors/controls, and educational products segments. Although all the companies possess some noticeable differences, these firms represent the core competition. The process involved in the methods of comparables is quite simplistic. Listed ratios were taken for each company using their respective 2003 year end financial statements, excluding Texas Instruments, since it's the firm of subject. Then, the average was taken of the competitors, excluding any outliners or negative numbers. There were no extremely large, small, or negative numbers, so each company's ratios were used in the analysis. After finding the average, it is quite simple to come up with a value, since most of the ratios have price-per-share as the numerator. Basically multiply the denominator and the industry average to get a price per share. The price using the price/earnings ratio was $17.46, compared to an actual price per share of 29.38, at the conclusion of fiscal year 2003. This number gets fairly close to the actual share price of Texas Instruments. The difference could be do with the lack of real competitors for TXN, or because there is a fairly large variation in the price/earnings ratios of the competitors, ranging from 16.7 to 37.86. The next ratio used is the price/book ratio. The same methodology applies for the calculation of this ratio as the ratio above. Using this ratio, a calculated expected price of 25.55, this is extremely close to the actual price. Some reasons for this could be that there is not as much forecasting need in this ratio, since the numerator is the book value of the firm, which is derived directly from financial statements. The price/sales ratio follows a value of 33.70, which is, again, fairly close to the actual value of the firm. Once again, the reason the number is a little higher than expected might be because of Qualcomm's fairly large ratio. Using the next ratio dividends/share, analyst computed a share price of 17.49. The method of comparables might not be as accurate in the case of Texas Instruments as with some other firms

[16] http://finance.yahoo.com

in different industries. The semiconductor industry, of the technology sector of the economy in general, possesses numerous distinct firms. Almost every firm in the industry conducts business a little different than the next, and each firm is involved in slightly different markets. For example, Texas Instrument's business segments include semiconductors, sensors and controls, and educational and productivity solutions. TI is the only company in the industry with these three distinct business segments. Taking this information into consideration, it is quite difficult to get an accurate representation of the value of TI using the method of comparables compared to, perhaps the automobile industry, where each company is solely in the business of manufacturing and selling cars.

Formulas Implemented for Valuation Models

Each of the next four valuation methods are quite different from the method of comparables. First of all, we will not be comparing the subject firm (TI) to that of its competitors. The valuations for Texas Instruments will solely be based on publicly available information about TI, including its published financial statements. For the next three valuation methods, there are a few very important numbers which first must be introduced and implemented in order to get an accurate valuation for Texas Instruments. These figures include the cost of equity, the cost of debt, and the weighted average cost of capital. Each of these figures are instrumental in valuing any corporation. Cost of equity and weighted average cost of capital will be the two discount rates used in the valuations. The weights assigned to debt and equity will represent their respective fractions of total capital provided, measured in terms of market values. First off, computing a value for debt is the easy part. To figure a value of debt, the book value of debt is used, assuming interest rates have not changed significantly in the past several years. As with most periods in U.S. history, there has not been much interest rate fluctuations lately, so the book value of debt will be used in this case. The market value of debt for TI can be found in their respective financial statements. For TI, the long term debt rate and short term debt rate both must be computed, then weights are aassigned to each one in order to arrive at an accurate cost of debt. For TI, information on the long term debt can be found in the notes to their financial statements, under the "debt and lines of credit" heading. Using the different rates listed for each category of long term debt, and the amount in each category, a weight is calculated for each category. This weight is then multiplied by each rate, to arrive at a cost of long-term debt. In the case of Texas Instruments, a rate of .0751 was calculated. Next, a

rate needs to be determined for the short-term debt. For the rate on the current liabilities, a fairly risky, short term, market rate was used. The rate used in this case was the rate on three-month commercial paper, since commercial paper is a fairly risky, short term, money market instrument. According to the Federal Reserve web site, the rate for three-month commercial paper is .0113. This is the rate used to compute the short-term cost of debt. After a value was assigned to the short and long term debt, a weight is placed on each type relative to its share of the total debt. For Texas Instruments, the weights were .671181 for the long-term debt and .328819 for the short-term debt, equaling a value of 1 as expected. Combined, the cost of debt for TI came out to .054196. The next estimation is the cost of equity. The cost of equity is computed using the capital asset pricing model. The following is the formula for the capital asset pricing model (CAPM):

CAPM = Rf + B(Rm-Rf)

Rf = risk free rate

B = Beta (systematic risk of the equity)

Rm-Rf = market risk premium

First, an estimate of beta is needed. To estimate the beta of a firm, the historical returns and the market risk premium are compared in a regression analysis. Historical returns for the firm, taking into consideration past dividend payments and stock splits, represent the “y” value in the regression, and the market risk premium for the same amount of periods represent the “x” value in the regression. The market risk premium can be calculated by using the market returns from a specific index minus the return on a risk free asset. In this case, the risk free asset used was the ten-year t-note treasury security, and the index returns user was that of the S&P500 for the past 60 months. Our historical prices for Texas Instruments were taken from finance.yahoo.com. As you can see from the regression analysis provided in the appendix, our estimated beta came out to a value of .19. This value seems low for the beta of TI, but since it gives an accurate representation of the market risk premium values and compared to the historical returns of Texas Instruments, this is the number used for the remainder of the valuations. It should be noted that according to finance.yahoo.com, the published beta for Texas Instruments is about 1.7. This number poses a significant difference between that and the estimated beta, which will be

discussed later in the sensitivity analysis section of the valuations. After the beta is found, the remainder of the CAPM formula is quite straight forward. The risk free rate is simply an average of the past returns from a risk free asset. The risk free asset used in this valuation was the ten year t-note rate. This rate can be found on the Fereral Reserve web site. An average was taken over the past 60 months, and a risk free rate of .045 was used. Now all the figures may be plugged into the the CAPM to come up with a cost of equity for Texas Instruments:

CAPM = .045 + .0526 (.04) = .0526

Using the CAPM formula, a cost of equity of .0526 was calculated for Texas Instruments. This number will be a very important computation for the remainder of the valuations.

The next figure needed for the calculations is the weighted average cost of capital. This number is another form of a discount rate that will be used for some of the valuation models. The weighted average cost of capital is calculated by weighting the cost of debt and equity capital according to their respective market values. The formula for computing the weighted average cost of capital (WACC) is:

$$WACC = \frac{V_d}{V_f} K_d (1-T) + \frac{V_e}{V_f} K_d$$

V_d = Value of Debt
V_e = Value of Equity
V_f = Value of the firm
K_d = Cost of Debt
K_e = Cost of Equity
T = Tax Rate

For the WACC formula presented above, there is several computations that must be made using information published by the firm. The value of debt is equal to the book value of debt for the company, which is located in the financial statement for the firm, as is the case for the cost of debt for the firm discussed previously. Barring any severe changes in interest rates, the market value of debt should be approximately equal to the book value of debt. All numbers for TI were converted to millions of dollars for ease of computation. The value of debt for TI equals

approximately 3,636 million. The value of equity is equal to the price per share (PPS) times the number of shares outstanding. Texas Instruments currently has about 1.73 billion shares outstanding and a price per share (12/31/2003) of 29.38. By multiplying these two numbers, a cost of equity of 50, 827.4 million is found. Next, the value of the firm is simple to calculate by using the two previous numbers. The value of the firm is simply the cost of debt plus the cost of equity. Adding these two numbers together, the value of the firm is equal to 54,473.4 million. The only number remaining is the tax rate. Upon investigation of the companies financial statements, the effective tax rate paid by Texas Instruments is approximately 37%. Using these numbers we can now calculate the WACC for TI. Upon input of the numbers, we calculate a WACC for Texas Instruments to be .051. Now all the necessary numbers are in place to proceed with the valuation models.

Residual Income Valuation Model

The residual income valuation model uses several factors to come up with a value of Texas Instruments. These values include the beginning book value of equity, earnings per share, and dividends per share. Also, the cost of equity is the discount rate used to compute a value for TI's price per share. To compute a value per share for TI using the residual income model, the forecasted book value of equity, earnings per share, and dividends per share are used. First, normal income must be calculated, which is equal to the discount rate (Ke) times the beginning book value of equity for the respective year. Next, residual income is calculated, which is equal to the respective years earnings per share times the normal income. After that, a present value factor must be calculated for each of the next ten years. This is accomplished by using the present value factor formula: 1/ (1+Ke) ^t Where Ke is the cost of equity and (t) equals the number of years discounting. Next a present value for the residual income must be found. This is accomplished by multiplying the present value factor by that year's residual income. Next, the present value of total residual income is added to the book value of equity per share for 2003. Then a terminal value is calculated, using the formula for perpetuity. This accounts for all subsequent years of Texas Instruments residual income, as it would be inconceivable to forecast financial information for TI to the end of the company's life. Finally, all of these values are added together to come up with a value per share to TI as of 12/31/2003. The value calculated for TI is $10.63. But, a significant amount of time has passed since then, so an up to date price is now needed. To accomplish this, we use a simple future value formula of: Current Price =

PPS/(1+(Ke/12)^(2/12). Using this formula, a current price per share for TI equals approximately $10.62.

Abnormal Earnings Growth Valuation

The next valuation method is the abnormal earnings growth valuation. This model uses earnings per share and dividends per share forecasts to value a firm. The first step in this process is to value to firms dividend re-investment rate at the cost of equity. This is accomplished simply by multiplying the previous year's dividends per share by the cost of equity. Next, cumulative dividend earnings are calculated by adding the respective year's dividend re-investment figure by the same yeas earnings per share. After that, "normal earnings" is calculated by multiplying the year's earnings per share times one plus the cost of equity. Finally, abnormal earnings growth is found by subtracting normal earnings from cum.-dividend earnings. The remainder of the process is quite straight forward. Simply compute the discount factor for each year as in the case of the residual income model. Then simply multiply the abnormal earnings times its respective discount rate to come up with the present value of each year's abnormal earnings. Finally, simply add the EPS from 2004, present value of AEG, and PV of terminal value to come up with total present value of AEG. Next simply divide this number by the capitalization rate (Ke) to come up with an estimated value per share for Texas Instruments. The value per share for Texas Instruments, adjusted for 11/01/2004 prices, is $10.752.

Dividend Discount Model

Another popular model for valuation is the dividend discount model. This is a fairly simple model which simply discounts future dividends by the discount rate (WACC) to estimate a value per share. Since Texas Instruments pays out a constant dividend of .10 per share, this model is quite easy to compute, and possesses a more accurate estimation than other models since there is not estimation of future dividends needed. This model simply requires a discounting of future dividends by the weighted average cost of capital to come up with a total present value of dividends. Then, discount the terminal value using perpetuity and the discount factor for the final year. After that, simply add the two numbers together to come up with a total present value of all dividends, divide by the value of equity, and the share price for Texas Instruments comes out to $14.97 adjusted for November 1, 2004 prices.

Discounted Free Cash Flows

The final valuation model used is that of the discounted free cash flows. In this particular model, the steps involved are just as the name implies, the discounting of future cash flows. This model resembles that of the discounted dividends model, except cash flows are used, not dividends. In this model, numbers from the forecasted financial statements are used, including cash flow from operating activities and cash flow from investing activities. Therefore, the more accurate the forecast of the statement of cash flows, the more accurate the estimated share price for the firm will be. By adding these two numbers together, we can come up with a value for the free cash flow to the firm. Next, as with the other models, compute a discount factor for each year using the cost of equity. Then, add the present values of the free cash flows for each year to come up with a total value of the free cash flows. Then compute a terminal value like the previous models as well. After that, use the total value of equity for the firm and divide this number by the total number of shares outstanding to come up with a value per share for Texas Instruments. The price per share, adjusted for November 1 prices, is approximately nine dollars.

Z-score = 3.7256 for fiscal year 2003

Table A.1

Residual Income Valuation
Texas Instruments

PPS (11/01/2004) = **12.0484**
Cost of Equity= **0.0526**

Period		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Terminal**
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	
Beginning BE (per share)		6.858	7.21	7.57	7.95	8.33	8.71	9.1	9.5	9.91	10.32	
EPS		0.56	0.59	0.62	0.64	0.67	0.70	0.73	0.77	0.80	0.84	
DPS		0.21	0.23	0.24	0.26	0.29	0.31	0.33	0.36	0.39	0.42	
Ending BE (per share)	6.858	7.21	7.57	7.95	8.33	8.71	9.10	9.50	9.91	10.32	10.74	
Normal Income		0.36	0.38	0.40	0.42	0.44	0.46	0.48	0.50	0.52	0.54	
Residual Income		0.20	0.21	0.22	0.23	0.23	0.25	0.26	0.27	0.28	0.30	0.32
PV factor		0.950	0.903	0.857	0.815	0.774	0.735	0.698	0.664	0.630	0.599	
PV of RI		0.194	0.190	0.187	0.184	0.182	0.180	0.179	0.178	0.177	0.177	6.084

BV Equity (per share) 2003	6.86
Total PV of RI	1.83
Continuation (terminal) Value	
PV of Terminal Value	3.37
Estimated Value Per Share	12.06
Actual Value per Share	29.38

Sensitivity Analysis

Cost of Equity

		10.0%	5.0%	2.5%	0.6%
Growth	0.0%	$6.93	$12.06	$15.12	$29.28
Rate	2.5%	$4.91	$15.11	n/a	-$25.46
	5.0%	$4.42	n/a	-$7.13	-$3.57

Table A.2

Abnormal Earnings Growth

Texas Instruments

cost of equity= 0.0526
Actual Price Per Share = 29.38
Growth rate= 0

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
	6.858											
EPS		$0.56	$0.59	$0.62	$0.64	$0.67	$0.70	$0.73	$0.77	$0.80	$0.84	
DPS		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
DPS invested at 5.26 %			0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
Cum-Dividend Earnings			0.595	0.622	0.649	0.678	0.708	0.740	0.773	0.808	0.844	
Normal Earnings			0.594	0.621	0.649	0.678	0.708	0.740	0.774	0.808	0.845	
Abnormal Earnings Growth			0.0011	0.0005	0.0005	0.0003	0.0001	(0.0001)	(0.0003)	(0.0005)	(0.0007)	0.0001
PV factor		0.950	0.903	0.857	0.815	0.774	0.735	0.698	0.664	0.630	0.599	
PV of AEG			0.00098	0.00043	0.00043	0.00026	0.00011	(0.00004)	(0.00017)	(0.00029)	(0.00041)	

EPS 0.56
Total PV of AEG 0.0013

Continuing Terminal Value 0.0001
PV of Terminal Value 0.00144
PV of AEG 0.599
Capitilization Rate 0.0526
Total PV of AEG 0.57

Value Per Share **10.784**
12/31/2003

Value Per Share **10.775**
11/1/2004

Sensitivity Analysis

Cost of Equity

		0.1	0.0526	0.025	0.006
Growth	0	6.72	10.76	13.12	14.74
Rate	0.025	3.21	10.8	n/a	-2.09
	0.05	1.14	n/a	5.42	7.12

Table A.3

Discounted Dividends Valuation Model
Texas Instruments

Cost of Equity= **0.0526**

PPS (11/01/2004) = **13.81401**

	Period	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Terminal**
	Year	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	
Dividends (per share)		0.21	0.23	0.24	0.26	0.29	0.31	0.33	0.36	0.39	0.42	173
Discount Rate (WACC)	0.051											
PV Factor		0.951	0.905	0.861	0.820	0.780	0.742	0.706	0.672	0.639	0.608	
PV of Dividends		0.200	0.208	0.207	0.213	0.226	0.230	0.233	0.242	0.249	0.255	

Continuing Terminal Value	
PV of Terminal Value	11.56
Total PV of Dividends	2.263
Estimated Value per Share	**13.824**
Actual Value per Share	29.38

Sensitivity Analysis

		Cost of Equity			
		10.00%	5.26%	2.50%	2.24%
Growth Rate	0.0%	$8.34	$13.82	$14.43	$29.41
	2.5%	$10.37	$24.29	$26.59	n/a
	5.0%	$14.43	n/a	-$22.06	-$19.77

Table A.4
Discounted Free Cash Flows Valuation
Texas Instruments

(all numbers in millions except per share data)

PPS (11/01/2004) =	9.006
Free Cash Flow from 2013 forward =	900
WACC =	0.051
Kd =	0.048
Cost of Equity =	0.0526

Period		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	
Cash Flow from Operations		2005	2007	2009	2011	2013	2015	2017	2019	2021	2023	
Cash Provided (Used) by Investing Activities		(743)	(844)	(851)	(839)	(896)	(914)	(947)	(1000)	(1050)	(1123)	
Free Cash Flow (to firm)		1262	1163	1158	1172	1117	1101	1070	1019	971	900	900
PV Factor		0.9515	0.9053	0.8614	0.8196	0.7798	0.7420	0.7060	0.6717	0.6391	0.6081	
Present Value of Free Cash Flows		1200.8	1052.9	997.5	960.5	871.0	816.9	755.4	684.5	620.6	547.3	
Total Present Value of Annual Cash Flows	8507.300											
Continuing (Terminal) Value	10731.12											
Present Value of Continuing (Terminal) Value	10731.123											
Value of the Firm (end of 1987)	19238.423											
Book Value of Debt and Preferred Stock	3646											
Value of Equity (end of 1987)	15592.423											
Shares Outstanding	1730											
Estimated Value per Share	**9.013**											
Actual Share Price	29.38											

Sensitivity Analysis

		WACC			
		15.0%	10.0%	5.0%	1.7%
Growth Rate	0.0%	$2.02	$3.87	$9.22	$29.54
	2.5%	$3.64	$6.45	n/a	$10.45
	5.0%	$8.21	n/a	$9.45	$11.73

Table A.5

Earnings Multiple Valuation
Texas Instruments

		2003			
Company	Symbol	**P/E**	**P/B**	**P/S**	**D/S**
Texas Instruments	TXN	23.38	3.32	4.30	0.10
Intel	INTC	20.05	3.85	4.40	0.16
Qualcomm	QCOM	37.86	6.54	12.99	0.28
Freescale Semiconductor	FSL	19.17	1.55	1.10	-
STMicroelectronics	STM	32.77	2.12	2.05	0.12
Applied Materials	AMAT	16.70	3.06	3.96	-
Industry Avg		25.31	3.42	4.90	0.19
Estimated Value of TI (per share)		17.46	25.55	33.70	17.49
Actual Price per Share		29.38			

Table A.6
Texas Instruments Statement of Cash Flows
(Millions of dollars)

	For the years ended December 31,		
	2003	2002	2001
Cash Flows			
Cash flows from operating activities:			
Net income (loss)	$ 1,198	$ (344)	$ (201)
Depreciation	1,429	1,574	1,599
Amortization of acquisition-related costs	99	115	229
Purchased in-process research and development	23	1	-
Write-downs of equity investments	42	808	80
Gains on sale of equity investments	(213)	(7)	(91)
Deferred income taxes	75	13	19
(Increase) decrease in working capital (excluding cash and cash equivalents, short-term investments, deferred income taxes, and loans payable and current portion long-term debt):			
Accounts receivable	(197)	(114)	958
Inventories	(194)	(39)	482
Prepaid expenses and other current assets	(183)	191	(235)
Accounts payable and accrued expenses	264	(81)	(687)
Income taxes payable	118	(5)	112
Accrued retirement and profit-sharing contributions	11	(27)	(389)
Decrease in noncurrent accrued retirement costs	(132)	(45)	(24)
Other	(189)	(48)	(33)
Net cash provided by operating activities	2,151	1,992	1,819
Cash flows from investing activities:			
Additions to property, plant and equipment	(800)	(802)	(1,790)
Purchases of short-term investments	(2,203)	(1,239)	(3,247)
Sales and maturities of short-term investments	3,288	2,775	4,040
Purchases of long-term cash investments	(2,199)	(1,907)	(488)
Sales of long-term cash investments	444	115	10
Purchases of equity investments	(22)	(26)	(254)
Sales of equity investments	778	44	103
Acquisition of businesses, net of cash acquired	(128)	(69)	-
Net cash used in investing activities	(842)	(1,109)	(1,626)
Cash flows from financing activities:			
Additions to loans payable	-	9	-
Payments on loans payable	(8)	(16)	(3)
Additions to long-term debt	-	-	3
Payments on long-term debt	(418)	(22)	(132)
Dividends paid on common stock	(147)	(147)	(147)
Sales and other common stock transactions	157	167	183
Common stock repurchase program	(284)	(370)	(395)
Decrease in restricted cash	261	-	-
Net cash used in financing activities	(439)	(379)	(491)
Effect of exchange rate changes on cash	(1)	14	(16)
Net increase (decrease) in cash and cash equivalents	869	518	(314)
Cash and cash equivalents at beginning of year	949	431	745
Cash and cash equivalents at end of year	$ 1,818	$ 949	$ 431

Table A.7
Texas Instruments Balance Sheet
(Millions of dollars, except share amounts)

	December 31,	
	2003	2002
Balance Sheet		
Assets		
Current assets:		
Cash and cash equivalents	$ 1,818	$ 949
Short-term investments	2,511	2,063
Accounts receivable, net of allowances for customer adjustments and doubtful accounts of $47 in 2003 and $60 in 2002	1,451	1,217
Inventories	984	790
Deferred income taxes	449	545
Prepaid expenses and other current assets	496	562
Total current assets	7,709	6,126
Property, plant and equipment at cost	9,549	9,516
Less accumulated depreciation	(5,417)	(4,722)
Property, plant and equipment (net)	4,132	4,794
Long-term cash investments	1,335	1,130
Equity investments	265	808
Goodwill	693	638
Acquisition-related intangibles	169	185
Deferred income taxes	626	618
Other assets	581	380
Total assets	$ 15,510	$ 14,679
Liabilities and Stockholders Equity		
Current liabilities:		
Loans payable and current portion long-term debt	$ 437	$ 422
Accounts payable and accrued expenses	1,496	1,204
Income taxes payable	250	293
Accrued retirement and profit-sharing contributions	17	15
Total current liabilities	2,200	1,934
Long-term debt	395	833
Accrued retirement costs	628	777
Deferred income taxes	59	129
Deferred credits and other liabilities	364	272
Stockholders equity:		
Preferred stock, $25 par value. Authorized 10,000,000 shares. Participating cumulative preferred. None issued.	-	-
Common stock, $1 par value. Authorized 2,400,000,000 shares. Shares issued: 2003 1,737,739,654; 2002 1,740,364,197	1,738	1,740
Paid-in capital	901	1,042
Retained earnings	9,535	8,484
Less treasury common stock at cost. Shares: 2003 5,401,665; 2002 9,775,781	(135)	(229)
Accumulated other comprehensive income (loss)	(159)	(262)
Unearned compensation	(16)	(41)
Total stockholders equity	11,864	10,734
Total liabilities and stockholders equity	$ 15,510	$ 14,679

Table A.8

Texas Instruments Consolidated
GAAP Income Statement Selected Items
(In millions of dollars, except per-share amounts)

	1998	1999	2000	2001	2002	2003
Net revenue	8,875	9,759	11,875	8,201	8,383	9,834
Cost of revenue	5,605	5,069	6,120	5,824	5,313	5,872
Gross profit	3,270	4,690	5,755	2,377	3,070	3,962
Gross profit % of revenue	37%	48%	48%	29%	37%	40%
Research and development (R&D)	1,265	1,379	1,747	1,598	1,619	1,748
R&D % of revenue	14%	14%	15%	19%	19%	18%
Selling, general and administrative (SG&A)	1,549	1,556	1,669	1,361	1,163	1,249
SG&A % of revenue	17%	16%	14%	17%	14%	13%
Profit (loss) from operations	456	1,755	2,339	(582)	288	965
Operating income (loss) % of revenue	5%	18%	20%	(7)%	3%	10%
Other income (expense) net	301	403	2,314	217	(577)	324
Interest on loans	76	76	75	61	57	39
Income (loss) before income taxes and cumulative effect of an accounting change	681	2,082	4,578	(426)	(346)	1,250
Provision (benefit) for income taxes	229	631	1,491	(225)	(2)	52
Cumulative effect of an accounting change	-	-	(29)	-	-	-
Net income (loss)	452	1,451	3,058	(201)	(344)	1,198
Diluted earnings (loss) per common share	0.26	0.83	1.71	$ (0.12)	$ (0.20)	$ 0.68
Weighted average shares (millions)	1,711	1,750	1,792	1,735	1,733	1,766
Dividends declared per common share	0.064	0.085	0.085	0.085	0.085	0.085

Table A.9

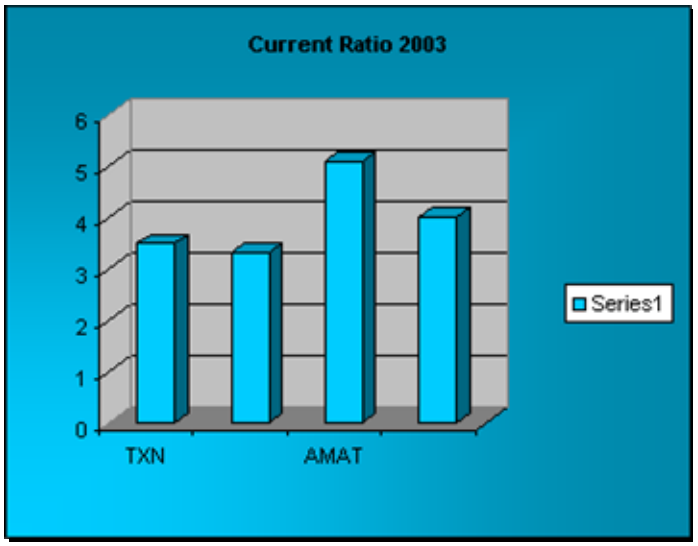
Cross Sectional Analysis

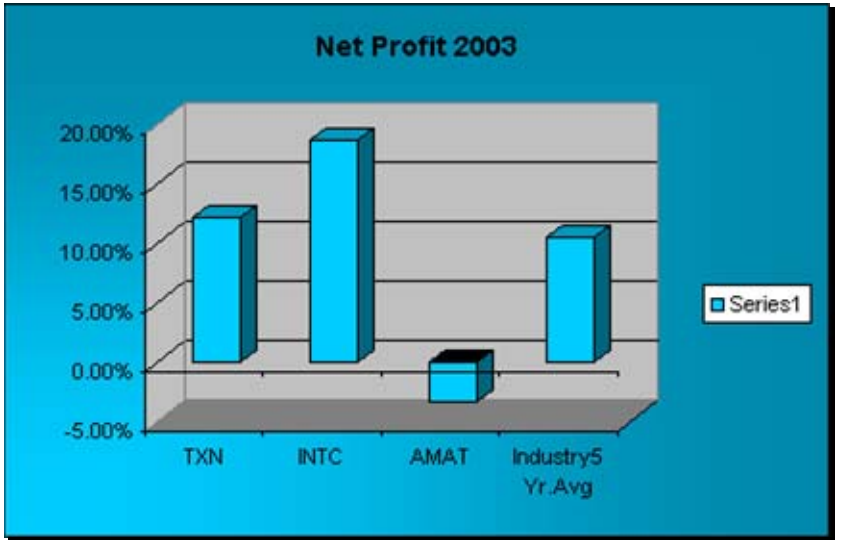
	2000				2001				2002				2003			
	TXN	INTC	AMAT	Industry 5 Yr.Avg	TXN	INTC	AMAT	Industry5 Yr.Avg	TXN	INTC	AMAT	Industry5 Yr.Avg	TXN	INTC	AMAT	Industry5 Yr.Avg
Liquidity Analysis																
Current Ratio	2.88	2.45	5.25	4.02	3.66	2.68	5.23	4.02	3.17	2.87	5.38	4.02	3.5	3.33	5.10	4.02
Quick Asset Ratio	1.05	2.08	3.54	3.25	1.03	2.15	3.66	3.25	1.12	2.30	3.98	3.25	1.49	2.78	3.90	3.25
Accounts Receivable T/O	5.38	8.17	9.48	8.95	6.85	10.18	6.12	8.95	6.89	10.40	4.84	8.95	6.78	10.18	4.90	8.95
Days supply of Receivables	67.84	44.69	38.49	40.78	53.28	35.85	59.66	40.78	52.89	35.10	75.42	40.78	53.83	35.84	74.42	40.78
Inventory Turnover	4.96	5.64	4.08	5.14	7.75	5.99	3.34	5.14	6.73	5.91	2.36	5.14	5.97	5.18	3.02	5.14
Days supply of Inventory	80.04	64.66	89.49	71.01	47.1	60.97	109.44	71.01	54.23	61.78	154.69	71.01	61.14	70.47	120.79	71.01
Working Capital T/O	2.24	-3.90	1.43		1.95	1.82	1.11		2	2.42	0.77		1.79	2.50	0.67	
Profitability Analysis																
Gross Profit Margin	48.00%	62.49%	50.77%	48.91%	29.00%	79.42%	44.29%	48.91%	37.00%	78.75%	40.63%	48.91%	40.00%	69.92%	35.84%	48.91%
Operating Expense Ratio	14.07%	69.18%	21.63%	13.01%	16.60%	40.68%	31.62%	13.01%	13.07%	33.39%	36.48%	13.01%	12.70%	31.72%	42.84%	13.01%
Net Profit Margin	26.00%	31.24%	21.58%	10.56%	-2.50%	4.86%	6.92%	10.56%	-4.10%	11.65%	5.31%	10.56%	12.20%	18.72%	-3.33%	10.56%
Asset Turnover	0.67	0.70	0.91	0.69	0.52	0.60	0.75	0.69	0.57	0.61	0.50	0.69	0.63	0.64	0.43	0.69
Return of Assets	17.30%	21.97%	19.57%	7.24%	-1.30%	2.91%	5.17%	7.24%	-2.30%	7.05%	2.63%	7.24%	7.70%	11.97%	-1.45%	7.24%
Return on Equity	24.30%	28.23%	29.05%	9.73%	-1.70%	3.60%	6.68%	9.73%	-3.20%	8.79%	3.35%	9.73%	10.10%	14.91%	-1.85%	9.73%
Capital Structure Analysis																
Debt to Equity Ratio	0.4077	0.2846	0.4844	0.1000	0.3283	0.2390	0.2921	0.1000	0.3675	0.2469	0.2750	0.1000	0.3073	0.2457	0.2781	0.1000
Times Interest Earned		10.53	9.81		9.54	5.74	19.52		5.05	22.59	4.25		24.74	39.23	-6.69	
Debt Service Margin	1.80	5.37	46.02		1.50	4.97	41.11		2.39	5.92	12.20		5.45	6.94	21.40	

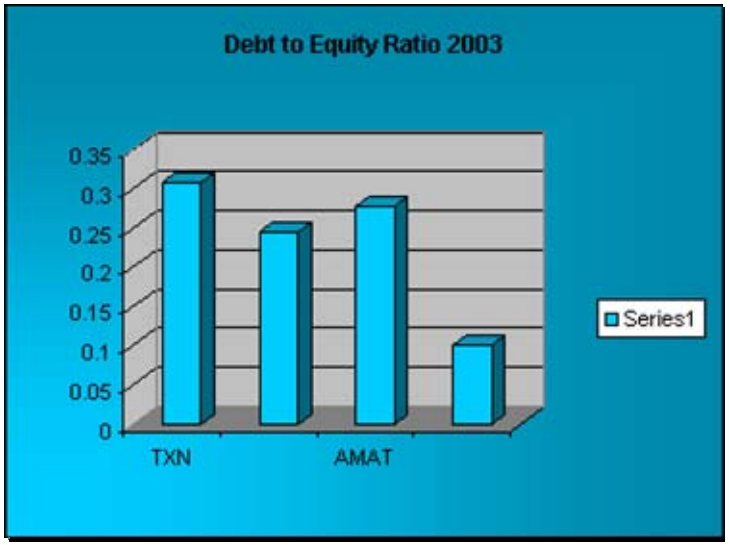
Table A.11

	1999	2000	2001	2002	2003
Liquidity Analysis					
Current Ratio	2.36	2.88	3.66	3.17	3.5
Quick asset ratio	0.997	1.05	1.03	1.12	1.49
Accounts receivable turnover	5.11	5.38	6.85	6.89	6.78
Days supply of receivables	71.43 days	67.84 days	53.28 days	52.98 days	53.83 days
Inventory turnover	5.67	4.96	7.75	6.73	5.97
Days supply of inventory	64.37 days	80.04 days	47.1 days	54.23 days	61.14 days
Working capital turnover	2.67	2.24	1.95	2	1.79
Profitability Analysis					
Gross profit margin	48.00%	48.00%	29.00%	37.00%	40.00%
Operating expense ratio	15.90%	14.07%	16.60%	13.07%	12.70%
Net profit margin	15.00%	26.00%	-2.50%	-4.10%	12.20%
Asset turnover	0.6326	0.6694	0.5197	0.5711	0.634
Return on assets	9.40%	17.30%	-1.30%	-2.30%	7.70%
Return on equity	15.15%	24.30%	-1.70%	-3.20%	10.10%
Capital Structure Analysis					
Debt to equity ratio	0.6097	0.4077	0.3283	0.3675	0.3073
Times interest earned	7.24	10.78	9.54	5.05	24.74
Debt service margin	2.14	1.8	1.5	2.39	5.45
Sustainable Growth rate	13.80%	23.20%	-2.90%	-4.60%	8.80%

Table A.10


Current Ratio 2003
6
5
4
3
2
1
0
TXN
AMAT
Series1


Net Profit 2003
20.00%
15.00%
10.00%
5.00%
0.00%
-5.00%
TXN
INTC
AMAT
Industry5 Yr.Avg
Series1


Debt to Equity Ratio 2003
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
TXN
AMAT
Series1