Industrial and Financial Economics

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Company Valuation
In mergers and acquisitions
A study of AT&T/McCaw

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Abstract

Mergers and acquisitions are one of the popular topics in business today, since they characterize the new economy: pressure of global competition, development of technology and disappearance of country boundaries. The purpose of this thesis is to study the valuation processes and approaches in mergers and acquisitions by analyzing the AT&T/McCaw case. Free cash flow approach is emphasized. CAPM and WACC are applied to calculate the cost of capital. The method to translate business environment into future financial performance and translate financial performance into value are presented in this thesis.

The result is that the historical net income has no effect on it future cash flow. On the contrary, McCaw's potential profitability and its business environment such as the change in technology, growth rate of market size (subscribers), market share of McCaw are the determinants for McCaw's economic value.

Key words: Free cash flow, CAPM, WACC, Mergers and acquisitions, valuation

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1 Introduction

1.1 Background

In 1999, the amount of global mergers and acquisitions reached $3.43 trillion, which is 36 per cent higher than those in 1998. From the global views, the United States accounted for about half of all mergers and acquisitions, followed by Europe, the second largest market, which accounted for about 30 per cent of the total.[1] The current wave of mergers and acquisitions are very different from the four past waves. The globalization of world economy makes the amount and number far exceed the past. Companies are merging not only to cut costs and shrink capacity but also to gain access to new technologies, new markets and new skills in order to survive in globally competitive environment.

According to Patrick A Gaughan's research[2], four periods of high mergers and acquisitions waves have taken place in the history of the United States. The example of waves in the United States is taken to explain the characteristics of mergers and acquisitions, which is high levels of mergers and acquisitions followed by periods of relatively fewer. The four waves occurred between 1897 and 1904; 1916 and 1929; 1965 and 1969 and 1981 to the 1990. These activities motivated major changes in the structure of American business. They helped transform American industry from a collection of small and medium-sized businesses to the current multinational corporations. Each mergers wave developed for different reasons and produced different results.

The first mergers and acquisitions wave started after the Depression of 1883, peaking between 1898 and 1902 and ending in 1904. The many horizontal mergers and industry consolidations of this era often led to the appearance of a monopoly. For this reason, this merger period was characterized by horizontal mergers and creating large monopolies.

Due to the strict antitrust environment of the 1920s, the second wave was characterized by fewer monopolies, more oligopolies and many vertical mergers

[1] *Business Credit*; New York; Jun 2000, pp. 22-25.

[2] Gaughan, Patrick A(1991) *Mergers and Acquisitions* New York : HarperCollins

and acquisitions. However, while these business combinations involved firms that did not directly produce the same products, they often had similar product lines.
The third merger wave featured a historically high level of merger activity. This was brought about by a booming economy. During this wave, relatively smaller firms targeted larger firms for acquisitions. The conglomerates during this period were diversified in their product lines. The term 'diversified' was generally applied to the firms that have some subsidiaries in other industries but a majority of their production within one industry category.
The characteristic of the fourth wave was the predominant role of hostile mergers. Although the absolute number of hostile takeovers was not high in respect to the total number of takeovers, the relative percentage of hostile takeovers in the total value of takeover was high. The fourth merger period can also be distinguished from the other three waves by the size. Some of the nation's largest firms became the target of acquisition during the 1980s.[3]

1.2 Problem discussion

The success of a merger or acquisition lies in a lot of issues such as corporate strategy, valuation, risk, and integration...etc. A merger and acquisition can be negotiated for months. But a core question is how much you will pay for this merger or acquisition? Is the price appropriate? . Mergers and acquisitions can fail because of overprice, which results in destroyed shareholder value.
In 1992, Craig O. McCaw, the founder and CEO of McCaw Cellular discussed with Robert Allen, Chairman and CEO of AT&T about the merger of two companies. One reason was that AT&T sold cellular phones but offered no cellular service, while McCaw offered cellular service but sold no equipment. Such a deal would enable AT&T to enter the wireless industry and at the same time provide McCaw Cellular Communications, Inc. with the needed capital to exploit its cellular operating licenses. In addition, such a deal between these two companies would offer McCaw AT&T's undisputed expertise in the industry and its global marketing and sales-force power to expand its overseas presence. McCaw would be AT&T's cellular arm and could help it expand into Europe, where laws prohibited wired services but did not restrict cellular service. Craig

[3] Gaughan, Patrick A(1991) *Mergers and Acquisitions* New York : HarperCollins, pp. 10-42.

believes that mergers would enable McCaw Cellular to take the next step in both market and technical dominance. [4]

1.3 Purpose

During the negotiation, Craig O. McCaw and Robert Allen would concern lots of issues. They needed to integrate this acquisition into their corporate strategy and manage culture conflicts. They needed to consider the antitrust regulation. They needed to confirm bid strategies and tactics and choose acquisition pattern. All these issues involved a key question 'How much should AT&T pay to seize McCaw? '

The stock transaction of McCaw was valued at approximately $12.6 billion [5]. The total assets of McCaw were $9.2 billion, including $4.9 billion long-term debt.[6] The net income of McCaw was negative[7], However, AT&T completed this acquisition at $11.5 billion[8] in 1994. Why did AT&T acquire a loss company for such price? Why are there various values for McCaw?

The purpose of this thesis is to apply valuation approach to evaluate McCaw and tries to discover the factors that affect McCaw's value.

Value is the intrinsic worth or price of good or service. Earlier economists, going back even to Aristotle, made the distinction between value in use and value in exchange. [9] The value in this thesis is defined as the value in exchange.

In order to achieve the above objectives, I define my research questions as follows:

- What is the concept of 'value' for a company?
- How to evaluate McCaw?

The second research question can be divided into two sub-questions as follows:

- Which valuation approach is recommended to evaluate McCaw?
- How to use this valuation approach to evaluate McCaw?

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[4] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523

[5] http://www.att.com/press/0893/930816.cha.html

[6] Ibid,.

[7] In appendix 4, the income statement of McCaw show that the net incomes were respectively negative in 1989, 1990, Sep of 1992. the net income in 1990 was positive because of gain on assets sold.

[8] http://www.attwireless.com/press/releases/2001_07/070901_split.html

[9] Donald Rutherford (1970) Dictionary of Economics, London and New York, pp. 481.

1.4 Scope and limitations

In this thesis, I only evaluate the McCaw Company. In the evaluation process, I have not concerned the factors such as politics, economic cycle, inflation that could affect the financial performance of McCaw. Some of the unknown information also relies on assumptions. Since there are too many variables that are not certain, I have not applied scenario analysis for the final evaluation.

1.5 Thesis outline

This paper is organized into five parts (See appendix 9). The thesis outline provides a general outline of this study. The first part contains the background, problem discussion, purpose, scope and limitation.

Part II

The research method will be introduced. The reliability and the validity of method will be demonstrated as well.

Part III

First the basic concepts will be defined. Then the theoretical framework will be established.

Part IV

The AT&T/McCaw merger will be analyzed to illuminate the valuation method and processes.

Part V

Some conclusions will be drawn.

2 Methodology

Research methodology covers formulation of the research problems, the development of a theory or the theoretical framework, the collection, analysis and presentation of empirical data and guidelines for writing. In this chapter, I will present the methods to solve the research problems and demonstrate the reliability and validity in my research.

2.1 Literature study

In order to formulate a clear picture of value and valuation approaches, I performed an extensive literature study. The study helped me to understand the core concepts and basic theories. The book 'Corporate finance a valuation approach'[10] provided me with an extensive knowledge of valuation processes and principles .The book 'Valuation: measuring and managing the value of companies' gave me a wide knowledge of valuation approaches. But, I found it difficult to find enough information concerning AT&T and McCaw, The Internet and the digital library in Göteborg University gave me a plenty of information regarding AT&T and McCaw.

2.2 Data collection

The data used in my thesis are from three different sources. One part is from the annual reports of AT&T and McCaw, including the balance sheets, the income statements, and the cash flow statements. One part from the book 'case studies in finance: managing for corporate value creation'[11]. One part from the website of AT&T. I compared the data from different sources to ensure the quality of data.

[10] Simon Z. Benninga, Oded H. Sarig,(1997) Corporate finance a valuation approach,

[11] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523-560

2.3 Research method

2.3.1 Qualitative and quantitative approaches

My thesis is a mixture of a quantitative and qualitative study. Quantitative research is objective; qualitative research is subjective. Quantitative research seeks explanatory laws; qualitative research aims at in-depth description. Quantitative research measures what it assumes to be a static reality in hopes of developing universal laws. Qualitative research is an exploration of what is assumed to be concerning a dynamic reality[12]

In my thesis, the qualitative approach is applied to explain the concepts, compare different valuation approaches and study the valuation processes. The quantitative approach is applied to forecast financial performance and translate financial performance into value.

2.3.2 Deductive and inductive approaches

Deductive means that we draw conclusions through logical reasoning. Deduction requires that the conclusion must follow from reasons. Inductive is to draw a conclusion from one or more particular facts or evidence.

In my thesis, I apply the deductive approach to compare various valuation approaches and figure out their weaknesses. I also use deductive approach to explain the valuation processes and principles.

2.3.3 Exploratory, descriptive and explanatory approaches

Exploratory is to introduce grounded theory but provide a simple answer. Descriptive is to observe and then describe situations and events. Explanatory discovers why events turn out as they do instead of just describing what occurs. [13]

In my thesis, I apply the exploratory approach to explain the concepts and valuation models and use the descriptive approach to present the evaluation processes and the value of McCaw.

2.4 Validity and reliability

The validity and reliability of my thesis depend on how to collect the data, where they are from, and how to deal with them. The validity can be defined as the

[12] http://socrates.fortunecity.com/qvq.html

[13] http://www.ahp.hhsweb.com/kraut/590Fall2001/..%5C590Fall2001%5C4thLectureResearchDesign.ppt

ability of an instrument to actually measure what it is supposed to. In my thesis, the definition of variables to forecast the revenue of cellular market and revenue of McCaw referred to the book 'Case studies in finance: managing for corporate value creation'. [14] The assumption to forecast also referred to this book. [15] My secondary data is collected from reliable sources and then compared to the primary data. [16]

The term reliability implies that the research would draw the same conclusion if the investigation were repeated using another sample, on another occasion. It means method is reliable enough to achieve the research purpose. In my thesis, the methods to forecast the cellular market and McCaw's annual revenue are introduced in the book 'case studies in finance: managing for corporate value creation'.[17]

All the material and data collected for this thesis are based on facts and original data. If another researcher starts from the same basis with the same assumptions, undoubtedly, he or she will get the same answers as I have.

[14] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523-560

[15] This case was prepared by Michael J. Jnnes and William J. Passer under the direction of Professor Robert F. Bruner. See Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523.

[16] I compared the data from books with original annual reports of two companies.

[17] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523-560

3 Theoretical framework

3.1 Definition of concepts

3.1.1 Mergers

A merger takes place when two or more firms combine to form a single enterprise, owned by a single set of stockholders to a single management staff. Mergers are classified according to how the merger takes place, the management's attitudes toward the merger and relationships between the merging parties. The two major means by which firms merge are the sales of assets or the sale or exchange of stock. Mergers may increase profitability by reducing costs, improving cooperation, removing ineffective management or eliminating competition.

3.1.2 Acquisitions

An acquisition is the purchase by one company of a substantial part of the assets or securities, normally for the purpose of restructuring the operations of the acquired entity. The purchase may be a division of the target firm or a substantial part of the target's voting shares. Bids are sometimes directed towards the acquiring firm's own shareholders, as in a minority buyout or in a leveraged buyout (LBO). For example, where a group of investors, typically involving the firm's own management, acquires all the outstanding voting shares.

3.1.3 The concept of value

In the most general sense, the terms mergers and acquisitions refer to the exchange of ownership control of a business enterprise. Company A and Company B may merge and form a new composite company; Company A may purchase or acquire Company B, or vice versa. In either situation, it is imperative that both companies should be valued either formally or informally. [18]

There are several perspectives of value as follows:

Book Value - The book value of a company is obtained from the balance sheet by taking the adjusted historical cost of the company's assets and subtracting the

[18] Link, Albert N. (1999) The Art and Science of Business Valuation, Westport, Conn. London : Quorum, pp. 2-3.

liabilities. Tangible book value is calculated in the same way as finding regular book value; intangible assets are possibly excluded in the calculation. The book value does not provide a true indication of a company's value, nor does it take into account the cash flow that can be generated by the company's assets.

Liquidation value **--** Liquidation value is another benchmark of the company's value. It is measure of the per share value that would be derived if the firm's assets were liquidated and all liabilities and preferred stock were paid. Liquidation value may be a more realistic measure than book value. If accurately computed, it may be a more accurate indicator of the true value of the firm's assets.

On the other side, the liquidation value does not measure the earning power of the firm's assets. These assets may have different values depending on the user. If the firm is using its assets very efficiently, the company's value may be well in excess of the liquidation value. [19]

Fair market value Fair market value is the price at which the property would change hands between a willing buyer and a willing seller when the seller is not under any compulsion to buy and the buyer is not under any compulsion to sell, both parties having reasonable knowledge of the relevant facts.

A determination of fair market value will depend upon the circumstance in each case. No formula can be devised that is applicable to the multitude of different valuation issues arising in estate and gift tax cases. A sound valuation will be based on all relevant facts, but the elements of common sense, informed judgment and reasonableness must enter into the process of weighing those facts and determining their aggregate significance.[20]

Economic value The economic value is the value of the expected earnings from using the item discounted at an appropriate rate to give a present-day value. The problem is not in defining the measure but in actually estimating future earnings, as this implies knowledge of what is going to happen. [21]

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[19] Gaughan, Patrick A. Mergers and acquisitions New York : HarperCollins , 1991, p. 576

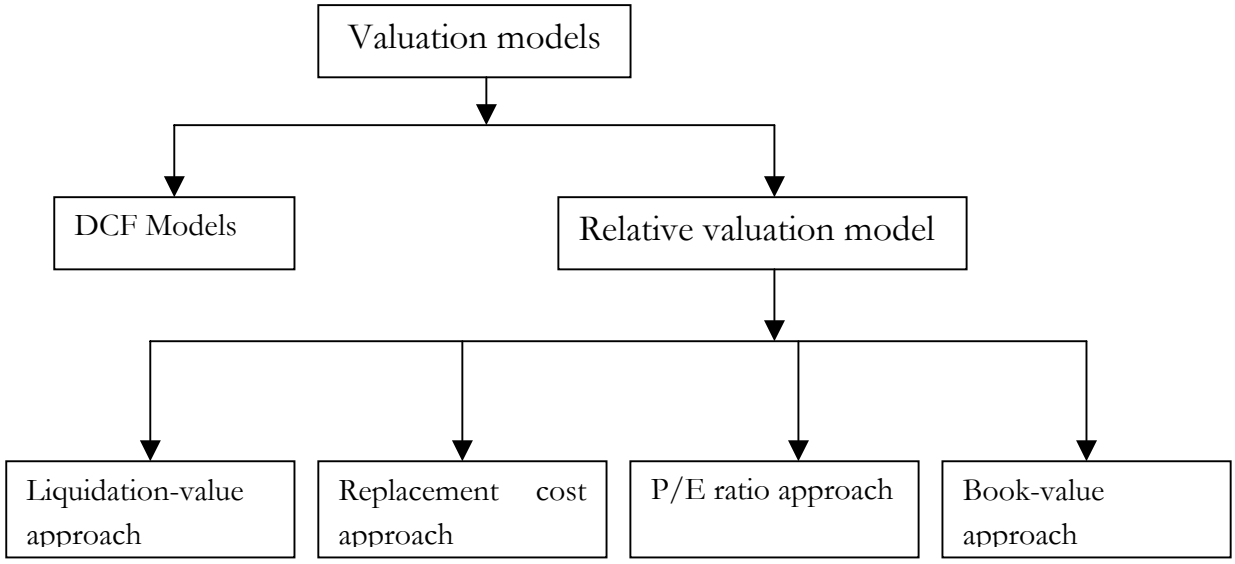
[20] Link, Albert N. (1999) The Art and Science of Business Valuation, Westport, Conn. London : Quorum, p. 18.

[21] Berry Aidan &Jarvis Robin (1997) Accounting in a Business Context, International Thomson Business Press. pp. 34.

3.2 Valuation approaches

There are a wide variety of models for evaluating a company. They are applied in the same context. Here I have classified these valuation methods into discounted cash flow (DCF) models and relative methods as follows:(see figure 3-1)

Figure 3-1 Valuation models



3.2.1 Discounted cash flow method [22]

The theory for any financial investment evaluation is the capital budgeting approach that includes four concepts:

- Free cash flow

  The investor has put money into projects because he expects it to generate cash throughout the lifetime of his investment. We define these as cash flow to the investors. In the following analysis, the cash flow is defined as 'free cash flow'. Free cash flow is a company's true operating cash flow.

[22] Copeland Tom, Koller Tim, Murrin Jack (1990) Valuation: measuring and managing the value of companies, Published by John Wiley &Sons, Inc. p. 217.

Free cash flow is generally not affected by the company's financial structure. Free cash flow is defined to ensure consistency between the cash flow and the discount rate used to value the company. Appendix 3 explains the calculation of free cash flow.

- Time value of money
  One unit of currency is worth more today than it is tomorrow, since there is a cost of capital. This refers to opportunity cost. The sooner they are received, the less they are worth.
- Cost of capital
  - If the cash flow is not risk free, a risk premium will be concerned in the investment. The expected return on an asset should be positively related to its risk. The relationship between expected return on an individual security and Beta of the security could be described as capital-asset-price model (CAPM)
  - $R= R_f+[E(R_m)-R_f]*(beta)$
  - Where R represents expected return on a security
    - R_f represents risk free rate
    - $E(R_m)-R_f$ represents the difference between expected return on market and risk free rate
    - Beta represents the Beta of the security.
  - The CAPM is used to estimate the cost of equity in this thesis.
- Weighted average cost of capital
  - The average cost of capital is a weighting of its cost of equity and its cost of debt
  - $WACC=K_b*(1-T)*(B/V)++K_s(S/V)$
    Where
    K_b = the pretax market expected yield to maturity on debt
    K_S=the market-determined opportunity cost of equity capital
    T = the tax rate
    B =the value of debt
    S= the value of equity
    V=the value of assets

When making a decision in mergers and acquisitions, I used the discounted cash flow (DCF) method. Assuming that the value of a company is equal to the sum of the present value of the various cash flow streams. The ultimate goal is to translate

expectations about the company into financial performance and translate financial performance into values.

3.2.2 Relative approaches

Besides the DCF approach, there are five commonly used relative approaches that exist, liquidation value, replacement cost, price-to-earnings ratio, market-to-book ratio, and book value.

- *The liquidation-value approach* sets the continuing value equal to an estimate of the proceeds from the sales of the assets. Liquidation value is often far different from the value of the company as a going concern. In a growing, profitable industry, a company's liquidation value is probably far below the going-concern value. In a dying industry, liquidation value may exceed going-concern value.
- The *replacement-cost approach* sets the continuing value equal to the expected cost to replace the company's assets. This approach has a number of drawbacks. The most important ones are the following:
    - Only tangible assets are replaceable. The company's 'organizational capital' can be valued only on the basis of the cash flow the company generates. The replacement cost of the company's tangible assets may greatly understate the value of the company.
    - Not all the company's assets will ever be replaced. Consider a machine used only by this particular industry. The replacement cost of the asset may be so high that it is not economic to replace it. Yet, as long as it generates a positive cash flow, the asset is valuable to the ongoing business of the company. Here, the replacement cost may exceed the value of the business as an ongoing entity.
- *The price-to-earnings (P/E) ratio approach* assumes that the company will be worth some multiple of its future earnings in the continuing period. Of course, this will be true; the difficulty arises in trying to estimate an appropriate P/E ratio.

  Suppose the current industry average P/E ratio is chosen. However, prospects at the end of the forecast period are likely to be very different from today's P/E ratio. Therefore, the drawbacks of price-to-earning(P/E) ratio are as follows:
    - It is too affected by transitory events

- It hardly reflects future trends and historical fluctuation.
- It does not include enough financial information such as different leverages used by firms in the same industry.
- It hardly reflects risk differences even when restricted to the same industry's comparison.

- *The market-to-book ratio approach* assumes that the company will be worth some multiple of its book value, often the same as its current multiple or the multiples of comparable companies. This approach is conceptually similar to the P/E approach and therefore faces the same problems. In addition to the complexity of deriving an appropriate multiple, the book value itself is distorted by inflation and the arbitrariness of some accounting assumptions.
- *The book-value approach* assumes that the continuing value equals the book value of the company. Often, the implicit assumption of this approach is that the company will earn a return on capital (measured in terms of book values) exactly equal to its cost of capital. Therefore, the book value should represent the discounted expected future cash flow. Unfortunately, book values are affected by inflation and the choice of accounting rules. Therefore, they do not provide reliable information for these assumptions.[23]

Since the relative approaches have these weaknesses as I state above. Also, McKinsey has tested how well free cash flow explained the market value of 35 US companies. Correlation between market value and free cash flow value is very high. ($R^2 = 0.94$)[24] Thus, I decide to use the discounted cash flow approach in the following evaluation.

3.3 Pro-forma model[25]

A pro forma is a model that predicts company's financial statements, its balance sheets, income statements and cash flow statements. In the following AT&T/McCaw merger case, pro forma model is applied to forecast the free cash flow.

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[23] Ibid,.

[24] McKinsey study, Copeland et al (1990), Anthonsen, martin, Company valuation in the context of takeovers, Göteborg , 1996 pp. 25.

[25] Benninga Simon(1997) Corporate Finance: A valuation approach, New York : McGraw-Hill pp. 109.

Basically, the pro forma is applied to integrate the financial statement into future developing perspectives. That means the accounting tools and techniques are used to ensure accurate financial prediction in the coming years. The pro forma I build to forecast free cash flow in following case is sales-driven pro forma. That means the future cash flow is dependent on sales. The cost and depreciation are related to the sales as well.

3.4 Valuation process

Business valuation is part art and part science. The term 'judgment' may be regarded as 'art'; the term 'systematic' may also be related to 'science'. There are many dimensions of the science in business valuation that are listed as follows:

- General accounting principles and the financial data of the business
- Facts associated with the historical growth of the business
- Extrapolation of financial data into future time periods
- Calculation of various valuation ratios and statistical formulae

There are also many dimensions of the art in business valuation as follows:

- Understanding the economically efficient life of productive assets
- Understanding the economically relevant industry in which the business is valued
- Understanding the appropriateness of one valuation method
- Understanding the limitations of financial information from comparable businesses
- Understanding the economic environment

A business valuation is often dependent on valuator's knowledge, both accounting concepts and economic concepts. Accounting is a systematic way of documenting the business's financial activities, while economics is a systematic way of understanding the market environment in which the business's financial activities take place. Accounting methods are relatively more static in nature than economic methods; there are more systematic practices and principles that guide the application of accounting methods. There is rarely a situation where all aspects of a valuation are accounting related or all aspects are economics related.[26]

[26] Albert N.Link and Michael B.Boger; foreword by james H. Ogburn (1999) The art and science of business valuation. pp. 6-7.

3.4.1 Analyzing the business environment[27]

The process of valuing a company begins with an analysis of its environment; the study of the firm's environment is typically called a 'top-down' process. The objective of the analysis of the firm's environment is to estimate the firm's sales in future years.

Three questions concerned are as follows:

- Are industry sales expected to rise or fall?
- Is the company's market share expected to expand or shrink?
- Are industry prices expected to increase or decrease?

The study of the company's environment begins with a study of the economy. Various industries tend to perform differently in different stages of the economic cycle. For instance, basic industries perform well when the economy gets out of a recession, cosmetic goods sell well in economic downturns and interest-sensitive industries such as banks and insurers do especially poorly when the economy enters a recession. Thus, to the extent that economic activity can be predicted, an understanding of the future course of the economy is useful information in analyzing industries and companies.

After analyzing the macroeconomic conditions, the industry in which the firm operates is analyzed. The objective of the analysis of the industry is to obtain sales projections for the company. Obviously, the industry analysis should incorporate the macroeconomic conditions. Beside the macro-conditions, the current and potential competition in the industry, the relative advantages and disadvantages of the major players have to be considered. Moreover, the relative industry that sells substitute products needs to be considered. These factors could be used to determine the growth in the industry's sales, changes in the company's market share and the growth in the company's sales. [28]

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[27] Simon Z. Benninga, Oded H. Sarig,(1997) corporate finance A valuation approach, The Mcgraw-Hill companies, Inc. pp. 134-135

[28] Simon Z. Benninga, Oded H. Sarig,(1997) corporate finance A valuation approach, The Mcgraw-Hill companies, Inc. pp. 80.

3.4.2 Constructing a model of expected financial performance

After analyzing the corporate environment, the next step is to analyze the company's operating and financial prospects. The pro-forma method, which I present above, is applied to forecast financial statement.

The marketing view of the company is converted into the sales projections and the sales projections are translated into financial performance, which are expressed in the form of pro-forma financial statement. I proceed by converting the marketing view of the firm –the sales projections –into overall projections of financial performance. The way is to use various financial ratios according to its historical accounting statement. The projections of future financial performance should not be confined to an analysis of past relations. Firm and industry change should be incorporated into the projection of future financial performance.

3.4.3 Converting the projected financial performance into value

After using the pro-forma accounting statement, the projected cash flow has been predicted. However, the firm does not cease to exist after the expected periods of cash flow. Therefore, the firm's ability to generate cash flows after the expected period has to be taken into account. This is done by a terminal value as the last cash flow. Discounting the FCFs at the WACC gives us the value of the firm as a whole-the value of the firms' assets. This value equals the sum of the values of all the securities that the firm has issued, such as debt, equity, preferred stock and convertible bonds. In financial terminology this is usually called the value of the firm.

4 Analysis– The AT&T/MCCAW merger[29]

4.1 Analyzing the business environment

4.1.1 Industry perspective

Prior to 1982, the government had allowed AT&T to develop a near monopoly over long-distance services, local-exchange services and telephone-equipment manufacturing. However, in 1982, in order to improve efficiency, encourage competition, and break the monopoly, the U.S. District Court in Washington, D.C. required AT&T to divest itself of the 22 local telephone companies that comprised the Bell System. In return, AT&T was allowed to keep Western Electric and Bell Labs and its long-distance and international business.

As part of the settlement the divested companies were organized into seven regional companies, known as Regional Bell Operating Companies (RBOCs), which served close to 75 per cent of the local telephone exchange lines in the country. The MFJ(Modified Final Judgment) restricted AT&T from entering the local-exchange business and required it to deal with its former affiliates in a nondiscriminatory manner. In addition, the MFJ restricted the RBOCs from entering three lines of business without prior approval from Judge Greene: (1). Long-distance telephone service,(2) manufacturing and (3) information services.[30]

4.1.1.1 Technology introduction

The terms wire line and wirelesses are referring to network facilities owned by a company providing communication services. Wire line, also referred to as a wired, meaning that the communications path between the company's switch and the customer is wired, commonly called the local loop.[31] Traditional phone and data networks such as the Internet were examples of wire networks. Wireless meant that an additional over-the-air component existed in the pathway. Mobile radio

[29] The case is collected from Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523-560

[30] United States v. AT&T Co., 552 F.Supp. 131 (D.C.Cir. 1982), aff'd sub nom., Maryland v. United States, 460 U.S. 1001 (1983)

[31] C. Weinhaus, C. Lagerwerff, R. Lock, et al., Cellular to PCS: A wireless Primer, Telecommunications Industries Analysis Project, University of Florida, December 1995, p. 5.

and cellular phone networks relying on signals transmitted over the air were examples of wireless networks.

There are two kinds of mobile communication technology –analog and digital technology. The former mobile communication systems were analog, where the voice signal varied in a consistent manner. The information is a continuously varying representation of time-the position of the moving hands in relation to the stationary dial. New wireless technology such as data transmission and imaging is digital technology. Digital systems transformed the voice wave into digital form – short bursts of information that represented the height of the voice wave by a number. The digital technology could improve a network's capacity.

4.1.1.2 Wire line market

In 1984 new competition in the long-distance market drove the prices of long-distance service down for the consumer and increasing call volume. By 1992, approximately 90 per cent of revenues in the long distance market were attributable to three independent carriers: AT&T, MCI and Sprint. In that year, the long distance market was projected at $65-$70 billion; AT&T captured a 62 per cent share.[32]

On the local side, the Baby Bells dominated the market. These seven operating companies provided service to over 75 per cent of the estimated 145 million access lines in 1992, with the remainder served by smaller, independent firms. In 1984 these local exchange companies generated operating revenues of approximately $74 billion, but by 1992 revenues had grown to $93 billion. Growth for plain old telephone service (POTS) in the United States was projected to be moderate. Thus, market expansion would be driven by demand for and availability of technologically advanced products and services such as cellular, data transmission and imaging as long as they could be provided at reasonable prices.[33]

4.1.1.3 Wireless market

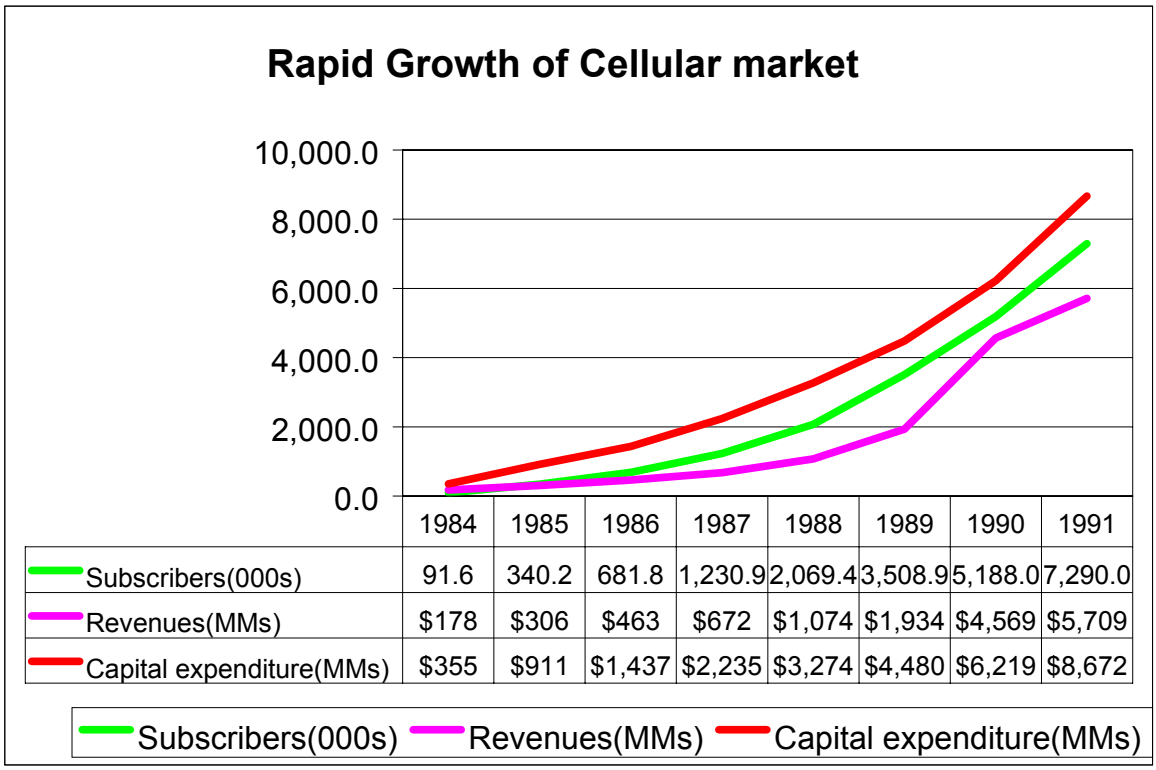
Beginning around 1982, the FCC devised a license-granting scheme that limited the number of licensees to two in each predefined market area. Starting in the mid-80s, McCaw Cellular began systematically to acquire and operate a number of licenses. By 1992, it had become the market leader with 1.2 million subscribers, 60 million POPs and a national penetration rate of 2 per cent. Between 1984 and 1991 the cellular market grew rapidly at a compounded annual growth rate of 86.9

[32] 'Centel Corporation' University of Virginia Darden School Foundation, UVA-F-1078, 1995

[33] Survey of Mobile communications

per cent in subscribers, 64.1 per cent in revenues and 57.9 per cent in capital expenditure. In 1992 the industry had approximately 11 million subscribers and was projected to sign up, on average, almost 10,000 new subscribers per day in 1993.[34] (figure 4-1)

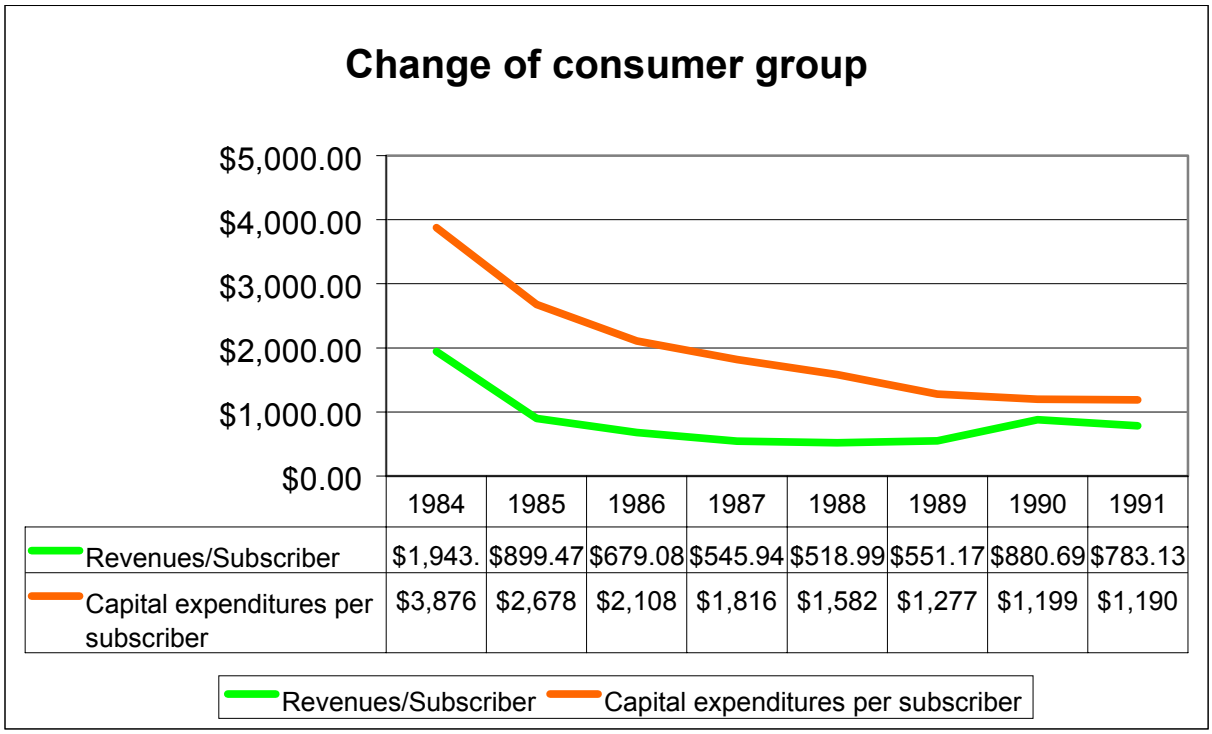
Figure 4-1 Rapid growth of cellular market



	1984	1985	1986	1987	1988	1989	1990	1991
Subscribers(000s)	91.6	340.2	681.8	1,230.9	2,069.4	3,508.9	5,188.0	7,290.0
Revenues(MMs)	$178	$306	$463	$672	$1,074	$1,934	$4,569	$5,709
Capital expenditure(MMs)	$355	$911	$1,437	$2,235	$3,274	$4,480	$6,219	$8,672

[34] 'Survey of mobile communications,' The financial times, September 8,1993, p. XIV.

Figure 4-2 Change of consumer group



.

While the consumer demand of cellular was apparent, the financial success could not be certain. This is due to the fact that U.S. telecommunications technology in 1992 had changed from a high-priced business tool into a low-priced mass-market product. The average revenues per subscriber declined from $1943 to $783.1, the compounded annual rate declined 12.2 per cent. The capital expenditures per subscriber dropped from $3876 to $1190, the compounded annual rate dropped 15.5 per cent (See figure 4-2). In addition, companies offering cellular service continued to be unprofitable because of the huge up-front capital expenditures. The cost of acquiring new subscribers in the early 1990s ran between $500 and $1300 per person and the average monthly bill dropped from over $100 in the late 1980s to about $70 in 1992.[35] Another risk of cellular was whether the radiation levels from portable cellular signals had the strength to permeate healthy human tissues and cause cancer.[36]

[35] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 533.

[36] 'Cellular Firms Grapple with Cancer Scare' USA today, February 1, 1993, p. 1B.

4.1.1.4 Strategic opportunities

It was no secret that the nation's long distance providers wanted somehow to get back into the local telephone business. Cellular technology enabled AT&T to circumvent the Judge Greene's order legally and offer its customers both long distance and local cellular service, bypassing the traditional RBOC wire lines. Communications companies wanted to create broader strategic alliances to capture market growth anticipated by the technological advances and convergence between the computer and telecommunications industries.

Technology was advancing very rapidly by 1992, as voice communications, data and images were being developed to fit together in one portable device. In fact, some analysts anticipated that as digital and data services expanded beyond cellular, the market for these services would grow at 25-30 per cent annually throughout the 1990s, with spending approaching $10 billion by the year 2000. It was estimated that a rival trying to enter the PCS market would pay between $7 billion and $10 billion to obtain the necessary licenses and then spend additional billions to build the network. [37]

4.1.2 Benefit from merger

U.S. population growth rate was steady at approximately 1 per cent annually. McCaw believed that the number of subscribers would grow at about 25 per cent annually from 1993 to 2003. The potential synergies between McCaw and AT&T were extraordinary – for McCaw, cost saving through SG&A consolidation, access to new technology from Bell Labs, vertical integration with AT&T and its switching equipment, increased advertising power, use of the well-recognized AT&T name and the ability to refinance company debt at AT&T's more favorable AA credit rating. AT&T would receive local-access fee reductions and instant access to state-of-the-art technology without directly confronting the RBOCs or having to infuse capital to build an independent cellular network.[38]

[37] 'Craig McCaw's Cautious Grambles', forbes, March 1, 1993, p. 10.

[38] Survey of Mobile communication.

4.2 Analyzing the firms' operations

4.2.1 McCaw Cellular

McCaw Cellular was a Kirkland, Washington-based wireless provider operating in the largest urban areas under the name Cellular One. McCaw had been one of the first to recognize that cellular or wireless, communication technology offered consumers that communications could occur between people instead of between locations. By September 1992, McCaw Cellular employed 4400 people and was the market leader, with 1.2 million subscribers and 58 million POPs in 21 states. Approximately 80 per cent of McCaw's licenses were located in the 30 most populated U.S. areas. In nine years, the company had become not only the largest domestic player in cellular, with 83 per cent of 1991 revenues contributed by cellular service operations, but also a national communications powerhouse. At this subscriber lever, penetration totaled only 2 per cent and would increase between 16 per cent and 24 per cent annually over the next decade[39].

After reading the income statements of McCaw Cellular Communications, Inc. (see appendix 4), I found a strange problem. The net income in 1989, 1991, and 1992 is negative respectively. Besides, compared to AT&T, the profitability ratios are listed as follows:

[39] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 524.

Figure 4-3 Net profit margin

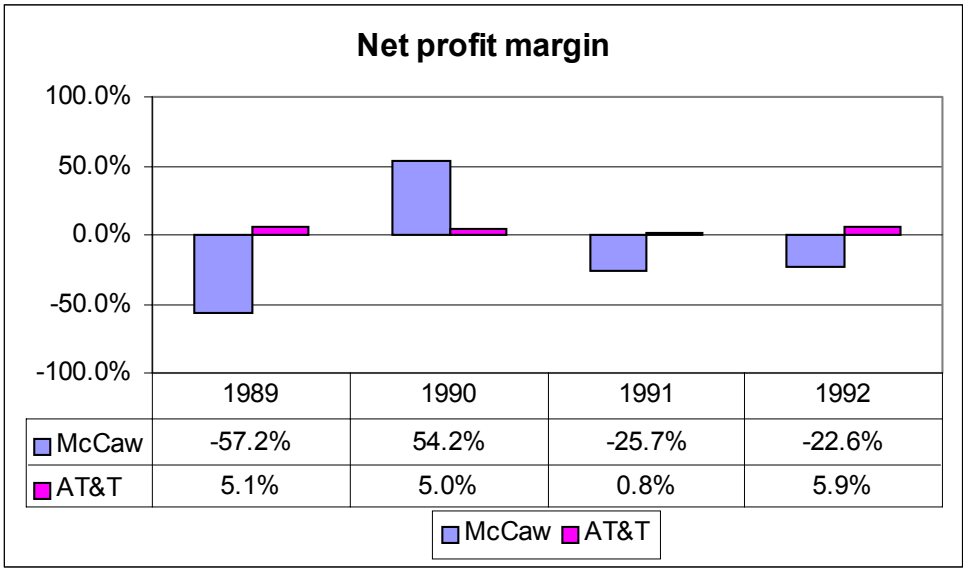


Figure 4-4 Net return on assets

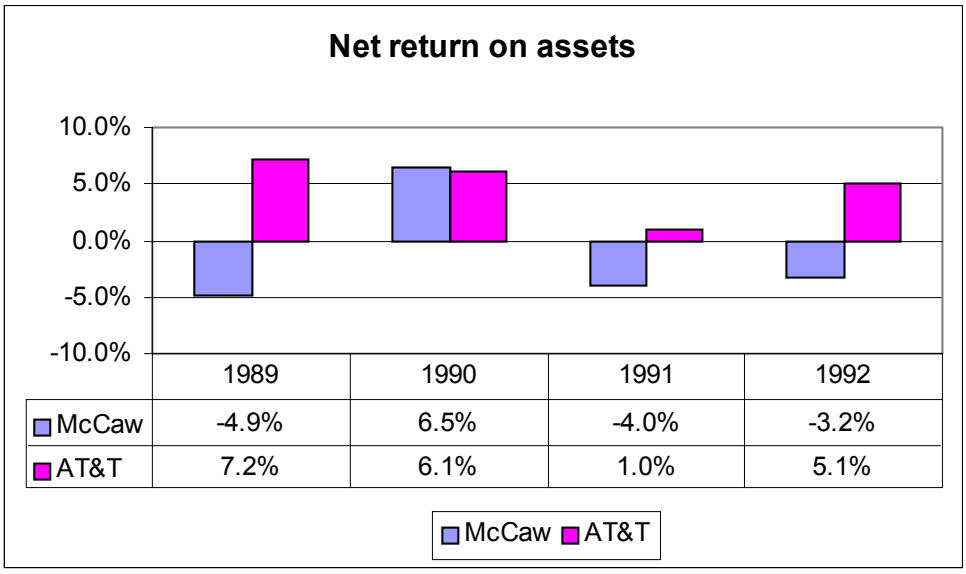
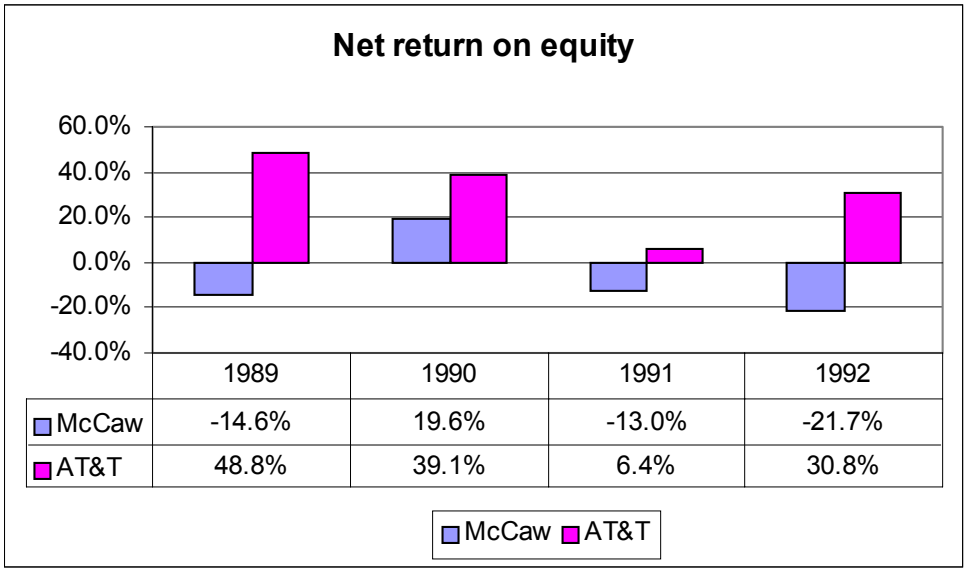


Figure 4-5 Net return on equity



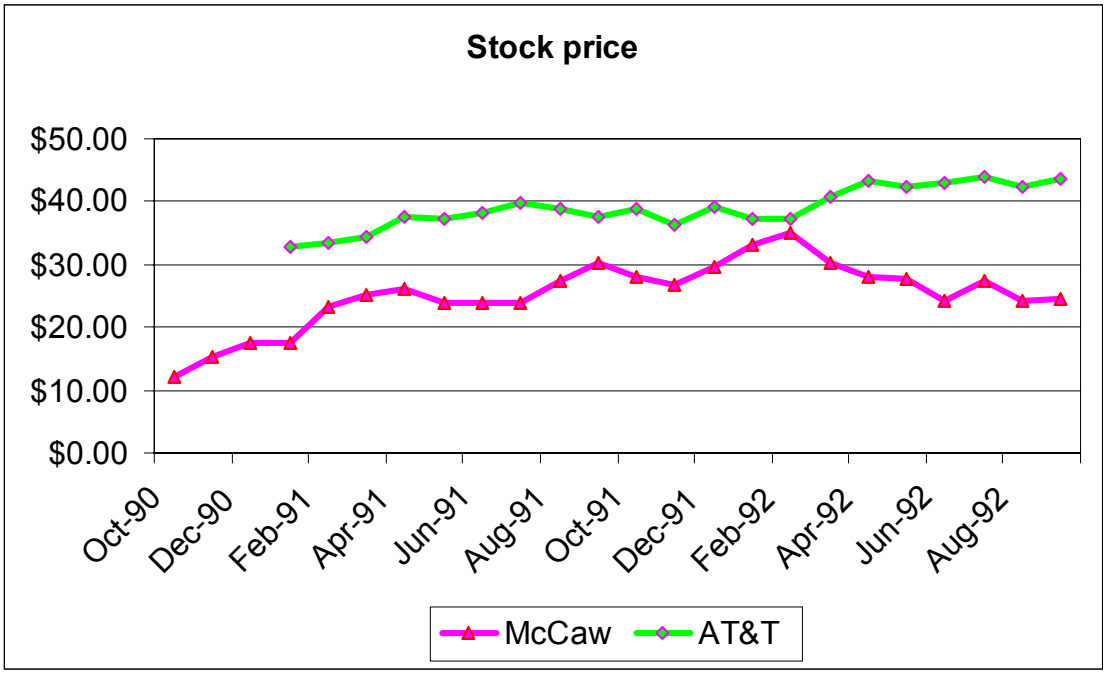
However, after comparing the profitability ratios between McCaw and AT&T, I found the profitability of McCaw to be quite poor. In 1990, the positive net income of McCaw was due to its assets sold, not due to operating better. In 1990, the net gain on assets sold was higher than its total revenues, which means McCaw survived by selling its assets or depending on the expected future profit.

Further analyzing the reason behind the loss, I found the interest expense was very high, average interest expense accounted for 40 per cent of the revenue, which means McCaw had a huge debt burden. (See appendix 4)

Another obvious phenomenon is that the assets of McCaw increased 187 per cent in 1990 and the capital structure changed greatly. The proportion of current assets in the total assets declined from 32.7 per cent to 7.5 per cent. This implied that a significant acquisition activity could happen in 1990, which led to the ability of McCaw to meet recurring financial obligations decreasing dramatically. In addition, at the same time, the net working capital dropped from 773 million to 289 million, deceasing about 62.6 per cent. The current ratio fell from 4.48 to 1.8, which meant the current liabilities rose faster than current assets. This could be the first sign of financial trouble. Furthermore, the growth rate of debt was respectively 3 per cent, 4 per cent in 1991,1992 respectively. Compared to growth rate of equity , respectively -6 per cent, -7 per cent. The ratio of debts to assets increased 1 per cent every year from 1990 to 1992. In a word, despite having a high growth market, splendid prospects, McCaw's current financial situation was not optimistic. It also faced a soaring risk of financial distress, due to its high

increase of debts, high amount of burden of debt interests and poor profitability. (See appendix 4 and appendix 5)

Figure 4-6 Stock price



Compared to the stock price between McCaw and AT&T, the stock price of McCaw rose sharply from Oct. 1990. However, after Feb. 1992, it declined dramatically, compared to increasing price of AT&T. I deduce that it is due to the poor profitability.

LIN Broadcasting was a large New York—based communications firm. It owned television properties (seven station, five in top-10 markets) and cellular licenses in the lucrative markets of New York, Los Angeles, Philadelphia, Houston and Dallas.

Craig McCaw was interested in LIN for two reasons: (1) its New York and Los Angeles penetration, two markets McCaw had been unable to enter, and (2) its low service price in the markets than its competitors. Therefore, McCaw moved to acquired LIN in 1989. In November, after months of bidding against BellSouth, McCaw in a hostile takeover, successfully bid $3.4 billion or $154.11 per share, for 52 per cent of LIN broadcasting and control. A final condition of the deal was

that McCaw Cellular had to purchase the remaining 48 per cent of LIN by October 1995 or divest itself of its current 52 per cent ownership. [40]

4.2.2 American Telephone &Telegraph (AT&T)[41]

One consequence of deregulation in 1984 was that AT&T now had to pay each RBOC an access fee for use of the local network at the end of a long-distance connection.

The increasingly global nature of the telecommunications business enabled Allen, the new CEO, and his management team to view AT&T not as the largest long-distance provider in the nation, but rather as a communications concern. AT&T had faced almost unprecedented business challenges in going forward since the divestiture of its local telephone companies in 1984. It has to minimize the loss of its historic business and seek to invest in new information technology and transform AT&T into a global communications giant. Since 1988, Allen has engineered a series of acquisitions aimed at realizing his vision. He assembled a number of computer, software, multimedia and other key technology interests. Each acquisition was a deliberate attempt to supplement AT&T's existing network with the tools to achieve communications anywhere and at any time.

Allen's efforts had some progress. Despite a decline in the market share of its core long-distance business from 97 per cent to 65 per cent, AT&T had been more profitable in the later 1980s. Operating income as a percentage of revenue had grown from approximately 5 per cent in 1984 to nearly 9 per cent in 1990. Earnings per common share before extraordinary items and cumulative effects of accounting changes rose from $1.14 to $2.38 over the same period.[42]

Compared to the financial statement of McCaw, AT&T had a strong profitability and fine financial situations. (See figure 4-3, figure 4-4, and figure 4-5). The net profit margin was around 5 per cent, the net return on assets was around 6 per cent, the net return on equity was around 40 per cent between 1989 and 1992. The growth rate of revenue was respectively 1.44 per cent, 0.18 per cent in 1991, 1992 respectively, compared to the growth rate of expense –0.15 per cent,-0.29 per cent at the same period. The growth rate of debt and equity were at the similar pace,

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[40] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 537.

[41] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 527.

[42] S.L. Mintz, 'Can AT&T stay on Top?' CFO: The magazine for senior financial executive 10 (April 1994), p. 4.

even the leverage ratio declined in 1992. However, I found strange phenomena that the profitability in 1991 was dramatically lower than the other years. If seeking the causes, I found the provision for business restructuring was quite high in 1991. One possible action that could bring about such a provision was that in 1991 AT&T merged with NCR. AT&T spent extra expenses in restructuring. Thus, I draw a conclusion that acquiring firms could create a huge financial burden and a risk that lowers its profitability.

4.3 Estimating the cost of capital [43]

4.3.1 Estimating the cost of equity

The CAPM assumes that the opportunity cost of equity is equal to the return on risk-free securities plus the company's systematic risk (beta) multiplied by the market price of risk (market risk premium). The equation for the cost of equity K_s is as follows:

$$K_s = R_f + [E(R_m) - R_f] * (\text{beta})$$

Where

R_f = the risk-free rate of return

$E(R_m)$= the expected rate of return on the market portfolio

$E(R_m)-R_f$ =the market risk premium

Beta = the systematic risk of the equity

In the AT&T/McCaw merger case, according to the information calculated using monthly stock prices over the past five years, the Beta was 1.75[44]. the 1-year treasure bill at the end of September in 1992 was 3.16.[45] The market risk premium (the price of risk) is the difference between the expected rate of return on the market portfolio and risk-free rate, $E(R_m)-R_f$. Normally, a 5 to 6 per cent market risk premium for U.S. companies is used. This is based on the long-run geometric average risk premium for the return on the S&P 500 versus the return on long-

[43] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 523-560

[44] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 552.

[45] Ibid, pp. 556.

term government bonds from 1926 to 1998. [46] Thus the cost of equity of McCaw is calculated as follows:

$K_s = R_f + [E(R_m) - R_f] * (beta)$

$K_s = 3.16\% + 6\% * 1.75 = 13.66\%$

4.3.2 Estimating the WACC

Both creditors and shareholders expect to be compensated for the opportunity cost of investing their funds. The weighted average cost of capital (WACC) is the discount rate or time value of money, used to convert expected future cash flow into present value for all investors.

The most important general principle to recognize when developing a WACC is that it must be consistent with the overall valuation approach and with definition of the cash flow to be discounted. To be consistent with the free cash flow approach, the estimate of the cost of capital must comprise a weighted average of the costs of all sources of capital –long term debt, short term debt, equity and so on –since the free cash flow represents cash available to all providers of capital.

This must be computed after corporate taxes, since the free cash flow is stated after taxes.

The general formula for estimating the after-tax WACC is as follows:

$WACC = K_b * (1-T) * (B/V) + K_L * (1-T) * (L/V) + K_s (S/V)$

Where

K_b = the pretax market expected yield to maturity on short-term debt

K_L = the pretax market expected yield to maturity on long-term debt

K_S =the market-determined opportunity cost of equity capital

T = the tax rate

B =the value of short-term debt

L =the value of long-term debt

S= the value of equity

V= the value of assets

According to the balance sheet of McCaw in September of 1992, the liabilities and equities are listed as follows:

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[46] Copeland, Thomas. E (1990) Valuation: measuring and managing the value of companies, New York Wiley. Cop pp. 193.

Table 4-1 Proportion of debt and equity [47]

	Balance sheet (thousands)	Proportion (%)
Short-term debts	487282	5
Long-term debts	5694785	65
Equities	2599481	30

Table 4-2 Current capital market conditions[48]

Short-term debt rates	6.25 %
Long-term debt rate	12.03 %
Tax rate	36 %

According to the WACC formula

$WACC=K_b*(1-T)*(B/V)+K_L*(1-T)*(L/V)+K_s(S/V)$

$WACC=6.25*(1-0.36)*5\%+12.03*(1-0.36)*65\%+13.66*30\%$

$WACC=9.26$

4.4 Expected financial performance

4.4.1 Overview

Since the objective of expected financial performance is to forecast the future cash flow, I have divided the forecast process into three stages:

- Forecasting annual revenue of cellular market (See appendix 12)
- Forecasting annual revenue of McCaw (See appendix 13)
- Forecasting the future free cash flow of McCaw (See appendix 3)

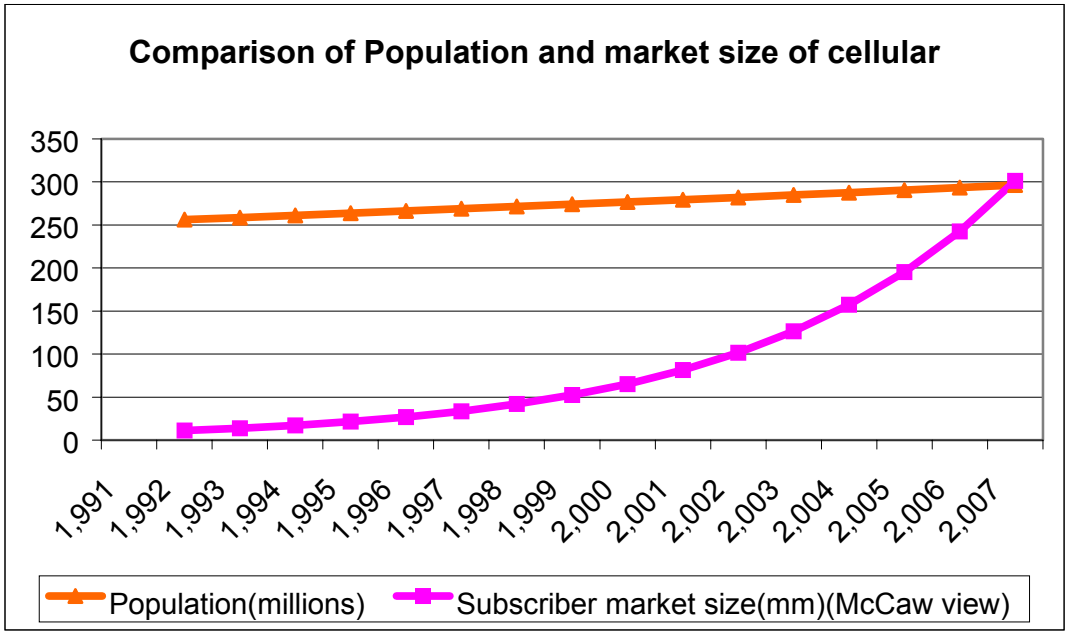
I have separated the forecast period into two stages, before 2006 and after 2006. The population is assumed to increase 1 per cent per year, the market size of cellular was increasing 24.7 per cent which was significantly higher than population growth. Thus in 2007, the market size of cellular will exceed the

[47] Calculated from appendix 6

[48] Bruner, Robert F, Boston (1999)'case studies in finance: managing for corporate value creation': Irwin/Mcbraw-Hill. pp. 556.

population. The market will enter the mature period and revenues will not increase as fast as before. Actually, when the penetration is close to 100 per cent, the growth rate of revenues will be convergence. Thus, the forecast of McCaw's cash flow can be separated into two time periods: present value of cash flow before 2006 and present value after 2006, which means continuing value. (See figure 4-7)

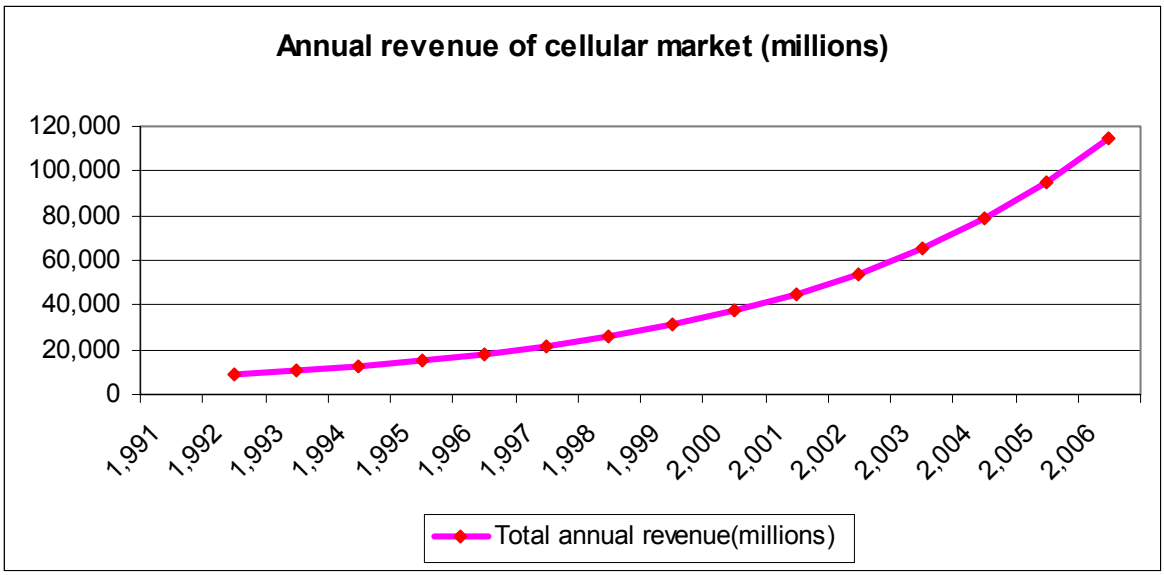
Figure 4-7 Comparison of population and market size of cellular



4.4.2 Forecasting revenue of cellular market

In appendix 12, I have described the process for forecasting cellular market revenue. As shown in appendix12, the annual revenue of the cellular market is determined by the subscribers and average revenue per subscriber. The subscribers are related to the population and penetration. Here I use weighted average revenue per subscriber to guess the average revenue in the future. The variables and assumptions are introduced in appendix 1. The results are shown in appendix 10 and figure 4-8.

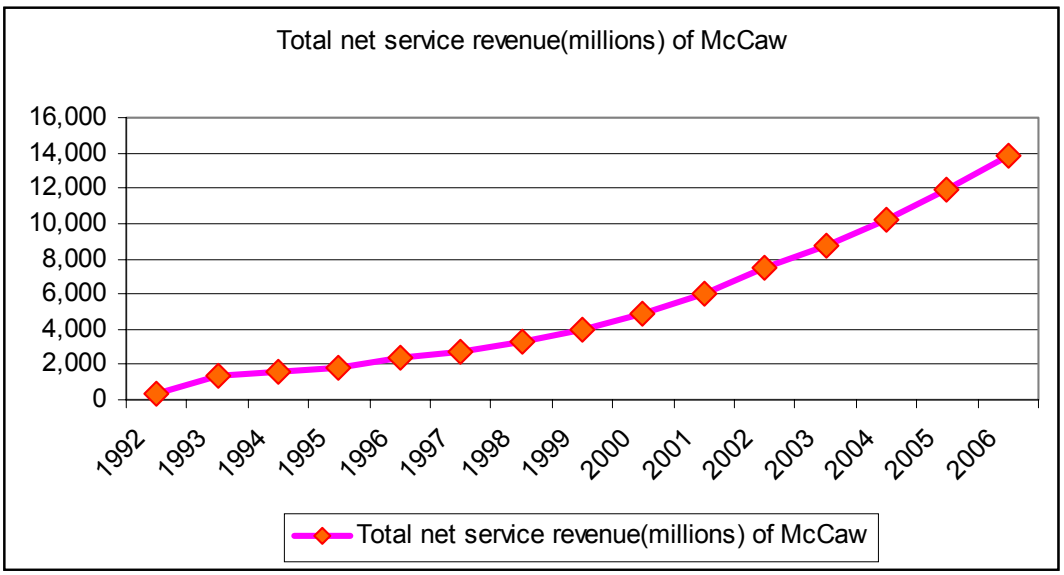
Figure 4-8 Annual revenue of cellular market



4.4.3 Forecasting the annual revenue of McCaw

In appendix 13, I have introduced the process to forecast the annual revenue of McCaw. According to the assumption from the case, the LIN company was purchased in 1995. The variables are illustrated in appendix 2. The results are shown in appendix 11 and figure 4-9.

Figure 4-9 Net service revenue of McCaw

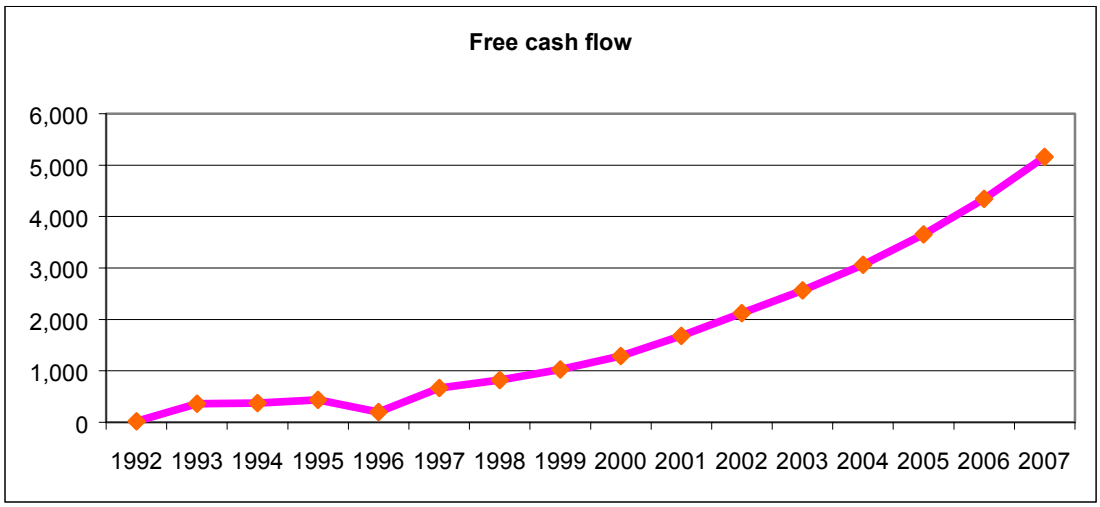


4.4.4 Forecasting free cash flow

After forecasting the annual revenues of the cellular market, the next step is to predict the free cash flow of McCaw. Free cash flow is a company's true operating

cash flow generated by the company that is available to all providers of the company's capital, both creditors and shareholders. The definition of free cash flow is shown in appendix 3. The variables and assumptions to calculate free cash flow are explained in appendix 2. The calculation process is illustrated in appendix 13. The results are shown in appendix 11 and figure 4-10. As shown in figure 4-10, in 1996, the free cash flow would turn down, because in 1995, McCaw would have to purchase the remaining share of LIN. That would cause a rapid increase in subscribers in 1996, which consumed huge capital expenditures.

Figure 4-10 Forecasting free cash flow of McCaw



4.5 Converting the financial performance into value

The value of operations equals the discounted value of expected future free cash flow. Free cash flow is equal to the after-tax operating income of the company less investments in working capital, property, plant and equipment and other assets.
An additional problem in valuing a company is its indefinite life. In this case, I separate the value of McCaw into two time periods, during and after an explicit forecast period.

Value1	Value 2
Present value of cash flow during explicit forecast period	Present value of cash flow period after explicit forecast period

Value=value1+value2

$$Value1 = PV = \frac{\sum_{t=1}^{n} FCF_t}{(1+WACC)^t}$$

where n= Explicit forecast period

FCF_t=Expected free cash flow in period t

WACC= weighted average cost of capital

In this case, the present value =8,521 million (see appendix 14)

The value after the explicit forecast period refers to the continuing value. Simple formulas can be used to estimate the continuing value without the need to forecast the company's cash flow in detail for an indefinite period. One approach estimates the continuing value using the following formula:

$$Value2 = CV = \frac{FCF_{t+1}}{WACC - g}$$

Since in 2007, the subscribers will exceed the population, the growth rate of free cash flow can not possibly fluctuate around 20 percent. Here, I assume that it is 5 per cent. Thus, the continuing value is calculated as follows:

$$Value2 = CV = \frac{FCF_{t+1}}{WACC - g} = \frac{1251}{9.26\% - 5\%} = 29374 \text{ (million)}$$

The value of McCaw =PV+CV=8521+29374=37895 (million)

If the leverage keep the same ratio (Debt/equity=0.7) , the value of equity is equal to 11338.5 million and the value of debt is 26556.5 million.

5 Conclusion

In the evaluating the McCaw company process, some conclusions can be drawn as follows:

The stock transaction of McCaw valued at approximately $12.6 billion [49]. However AT&T completed this acquisition at $11.5 billion[50] I apply free cash flow to evaluate McCaw and deduce its equity at $11.3 billion. What is the 'precise' price for AT&T to acquire the McCaw Company? I re-evaluated to explore the factors that affect the value of McCaw.

Here, $12.6 billion is market value of common equity for McCaw. It is sensitive to the fluctuation of stock market. $11.5 billion is the bid price, which can be called the fair market value between AT&T and McCaw. $11.3 is the economic value of the expected earning. The economic value of McCaw is depended on it future free cash flow .The historical net income has no effect on it future cash flow. On the contrary, McCaw's potential profitability and its business environment such as the change in technology, growth rate of market size (subscribers), and market share of McCaw are the determinants for McCaw's economic value.

Besides, FCF valuation is very time consuming if it is properly performed. I spent two months gathering information and doing spreadsheets. The forecast period spans from 1992 to 2006. Thus, one advantage of this method is that the time can correct its valuation mistakes and revert into its "true" value.

[49] http://www.att.com/press/0893/930816.cha.html

[50] http://www.attwireless.com/press/releases/2001_07/070901_split.html

6 Appendix

Appendix 1 Variables of McCaw's Cellular Industry Projections

	Variables	Definition	Assumption or relationships of variables
(1)	Population (million)	Population in United State	The population growth 1 per cent per year
(2)	% Coverage	Percentage of subscribers to total the population	97 per cent of population will be potential subscribers
(3)	Net POPs covered (million)	POPs represented potential subscribes for cellular	(3)=(1)*(2)
(4)	% Penetration year-end (McCaw view)	Percentage of subscribers accounted for potential subscribers	According to McCaw's view, [51]
(5)	Annual penetration gain	Increase of penetration	$(5)=(4)_t-(4)_{(t-1)}$
(6)	Subscriber market size	The increase of subscribes per year	(6)=(3)*(4)
(7)	Annual growth	Subscriber growth rate	According to McCaw view,
(8)	Average subscribers	Average increase of subscribers per year	$(8)=[(6)_t+(6)_{(t-1)}]/2$
(9)	Churn rate	Percentage of subscribers that cancel their service	According to McCaw view,
(10)	High-use of local subscribers	Percentage of high revenues subscribers	According to McCaw view,
(11)	Mid-range % of local subscribers	Percentage of middle revenues subscribers	According to McCaw view,
(12)	Low-use/PCS % local subscribers	Percentage of low revenues subscribers	According to McCaw view,

[51] Bruner F. Robert(1999)Case studies in Finance managing for corporate value creation, Irwin McGraw-Hill, p. 550

Appendix 1 (continue) Variables of McCaw's Cellular Industry Projections

	Variables	**Definition**	**Assumption or relationships of variables**
(13)	High-use local revenue /subscribers	Average revenues of per high-user	According to McCaw view, [52]
(14)	Middle-range local revenue /subscribers	Average revenues of per middle-range user	According to McCaw view,
(15)	Low-use/PCS local revenue /subscribers	Average revenues of per low-user	According to McCaw view,
(16)	Combined local revenue/Subscribers per month	Combined local revenue/Subscribers per month	(16)=(10)*(13)+(11)*(14)+(12)*(15)
(17)	Combined local annual revenue/Subscribers	Combined local annual revenue/Subscribers	(17)=(16)*12
(18)	Roaming revenue/Subscribers per month	Roaming revenue/Subscribers per month	According to McCaw view,
(19)	Combined roaming annual revenue/Subscribers	Roaming annual revenue/Subscribers	(19)=(18)*12
(20)	Total roaming revenue	Total roaming revenue	(20)=(8)*(19)
(21)	Total revenue/Average subscribers per month	Total revenue/Average subscribers per month	(21)=(20)+(18)
(22)	Total annual revenue	Total annual revenue	(22)=(21)*12

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[52] Bruner F. Robert(1999)Case studies in Finance managing for corporate value creation, Irwin McGraw-Hill, p. 550

Appendix 2 Variables Financial Forecast of McCaw Cellular

	Variables	Definition	Assumption or relationships of variables
(1)	Annual population growth rate	Annual population growth rate	The population growth 1 per cent per year
(2)	Annual penetration growth	Increase percentage of subscribers accounted for potential subscribers	Average 23.5 %
(3)	Purchase remainder of LIN	Purchase remainder of LIN	Take place in 1995

	Variables	Definition	Assumption or relationships of variables
(4)	Direct costs and expenses (except marketing)(% service revenues)	Percentage of direct costs and expenses (except marketing) accounted for service revenues	According to McCaw view, [53] decrease 1.70% per year
(5)	Direct cost increment (%)	Growth rate of direct cost	-1.70%
(6)	Marketing expenses (% service rev.)	Percentage of marketing expenses accounted for service revenues	According to McCaw view, decrease 8 % per year
(7)	Marketing expense increment (%)	Growth rate of marketing cost	-8%
(8)	Depreciation plus amortization (% service rev.)	Average increase of subscribers per year	According to McCaw view, decrease 5% per year
(9)	D&A increment (%)	Growth rate of D&A increment	-5%

[53] Bruner F. Robert(1999)Case studies in Finance managing for corporate value creation, Irwin McGraw-Hill, p. 550

Appendix 2 (continue) Variables Financial Forecast of McCaw Cellular

	Variables	Definition	Assumption or relationships of variables
(10)	Capital expenditures per net subscriber addition	Capital expenditures per net subscriber addition	According to McCaw view,
(11)	Net working capital (NWC) per subscriber	Capital expenditures per net subscriber addition	According to McCaw view,
(12)	Tax rate	Tax rate	36%

	Variables	Definition	Assumption or relationships of variables
(13)	McCaw Pops	McCaw potential subscribers	According to McCaw's view, [54]
(14)	McCaw penetration	Percentage of subscribers accounted for POPs	Growth rate 23.5%, see (2)
(15)	McCaw subscribers	McCaw subscribers	(15)=(13)*(14)
(16)	LIN POPs	LIN potential subscribers	According to McCaw's view
(17)	LIN penetration	Percentage of subscribers accounted for POPs	Growth rate 23.5%, see (2)
(18)	LIN subscribers	LIN subscribers	(18)=(16)*(17)
(19)	McCaw share of LIN subscribers	The subscribers of LIN transfer into McCaw	After 1995, Total subscribers of LIN transfer into McCaw
(20)	McCaw share of LIN POPs	The POPs of LIN transfer into McCaw	After 1995, Total POPs of LIN transfer into McCaw

[54] Bruner F. Robert(1999)Case studies in Finance managing for corporate value creation,Irwin McGraw-Hill, p. 550

Appendix 2 (continue) Variables Financial Forecast of McCaw Cellular

	Variables	**Definition**	**Assumption or relationships of variables**
(21)	Proportionate McCaw POPs	Total POPs of McCaw	(21)=(13)+(20)
(22)	Proportionate McCaw subscribers	Total subscribers of McCaw	
(23)	Beginning subscribers	Total subscribers of McCaw in the beginning of this year	$(23)_t=(15)_{t-1}+(19)_{t-1}$
(24)	Subscribers added	Total annual revenue	$(24)_{t-1}=(23)_t-(23)_{t-1}$
(25)	Ending subscribers	Total subscribers of McCaw in the end of this year	(25)=(23)+(24)
(26)	Period average subscribers	Period average subscribers	(26)=[(23)+(25)]/2
(27)	Avg. net rev./sub per month	Average revenues per subscriber per month	Taken from table 5-1's (19)
(28)	Total net service revenue	Total net service revenue	(28)=(26)*(27)*12
(29)	% Growth net service revenues	Growth rate of service revenues	$(29)=(28)_t/(28)_{t-1}-1$
(30)	Direct costs and expenses (except marketing)	Direct costs and expenses (except marketing)	(31)=(28)*(4)
(31)	Marketing	Marketing expenses	(31)=(28)*(6)
(32)	Operating cash flow	Operating cash flow	(32)=(28)-(30)-(31)
(33)	Depreciation and amortization	Depreciation and amortization	(33)=(28)*(8)
(34)	Cellular operating income	Total annual revenue	(34)=(32)-(33)
(35)	After-tax cellular operating income	After-tax cellular operating income	(35)=(34)*(1-tax)

Appendix 2 (continue) Variables Financial Forecast of McCaw Cellular

	Variables	**Definition**	**Assumption or relationships of variables**
(36)	Depreciation and amortization	Depreciation and amortization	(36)=(33)
(37)	CapEx	Capital expenses	(37)=(10)*(24)
(38)	ΔNWC	Changes in working capital	$(38)=(11)_t*(26)_t-(11)_{t-1}*(26)_{t-1}$
(39)	Free cash flow	Free cash flow	(37)=(35)-(36)+(37)-(38)
(37)	CapEx	Capital expenses	(37)=(10)*(24)

Appendix 3 Free cash flow

Operation	**Free cash flow**
	Annual revenues
(−)	Direct costs and expenses (except marketing)
(−)	Marketing
(=)	Operating cash flow
(−)	Depreciation and amortization
(=)	Operating income
(− 36% tax)	After-tax operation income
(+)	Depreciation and amortization
(−)	Capital expenses
(−)	ΔNet working capital
(=)	**Free cash free**

Appendix 4. Historical income statements McCaw Cellular Communications, Ins. (in millions, except where noted)

Year	1989	1990	1991	Sep.30, 1992
Revenues:				
Cellular	$446,503	$830,497	$1,135,240	
Broadcast		$116,820	$129,481	
RCC and other	$57,635	$90,136	$100,850	
Net revenues	$504,138	$1,037,453	$1,365,571	$1,249,102
Expenses				
Operating	$437,745	$715,288	$888,419	$767,679
Corporate	$14,254	$20,860	$16,514	$15,522
Depreciation	$65,059	$103,288	$143,231	$129,928
Amortization of intangibles	$127,312	$149,637	$201,376	$154,767
Subtotal	$644,370	$989,073	$1,249,540	$1,067,896
Operating income(loss)	($140,232)	$48,380	$116,031	$181,206
Other income:				
Interest expenses	($245,523)	($496,602)	($577,992)	($377,955)
Interest income	$54,097	$45,612	$30,072	$13,979
Net gain on assets sold	$28,204	$1,172,896	$249,479	$2,589
Equity in income of unconsolidated investors	$6,885	$16,752	$22,874	$38,258
Nonrecurring benefit (charge)		($16,621)	$6,241	
Subtotal	($156,337)	$722,037	($269,326)	($323,129)
Profit before tax	($296,569)	$770,417	($153,295)	($141,923)
Tax	$760	$314,505	$49,486	$23,062
Profit after tax	($297,329)	$455,912	($202,781)	($164,985)
Minority interest				
(Income)loss of consolidated subsidiaries	$8,790	($32,165)	($14,000)	($16,439)
Provision of pref. stock dividend to subsidiaries		($52,348)	($134,300)	($100,725)
Income tax benefit of prior year's losses		$190,919		
Net income	($288,539)	$562,318	($351,081)	($282,149)
Weighted avg. number of shares outstanding	$148,157,863	$182,414,174	$181,487,060	$182,499,000
Proportionate subscribers	$434,000	$687,000	$985,000	$1,252,000
Proportionate POPs	$52,066,000	$55,900,000	$57,400,000	$58,500,000

Sources: McCaw Cellular Communications 1991 annual report; 1992 SEC 10-Q Filings

Appendix 5. Historical income statement (AT&T) (all figures in millions)

	12/31/89	12/31/90	12/31/91	9/30/92
Revenues				
Telecommunications services	38,475	38,263	38,805	29,856
Sales of products and systems	15,241	16,124	15,941	11,167
Rentals and other services	6,956	6,993	6,959	5,060
Financial services and leasing	$428	$811	$1,384	$1,317
Net Revenues	61,100	62,191	63,089	47,400
Costs				
Telecommunications services	26,045	25,633	25,276	19,050
Products and systems	8,849	9,228	9,134	6,665
Rentals and other services	3,596	3,377	3,344	2,379
Financial services and leasing	244	645	1,071	940
Subtotal	38,734	38,883	38,825	29,034
Gross margin	22,366	23,308	24,264	18,366
Operating expense				
SG&A	14,244	14,782	16,220	11,574
R&D	3,098	2,935	3,114	2,204
Provision for business restructuring		95	3,572	39
Subtotal	17,342	17,812	22,906	13,817
Operating income (loss)	5,024	5,496	1,358	4,549
Other income (net)	427	257	251	344
Interest expense	(720)	(874)	(726)	(500)
Profit before tax	4,731	4,879	883	4,393
Taxes	(1,622)	(1,775)	(361)	(1,586)
Profit after tax	3,109	3,104	522	2,807
Net income	3,109	3,104	522	2,807
Weighted-average number of shares outstanding	1,294	1,282	1,293	1,329
Capital expenditures	3,959	4,120	4,086	1,057
Earnings per share	$2.40	$2.42	$0.40	$2.11
Dividends per common share	$1.20	$1.32	$1.32	$0.99

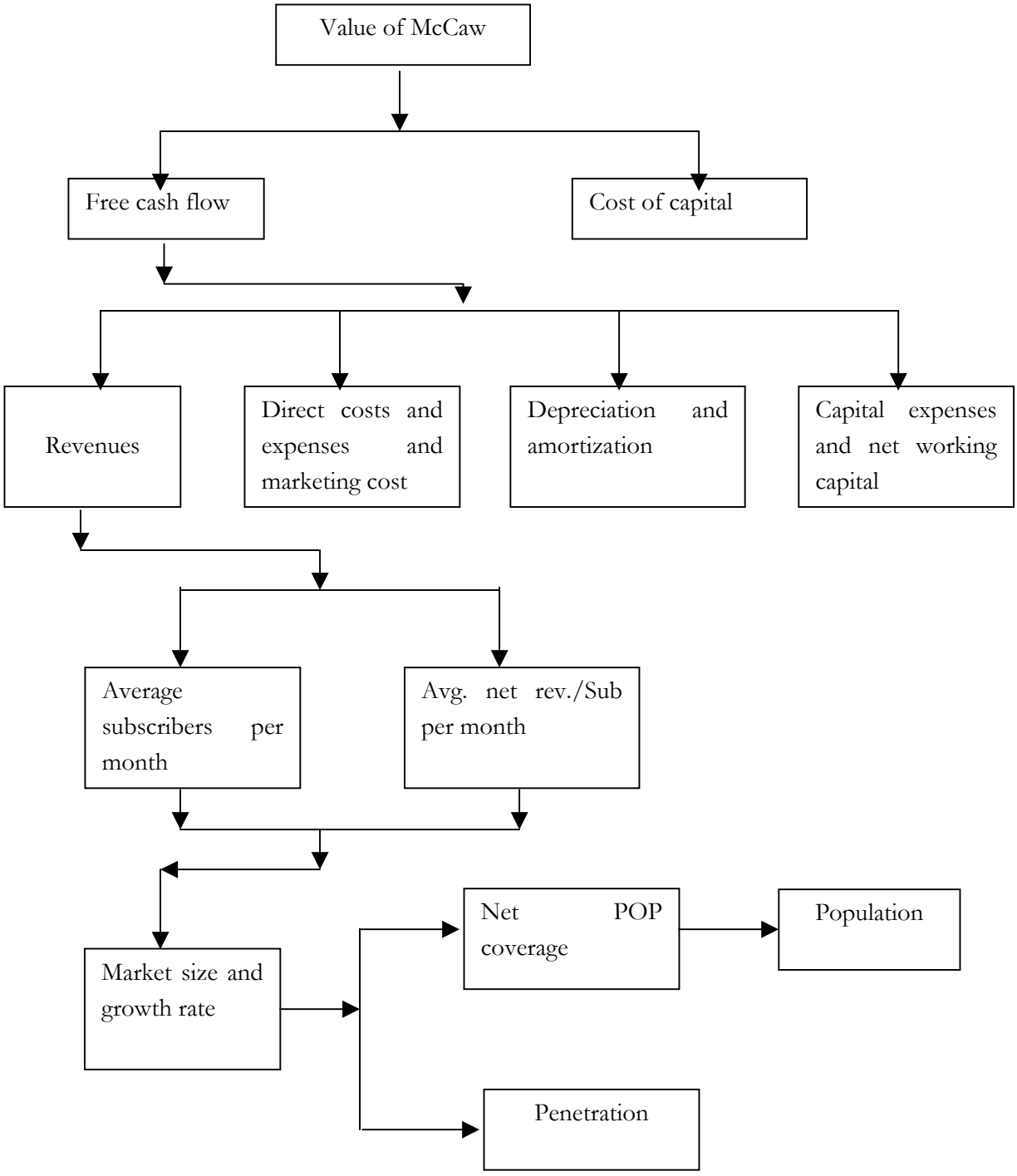
Sources: AT&T 1991, 1992 annual reports and SEC 10-Q filings.

Appendix 6. Historical balance sheet information McCaw Cellular Communications, Inc. (in thousands)

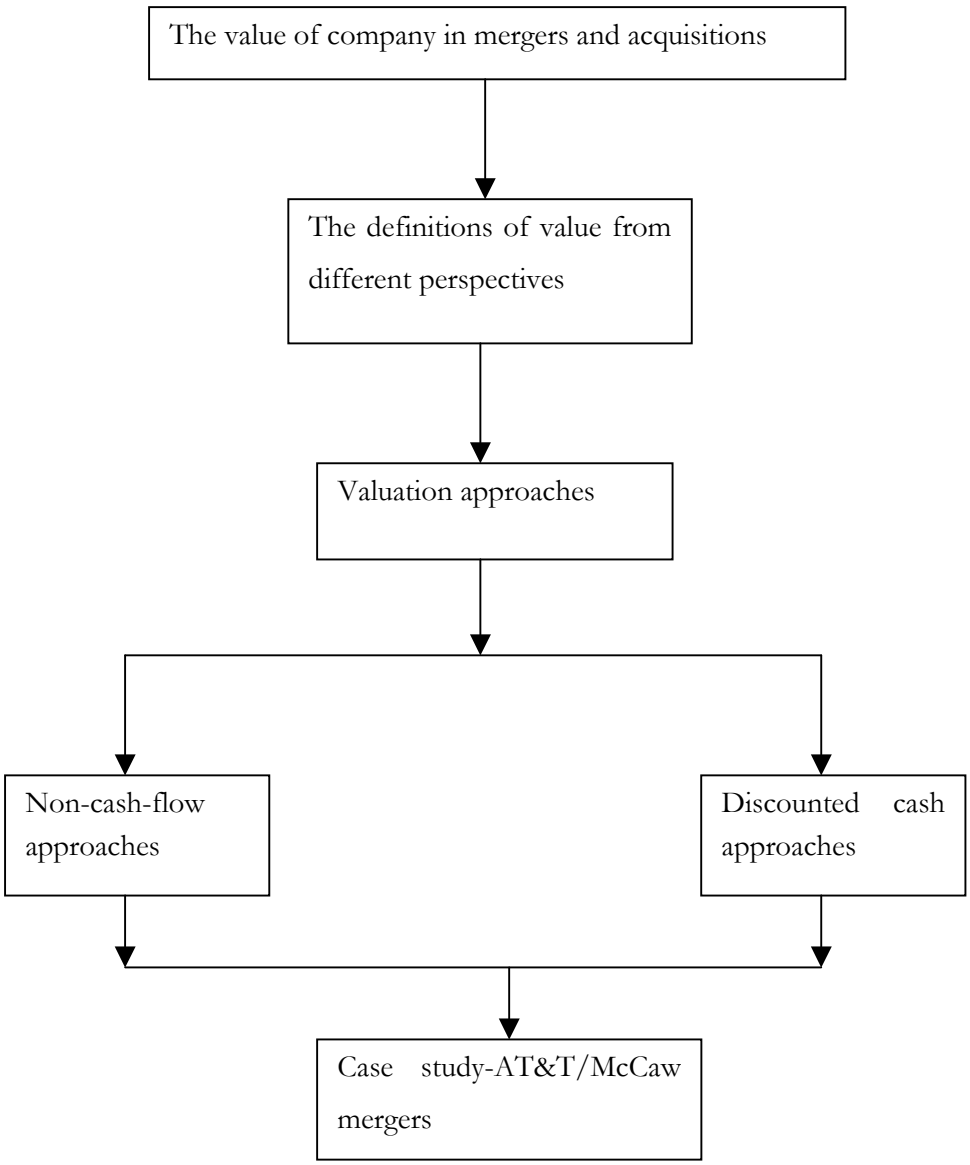
	12/31/89	12/31/90	12/31/91	9/30/92
Current assets				
Cash and cash equivalents	$461,806	$345,309	$138,184	$161,982
Marketable securities	$435,847	$65,691	$258,243	$153,276
Accounts receivable, net	$63,835	$155,250	$202,196	$241,268
Federal tax benefit receivable		$47,825		
other	$34,185	$36,855	$39,103	$50,651
Total current assets	$995,673	$650,930	$637,726	$607,177
PPE, net	$630,264	$874,725	$1,196,482	$1,328,240
Licensing costs	$789,211	$4,403,825	$3,996,628	$4,783,390
Other intangibles	$139,392	$687,237	$823,441	
Investments	$358,326	$1,855,407	$1,861,016	$1,876,336
Other	$128,478	$242,041	$201,403	$186,405
Subtotal	$2,045,671	$8,063,235	$8,078,970	$8,174,371
Total assets	$3,041,344	$8,714,165	$8,716,696	$8,781,548
Current liabilities				
Current portion of long-term debt	$13,422	$37,452	$48,117	$68,199
Accounts payable	$194,197	$82,312	$107,859	$69,459
Accrued expenses		$210,083	$290,669	$294,824
Unearned revenues/customer deposits	$14,637	$32,113	$44,324	$54,800
Total current liabilities	$222,256	$361,960	$490,969	$487,282
Long term debt	$1,738,896	$5,224,777	$5,198,838	$5,526,499
Minority interests	$29,743			
Mandatory repurchase	$46,480			
Other		$180,369	$245,580	$168,286
Subtotal	$1,815,119	$5,405,146	$5,444,418	$5,694,785
Total liabilities	$2,037,375	$5,767,106	$5,935,387	$6,182,067
Redeemable preferred stock of subsidiary		$902,348	$1,036,648	$1,137,373
Class A: 400 million shares authorized	$935	$1,128	$1,212	$1,225
Class B: 200 million shares authorized	$705	$666	$611	$601
Additional paid-in-capital	$1,646,247	$2,156,722	$2,226,167	$2,232,780
Less Class B stock held in Treasure, at cost	($10,958)			
Cumulative accretion of mandatory repurchase obligation	($42,725)			
Deficit	($590,235)	($113,805)	($483,329)	($772,498)
Total stockholders' investment	$1,003,969	$2,947,059	$2,781,309	$2,599,481
Total liabilities and stockholders' investment	$3,041,344	$8,714,165	$8,716,696	$8,781,548

Sources: McCaw Cellular communication 1991, 1992 annual reports.

Appendix 8. Applications of discount cash flow approach



Appendix 9. The structure of thesis



Appendix 10: McCaw's Cellular Industry Projections

Year	1992	1993	1994	1995	1996	1997	1998	1999
Population (millions)	256.10	258.60	261.10	263.60	266.20	268.80	271.40	274.00
% Coverage	97%	97%	97%	97%	97%	97%	97%	97%
Net POPs covered (millions)	248.42	250.84	253.27	255.69	258.21	260.74	263.26	265.78
% Penetration year-end (McCaw view)	4.5%	5.5%	6.8%	8.5%	10.4%	12.9%	15.9%	19.7%
Annual penetration gain (McCaw view)	1.3%	1.0%	1.3%	1.7%	1.9%	2.5%	3.0%	3.8%
Subscriber market size(mm)(McCaw view)	11.18	13.80	17.22	21.73	26.85	33.63	41.86	52.36
Annual growth (McCaw view)	46.0%	26.0%	24.7%	24.7%	24.7%	24.7%	24.7%	24.7%
Average subscribers (mm)(McCaw view)	9.30	12.49	15.51	19.48	24.29	30.24	37.75	47.11
Churn rate	2.2%	2.1%	2.0%	1.9%	1.8%	1.8%	1.7%	1.6%
High-use %of local subscribers	32.9%	29.6%	26.6%	24.0%	21.6%	19.4%	17.5%	15.7%
Mid-range %of local subscribers	38.1%	37.4%	36.4%	35.1%	33.4%	32.5%	31.0%	29.4%
Low-use/PCS %of local subscribers	29.0%	33.0%	37.0%	41.0%	45.0%	48.1%	51.5%	54.9%
High-use local revenue/Subscribers	$107.64	$106.86	$104.56	$102.32	$100.15	$98.05	$96.00	$94.02
Mid-range local revenue/Subscribers	$64.41	$64.26	$63.92	$63.58	$63.24	$62.91	$62.58	$62.26
Low-use/PCS local revenue/Subscribers	$25.25	$25.50	$26.01	$26.79	$27.60	$28.70	$29.85	$31.04
Combined local revenue/Subscribers per month	$67.28	$64.09	$60.75	$57.84	$55.16	$53.30	$51.56	$50.14
Combined local revenue/Subscribers	$807.32	$769.07	$729.06	$694.09	$661.92	$639.58	$618.69	$601.68
Total local revenue (millions)	7508.032	9603.838	11307.12	13519.52	16080.78	19343.99	23353.41	28344.35
Roaming revenue/Subscribers per month	$9.61	$8.70	$8.00	$7.43	$6.89	$6.43	$5.96	$5.51
Combined roaming annual revenue/Subscribers	$115.32	$104.40	$96.00	$89.16	$82.68	$77.16	$71.52	$66.12
Total roaming revenue (millions)	1072.476	1303.699	1488.886	1736.657	2008.631	2333.673	2699.628	3114.804
Total revenue/Average subscribers per month	$76.89	$72.79	$68.75	$65.27	$62.05	$59.73	$57.52	$55.65
Total annual revenue (millions)	8580.508	10907.54	12796.01	15256.18	18089.41	21677.66	26053.04	31459.15

Appendix 10: (Continue) McCaw's Cellular Industry Projections

Year	2000	2001	2002	2003	2004	2005	2006	2007
Population (millions)	276.60	279.30	282.00	284.80	287.65	290.52	293.43	296.36
% Coverage	97%	97%	97%	97%	97%	97%	97%	97%
Net POPs covered (millions)	268.30	270.92	273.54	276.26	279.02	281.81	284.63	287.47
% Penetration year-end(McCaw view)	24.3%	30.0%	37.1%	45.8%	56.3%	69.3%	85.2%	104.8%
Annual penetration gain (McCaw view)	4.6%	5.7%	7.1%	8.7%	10.5%	13.0%	15.9%	19.6%
Subscriber market size (mm)(McCaw view)	65.20	81.28	101.48	126.53	157.18	195.27	242.58	301.36
Annual growth (McCaw view)	24.7%	24.7%	24.7%	24.7%	24.7%	24.7%	24.7%	24.7%
Average subscribers (mm)(McCaw view)	58.78	73.24	91.38	114.00	141.85	176.22	218.92	271.97
Churn rate	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%
High-use %of local subscribers	14.2%	12.7%	11.5%	10.3%	9.3%	8.4%	7.5%	6.8%
Mid-range %of local subscribers	27.4%	25.3%	23.4%	22.0%	20.7%	19.4%	18.3%	17.2%
Low-use/PCS %of local subscribers	58.5%	62.0%	65.0%	67.3%	70.0%	72.2%	74.2%	76.0%
High-use local revenue/Subscribers	$92.10	$90.24	$86.43	$86.68	$83.21	$79.88	$76.69	$73.62
Mid-range local revenue/Subscribers	$61.93	$60.98	$60.05	$59.15	$57.38	$55.65	$53.98	$52.37
Low-use/PCS local revenue/Subscribers	$31.35	$31.67	$31.98	$32.30	$32.62	$32.95	$33.28	$33.61
Combined local revenue/Subscribers per month	$48.35	$46.57	$44.75	$43.70	$42.44	$41.29	$40.33	$39.54
Combined local revenue/Subscribers	$580.23	$558.79	$537.04	$524.40	$509.31	$495.46	$483.95	$474.51
Total local revenue (millions)	34104.5	40923.68	49074.84	59783.94	72247.7	87311.62	105949.4	129053.6
Roaming revenue/Subscribers per month	$5.04	$4.58	$4.35	$4.07	$3.74	$3.44	$3.17	$2.92
Combined roaming annual revenue/Subscribers	$60.48	$54.96	$52.20	$48.84	$44.93	$41.34	$38.03	$34.99
Total roaming revenue (millions)	3554.895	4025.097	4770.027	5567.97	6373.888	7284.818	8325.935	9515.845
Total revenue/Average subscribers per month	$53.39	$51.15	$49.10	$47.77	$46.19	$44.73	$43.50	$42.46
Total annual revenue (millions)	37659.39	44948.78	53844.87	65351.91	78621.58	94596.44	114275.3	138569.5

Appendix 11: Financial Forecast of McCaw Cellular Prepared by McCaw, Assuming Remaining Portion of LIN Broadcasting is purchased

Annual population growth rate	1.00%								
Annual penetration growth rate	23.50%	After 2002, 23%							
Purchase remainder of LIN in 1995	Y								
Direct costs and exp.(except mktg) (% service rev.)	33.19%	33.0%	32.4%	31.9%	31.3%	30.8%	30.3%	29.8%	29.3%
Direct cost increment	-1.70%								
Marketing expenses (% service rev.)	26.43%	25.9%	23.8%	21.9%	20.2%	18.6%	17.1%	15.7%	14.4%
Marketing expenses increment (%)	-8.00%								
Depreciation plus amortization (% service rev.)	35.24%	34.8%	33.1%	31.4%	29.8%	28.3%	26.9%	25.6%	24.3%
D&A increment (%)	-5.00%								
Capital expenditures per net subscriber additions ($)	$1,147	1000	850	750	650	575	550	520	500
Net working capital (NWC) per subscriber	$198	150	60	24	10	4	2	2	2
Tax rate	36%								
	9/30/92	12/31/92	12/31/93	12/31/94	12/31/95	12/31/96	12/31/97	12/31/98	12/31/99
McCaw POPs(millions)	45.00	45.11	45.56	46.02	46.48	46.95	47.42	47.89	48.37
Penetration (from penetration growth factor)	2.12%	2.24%	2.76%	3.41%	4.21%	5.20%	6.43%	7.94%	9.80%
MCCaw subscribers	0.95	1.01	1.26	1.57	1.96	2.44	3.05	3.80	4.74
LIN Pops(millions)	26.40	26.47	26.73	27.00	27.27	27.54	27.82	28.10	28.38
LIN penetration	2.38%	2.51%	3.10%	3.83%	4.73%	5.84%	7.22%	8.91%	11.01%
LIN subscribers	0.63	0.66	0.83	1.03	1.29	1.61	2.01	2.50	3.12
McCaw share of LIN subscribers	0.31	0.35	0.43	0.54	0.67	1.61	2.01	2.50	3.12
McCaw share of LIN Pops	13.73	13.76	13.90	14.04	14.18	27.54	27.82	28.10	28.38

Appendix 11. (Continue) Financial Forecast of McCaw Cellular Prepared by McCaw, Assuming Remaining Portion of LIN Broadcasting is purchased

	9/30/92	12/31/92	12/31/93	12/31/94	12/31/95	12/31/96	12/31/97	12/31/98	12/31/99
Proportionate McCaw POPs	58.73	58.87	59.46	60.06	60.66	74.49	75.24	75.99	76.75
Proportionate McCaw subscribers									
Beginning subscribers (millions)		1.26	1.36	1.69	2.11	2.63	4.05	5.06	6.30
Subscribers added		0.10	0.33	0.42	0.52	1.42	1.01	1.24	1.56
Ending subscribers	1.26	1.36	1.69	2.11	2.63	4.05	5.06	6.30	7.86
Period average subscribers		1.31	1.52	1.90	2.37	3.34	4.56	5.68	7.08
Avg. net rev/sub per month ($)		76.00	72.00	68.20	62.35	58.10	50.71	48.47	47.08
Total net service revenue (millions)		299	1317	1554	1772	2328	2772	3304	4001
% Growth net service revenue			340%	18%	14%	31%	19%	19%	21%
Direct costs and expenses (except marketing)		99	427	495	555	717	840	984	1171
Marketing		77	314	341	357	432	473	519	578
Operating cash flow		123	576	718	859	1179	1459	1801	2252
Depreciation and amortization (millions)		105	458	514	556	695	786	890	1023
Cellular operating income (millions)		18	118	204	303	484	673	912	1228
After -tax cellular operating income (millions)		11	75	131	194	310	431	584	786
(+) Depreciation and amortization		105	458	514	556	695	786	890	1023
(-)CapEx		96	278	316	336	817	554	647	779
(-)^NWC			-105	-46	-22	-10	-4	2	3
Free cash free		20	361	374	436	198	667	824	1028

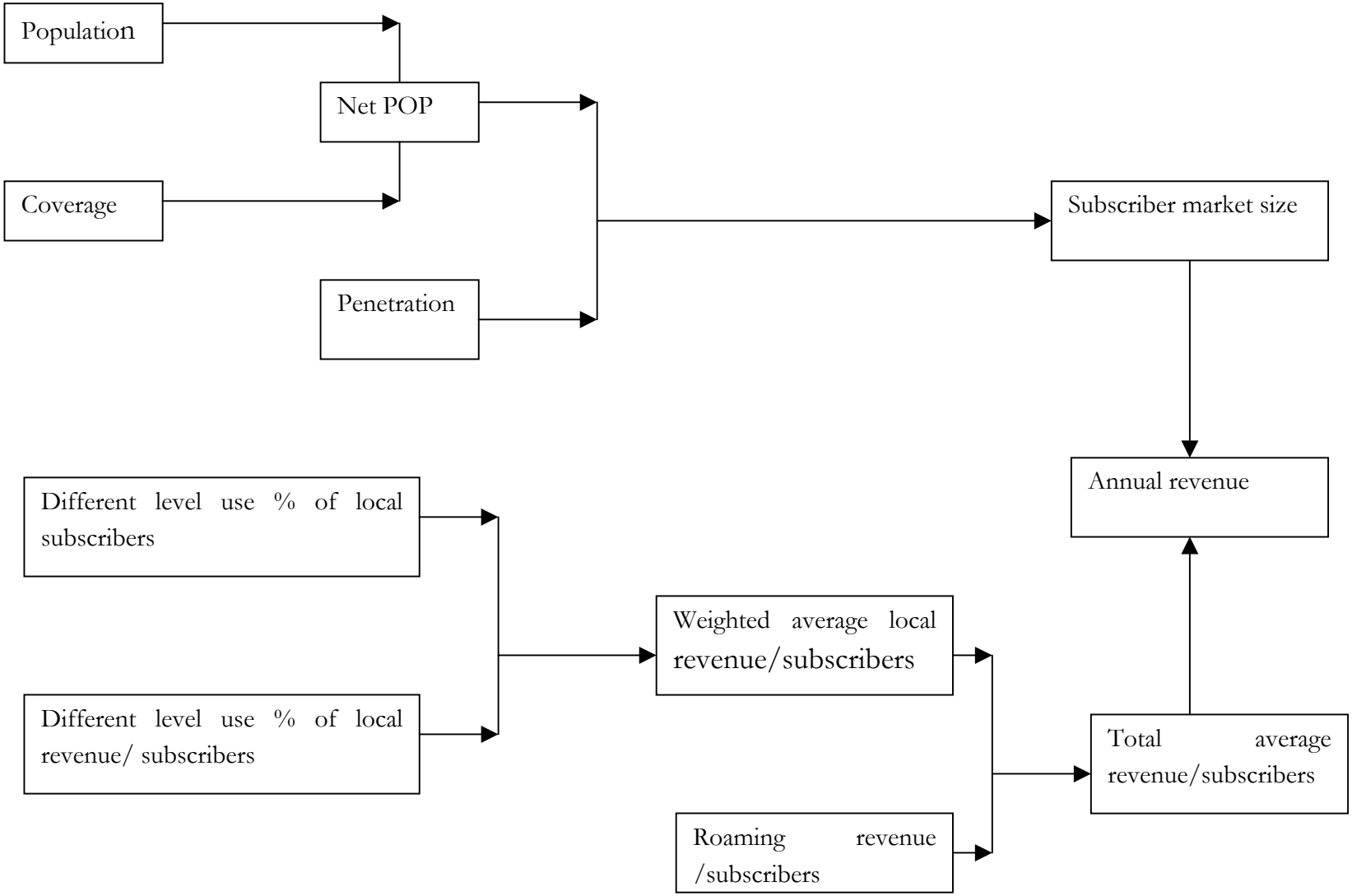
Appendix 11. (Continue) Financial Forecast of McCaw Cellular Prepared by McCaw, Assuming Remaining Portion of LIN Broadcasting is purchased

Annual population growth rate	1.00%								
Annual penetration growth rate	23.50%	After 2002, 23%							
Purchase remainder of LIN in 1995	Y								
Direct costs and exp.(except mktg) (% service rev.)	28.8%	28.3%	27.8%	27.3%	26.9%	26.4%	26.0%	25.5%	25.1%
Direct cost increment									
Marketing expenses (% service rev.)	13.3%	12.2%	11.3%	10.4%	9.5%	8.8%	8.1%	7.4%	6.8%
Marketing expenses increment (%)									
Depreciation plus amortization (% service rev.)	23.1%	21.9%	20.8%	19.8%	18.8%	17.9%	17.0%	16.1%	15.3%
D&A increment (%)									
Capital expenditures per net subscriber additions ($)	500	450	450	418.5	389.205	361.9607	336.6234	313.0598	291.1456
Net working capital (NWC) per subscriber	2	2	2	2	2	2	2	2	2
Tax rate									
	12/31/00	12/31/01	12/31/02	12/31/03	12/31/04	12/31/05	12/31/06	12/31/07	12/31/08
McCaw POPs(millions)	48.84	49.34	49.84	50.34	50.84	51.35	51.86	52.38	52.91
Penetration (from penetration growth factor)	12.06%	14.96%	18.48%	22.73%	27.96%	34.39%	42.30%	52.03%	63.99%
McCaw subscribers	5.89	7.38	9.21	11.44	14.21	17.66	21.94	27.25	33.86
LIN Pops(millions)	28.65	28.95	29.24	29.53	29.83	30.13	30.43	30.73	31.04
LIN penetration	13.53%	16.80%	20.74%	25.51%	31.38%	38.59%	47.47%	58.39%	71.82%
LIN subscribers	3.88	4.86	6.06	7.53	9.36	11.63	14.44	17.94	22.29
McCaw share of LIN subscribers	3.88	4.86	6.06	7.53	9.36	11.63	14.44	17.94	22.29
McCaw share of LIN Pops	28.65	28.95	29.24	29.53	29.83	30.13	30.43	30.73	31.04

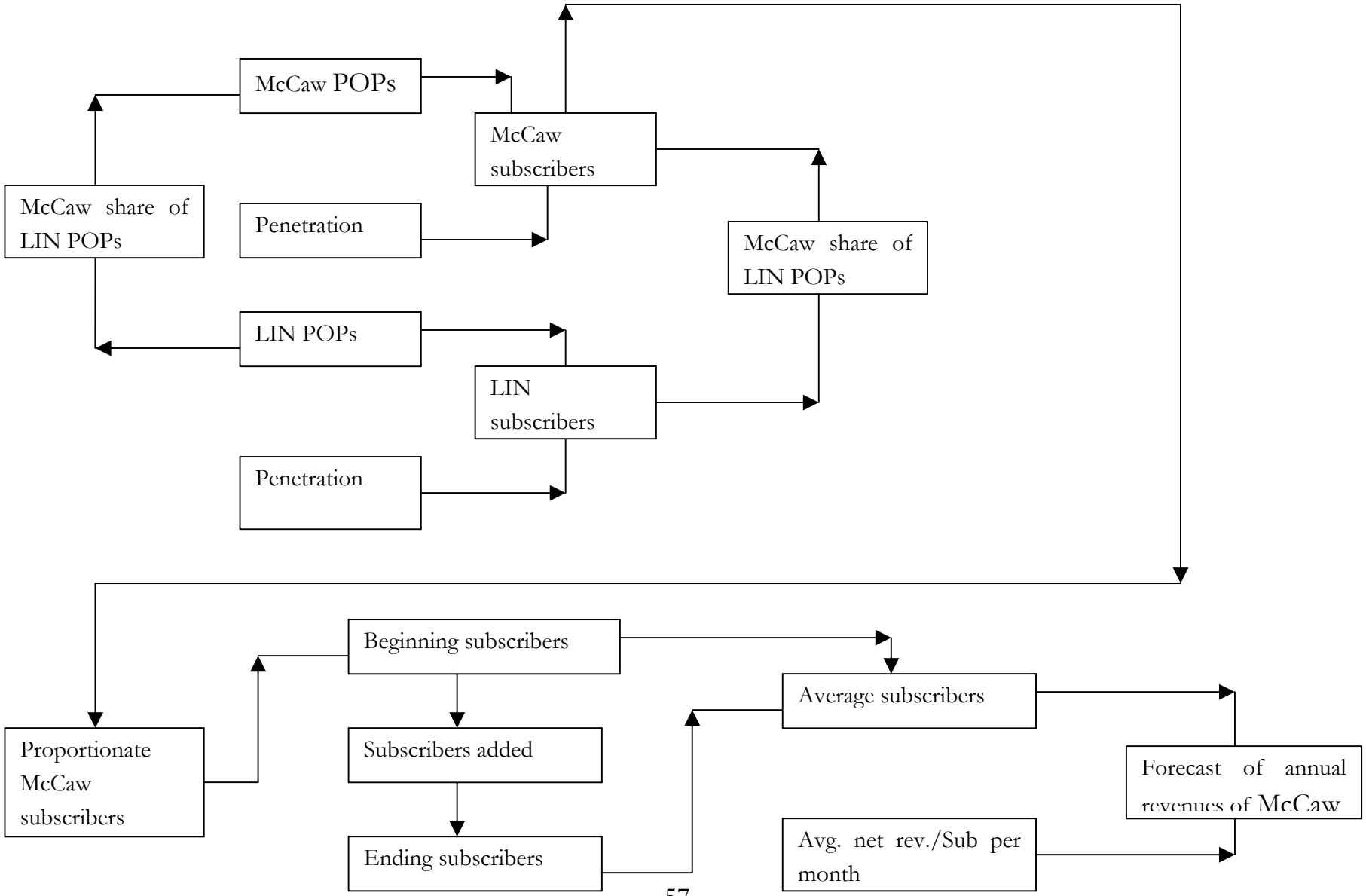
Appendix 11. (Continue) Financial Forecast of McCaw Cellular Prepared by McCaw, Assuming Remaining Portion of LIN Broadcasting is purchased

	12/31/00	12/31/01	12/31/02	12/31/03	12/31/04	12/31/05	12/31/06	12/31/07	12/31/08
Proportionate McCaw POPs	77.49	78.29	79.08	79.87	80.67	81.48	82.29	83.11	83.95
Proportionate McCaw subscribers									
Beginning subscribers (millions)	7.86	9.77	12.24	15.27	18.98	23.57	29.29	36.38	45.20
Subscribers added	1.91	2.47	3.03	3.71	4.60	5.71	7.10	8.82	10.95
Ending subscribers	9.77	12.24	15.27	18.98	23.57	29.29	36.38	45.20	56.15
Period average subscribers	8.82	11.01	13.76	17.12	21.27	26.43	32.83	40.79	50.67
Avg. net rev/sub per month ($)	46.36	45.69	45.06	42.36	39.82	37.43	35.18	33.07	31.09
Total net service revenue (millions)	4904	6034	7438	8703	10165	11870	13861	16187	18902
% Growth net service revenue	23%	23%	23%	17%	17%	17%	17%	17%	17%
Direct costs and expenses (except marketing)	1411	1707	2068	2378	2731	3134	3598	4130	4741
Marketing	652	738	837	901	968	1040	1117	1200	1289
Operating cash flow	2841	3590	4533	5424	6466	7696	9146	10856	12872
Depreciation and amortization (millions)	1192	1393	1631	1813	2012	2232	2476	2747	3048
Cellular operating income (millions)	1649	2197	2902	3611	4454	5464	6670	8109	9824
After -tax cellular operating income (millions)	1056	1406	1857	2311	2851	3497	4269	5190	6287
(+) Depreciation and amortization	1192	1393	1631	1813	2012	2232	2476	2747	3048
(-)CapEx	955	1112	1363	1551	1790	2067	2389	2760	3188
(-)^NWC	3	4	6	7	8	10	13	16	20
Free cash free	1289	1683	2120	2567	3065	3651	4343	5161	6127

Appendix 12. Calculation process of Annual revenue



Appendix 13. Calculation process of annual revenue of McCaw



Appendix 14. Present value of free cash flow

	1992	1993	1994	1995	1996	1997	1998	1999
Free cash free (million)	20	361	374	436	198	667	824	1,028
Discounted rate	1.0926	1.1938	1.3043	1.4251	1.5571	1.7012	1.8588	2.0309
Present value (million)	18	302	287	306	127	392	444	506

	2000	2001	2002	2003	2004	2005	2006	2007
Free cash free (million)	1,289	1,683	2,120	2,567	3,065	3,651	4,343	5,161
Discounted rate	2.2190	2.4244	2.6489	2.8942	3.1622	3.4551	3.7750	4.1246
Present value (million)	581	694	800	887	969	1,057	1,151	1,251

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