2016

Valuing Commercial Finance Companies

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This is to certify that the doctoral study by

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2016

Abstract

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by

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MBA, Keller Graduate School of Management, 1988

BS, Northern Illinois University, 1982

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

March 2016

Abstract

Stakeholders are increasingly insistent that companies increase firm value. The problem is that stakeholders of financial services firms are unable to accurately determine firm value. The purpose of this correlational study was to examine the accuracy of 4 valuation models in predicting the market value of equity of commercial finance companies. Study participating companies were 8 listed U.S. or Canadian commercial finance companies. The theoretical constructs of the study included the accuracy of valuation models, modern portfolio theory, and the correlation of book value of equity to market value of equity. Financial information on participating companies obtained from public filings were input data in 4 valuation models. Multiple regression analysis of valuation model results and book value of equity (the predictor variables) were used to determine the accuracy of the models in predicting the market value of equity (response variable). The findings of the study showed that all 4 valuation models in combination with the book value of equity were statistically significant predictors of the market value of equity of the participating companies at the $p < .05$ level. However, the dividend discount model (DDM) and residual income model (RIM) were statistically more accurate without the combination of book value of equity ($p = .000$ and $p = .000$, respectively) than the discounted cash flow and risk-adjusted discounted cash flow valuation models ($p = .371$ and $p = .904$, respectively). The results of this study contribute to positive social change by providing business leaders an ability to measure the effectiveness of their actions in creating firm value. Corporate social responsibility activities correlate to value creation for firms that engage in promoting employee welfare and other stakeholder welfare.

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Dedication

I dedicate this doctoral study to my wife Brenda, whose love and unwavering commitment encouraged me to preserver and celebrate my successes. To my daughter Laura, who always believed in me, and thus gave me the courage to undertake and complete my doctoral journey.

Acknowledgements

I am thankful for the tutelage and assistance received from the faculty and support staff of Walden University that aided me in completing my doctoral program. I am especially appreciative of the support given me by members of my doctoral study committee. Specifically, Dr. William Stokes, Committee Chair, who mentored me throughout the doctoral study process and gave me encouragement when I needed it most. Dr. Kevin Davies, Committee Member, who challenged me to strive for excellence in my work. And, Dr. Wilton Heyliger, University Reviewer, who provided critical commentary and analysis of my doctoral study that aided me in completing a dissertation that I can take great pride in. I am further thankful for Dr. Freda Turner, Program Director, and her tireless efforts in creating a best-in-class DBA program!

"The highest activity a human being can attain is learning for understanding, because to understand is to be free."

- Baruch Spinoza

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Section 1: Foundation of the Study

The intrinsic value of any income-producing asset is the discounted value of all future cash flows generated by the asset during the asset's income producing life (Damodaran, 2010). The discounted cash flow (DCF) valuation model tabulates asset value as the sum of discounted predicted or expected future free cash flows (Bancel & Tierny, 2011). Expected future cash flows undergo discounting at an appropriate discount rate that reflects the expected risk-return of like-kind investments (Livingston, 2014). The value of a business enterprise corresponds to the discounted value of its cash flows from operations, plus the market value of nonoperating assets (Koller, Goedhart, & Wessels, 2010).

A company's book value of equity has a linear relationship with its market value of equity (Ohlson, 1995). The dividend discount model (DDM) values the equity of companies as the sum of all future discounted expected dividends (Norman, Schlaudraff, White, & Wills, 2013). The residual income model (RIM) values the equity of companies as the sum of book value of equity plus the sum of all future discounted residual income (Heinrichs, Hess, Homburg, Lorenz, & Sievers, 2013). Residual income is net income less an amount equal to a company's cost of equity capital. Retained earnings are undistributed net income that increases the book value of equity. Incoming cash flows of commercial finance companies include loan payments received from borrowers.

Future cash flows of commercial finance companies with loan portfolios are subject to risk relating to clients' ability and willingness to pay required monthly loan payments (DeYoung, Gron, Torna, & Winton, 2015). Therefore, sound conjecture supports valuing commercial finance companies by using a discount rate that corresponds to loan portfolio risks. Loan portfolio risk may differ from enterprise risk. Past studies of valuation sought to provide an understanding of similarities and differences between independent variables and outcomes known as dependent variables (Warren, 2011). This study links dependent variables of the market value of equity to independent variables of firm tabulated value using four valuation methods and company book value of equity. The foundation for this doctoral study relied on research and development of spreadsheet valuation models, and on portfolio theory; as it was specifically designed to address gaps in past research identified in the literature review.

Background of the Problem

Stakeholders in the U.S. are increasingly insistent that companies show positive long-term results demonstrated by increases in firm value (Koller et al., 2010). At least 20 different valuation models exist for business valuation (NACVA, 2013). The DCF valuation model is the most frequently used estimator of firm value (Oded, Michel, & Feinstein, 2011), but DCF valuation models are inherently inaccurate due to faulty implementation (Singh, 2013). DCF valuation inaccuracies are the result of analyst bias, divergent application of accounting rules, and inappropriate terminal value calculations (Heinrichs et al., 2013). Additionally, incorrect beta assumptions may cause DCF valuation errors due to incorrect cost of capital assumptions (Chong & Phillips, 2012). Contemporary DCF valuation models also produce inaccurate results that lead to undesirable management decision-making (Francis, Olsson, & Oswald, 2000; Heinrichs et al., 2013). As a result, the DCF valuation method may not be congruous in valuing banking and other financial services firms (Damodaran, 2010; Koller et al., 2010).

Dermine (2010) posited that the DCF valuation model is not well suited for valuing lending institutions because the DCF valuation model does not differentiate operational risk from asset portfolio risk. Damodaran (2010), Dermine (2010), and Koller et al. (2010) reasoned that equity valuation models are the preferred methodology for valuing financial services companies, such as banking institutions. However, equity valuation models do not include an assessment of loan portfolio risk attributes innate to commercial finance companies.

The foundation of this doctoral study is an examination of three contemporary valuation approaches and one portfolio asset risk-adjusted valuation model for valuing commercial finance companies. The objective of this doctoral study was to examine the relative accuracy of various valuation models for valuing commercial finance companies.

Problem Statement

Stakeholders of financial services firms are unable to accurately determine firm value (Antill, Hou, & Sarkar, 2014). Although Dermine (2010) argued in favor of using equity valuation models for valuing financial services firms, such models do not implicitly address unsystematic risks associated with loan portfolios (Damodaran, 2010). The DCF valuation model is the most commonly used valuation model (Fernández, 2013); however, several crucial challenges in using DCF valuation models for valuing financial services companies arise from complications in estimating operating cash flows (Damodaran, 2010). The general business problem is that leader reliance on inaccurate valuation leads to decision-making errors (Mousa, Ritchie, & Reed, 2014) that negatively affect stakeholders (Babawale, 2013). The specific business problem is that leaders of commercial finance companies lack an understanding of the accuracy of valuation models combined with book value in predicting firm equity value.

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship between four valuation model results, the book value of equity, and the market value of equity of participating commercial finance companies. The four valuation models used in this study were the DCF model, a portfolio asset risk-adjusted DCF (RADCF) model, the DDM, and the RIM. Specifically, I examined the relationship of these four models' valuation methodologies and book value of equity in accurately predicting market capitalization of commercial finance companies. This comparison is important because valuation model results that have a significant relationship with market capitalization are more accurate than valuation model results that do not have a significant relationship with market capitalization (Reddy, Agrawal, & Nangia, 2013).

The research data for this study included financial statement information of selected commercial finance companies. The market value of equity, otherwise known as market capitalization, of participating companies functioned as the dependent variable. Results of four valuation models and company book value of equity functioned as independent variables.

The potential social change impact of this study is that accurate valuation models may allow business leaders and other stakeholders the means of measuring the effectiveness of management actions in the creation of firm value that leads to business success. Successful companies enhance local economies, strengthen community bonds, provide career opportunities, and engage in socially responsible activities.

Nature of the Study

The purpose of this quantitative correlation study was to determine the relative accuracy of the DCF, RADCF, DDM, and RIM valuation models and book value of equity for predicting the value of commercial finance companies. The study design relied on multiple regression analysis and analysis of variance that provides a mathematical foundation for correlation and variance, as described by Dangl and Halling (2012). Correlation coefficients measure linear associations between two or more variables (Boslaugh, 2013). A correlation design supported the objective of this study, which was to determine the linear association between independent variables and dependent variables. Valuation model results and company book values were independent variables, and market value of equity of participating companies were dependent variables. Experimental and quasi-experimental designs, such as multivariate longitudinal studies, are appropriate when the researcher's aim is the determination of causal effects (Jaffee, Strait, & Odgers, 2012). Since the objective of this doctoral study was to identify a predictive model, experimental and quasi-experimental designs were not appropriate.

Quantitative data analysis improves understanding of the real-world phenomenon, by providing practitioners with mathematical evidence of relationships between variables (Boslaugh, 2013; Stentz, Plano Clark, & Matkin, 2012). A quantitative, comparative, and correlation research design best suited this study and the aim of determining the relative accuracy of four valuation models, combined with the book value of equity for valuing commercial finance companies. Qualitative research designs are designed to add to the body of knowledge by providing a foundation for interpretive review that aids in higher-order reasoning. However, qualitative research, as narrative data, does not produce results that allow for integrative synthesis of mathematical data (Stentz et al., 2012). Therefore, a qualitative study was not appropriate for this doctoral study.

Research Question

The primary research question investigated by this doctoral study was, "What are the relationships between valuation model results, the book value of equity, and market value of equity of participating companies?: Explicitly, the research question asked whether a linear combination of valuation model results and company book value of equity significantly predict the market value of equity of commercial finance companies. Valuation model results refer to the outcomes of valuing the participating companies using the DCF, RADCF, DDM, and RIM valuation models for each of five years (2009-2013). Company book value of equity is the reported stockholders' equity of participating companies for each of five years (2009-2013). The stockholders' equity is the value reported in annual 10-K reports filed with the Securities and Exchange Commission. The market value of equity is the average market capitalization of the participating companies for 21 days post-filing of annual 10-K reports for the five years of valuation (2009-2013).

In the multiple regression equation ($Y = b_0 + b_1X_1 + b_2X_2$), Y is the market value of equity (dependent variable), b_0 is the intercept, and b_1 and b_2 are the regression coefficients. In the equation, X_1 are valuation model results (independent variables), and X_2 are company book value of equity (independent variables).

The four valuation models reviewed in this study were the DCF valuation model, a risk-adjusted DCF valuation model, the dividend discount model, and the residual income model. The market value of equity of participating commercial finance companies is their respective market capitalization.

Past research identified weaknesses in the DCF valuation model for valuing financial institutions that lead to valuation inaccuracies (Dermine, 2010; Koller et al., 2010). Consequently, this study included an examination of the effectiveness of a risk-adjusted DCF valuation model, combined with company book value of equity, in accurately valuing commercial finance companies. The risk-adjusted DCF valuation model integrated adaptations consistent with modern portfolio theory. Additionally, the study featured comparisons of three other valuation models, which other researchers espoused as viable valuation models for valuing companies (Cornell, 2013, Heinrichs et al., 2013, and Oded et al., 2011).

Research subquestions addressed in this study were as follows.

1. What is the accuracy of a DCF valuation model, combined with company book value of equity, for predicting the market equity value of commercial finance companies?
2. What is the accuracy of a risk-adjusted DCF valuation model, combined with company book value of equity, for predicting the market equity value of commercial finance companies?
3. What is the accuracy of a DDM, combined with company book value of equity, for predicting the market equity value of commercial finance companies?

4. What is the accuracy of an RIM, combined with company book value of equity, for predicting the market equity value of commercial finance companies?

Answering the listed subquestions necessitated an examination of asset beta coefficients that represent the market volatility of highly concentrated and poorly diversified asset portfolios. Moreover, the study required an analysis of appropriate default spreads that exemplify risk characteristics of portfolio assets of commercial finance companies.

Hypotheses

The null hypothesis of this study was that the linear relationships of each of four valuation model results, combined with book value, are not accurate in predicting the market value of equity of participating companies. The following statements functioned as the study's null hypotheses and alternative hypotheses:

$H_0$1: The linear combination of DCF valuation model results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$1: The linear combination of DCF valuation model results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$2: The linear combination of risk-adjusted DCF valuation model results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$2: The linear combination of risk-adjusted DCF valuation model results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$3: The linear combination of DDM valuation results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$3: The linear combination of DDM valuation results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$4: The linear combination of RIM valuation results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$4: The linear combination of RIM valuation results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

Theoretical Framework

This study stands on the shoulders of past research of business valuation models and modern portfolio theory. The value of income-producing assets is the discounted value of all future cash flows generated by the assets during the assets' income producing life (Damodaran, 2010). Prior studies examined methods of valuing financial services firms, such as banking institutions. However, a gap exists in the body of knowledge regarding a suitable valuation methodology for valuing commercial finance companies that have undiversified loan portfolios. Organizational complexity and asymmetric information are reasons argued in favor of using equity valuation models in valuing financial services firms (Damodaran, 2010; Dermine, 2010; Koller et al., 2010). Unfortunately, equity valuation models do not consider portfolio risk dimensions that are inherent in loan portfolios of commercial financing companies. Therefore, equity valuation models do not accurately reflect the risk of default by borrowers.

The theory that valuations methodologies accurately value organizations and that modern portfolio theory seeks to maximize expected portfolio returns while simultaneously minimizing risks served as the underlying theoretical framework of this study. Moreover, the theoretical construct relating book value to market value (Asness, Moskowitz, & Pedersen, 2013) provided a foundation for this study, which built on past research by comparing the relationship of valuation model results to market capitalization (Michelfelder, Ahern, D'Ascendis, & Hanley, 2013).

Similar to research conducted by Fernandez (2007), this study featured a comparison of the accuracy of various valuation models. Likewise, the study included an evaluation of valuation models for valuing financial services firms, similar to research conducted by Dermine (2010) and Koller et al. (2010). Finally, the study relied on adaptations of modern portfolio theory regarding risk factors inherent in commercial loan portfolios (Rosen & Saunders, 2010).

Operational Definitions

Abnormal Earnings Valuation Model: The abnormal earnings valuation model values companies based on reported book value, plus the present value of all future abnormal earnings (Jorgensen, Yong Gyu, & Yong Keun, 2011).

Clean Surplus Accounting: Clean surplus accounting occurs when ending book value is equal to beginning book value, plus net income plus or minus payments from or to stockholders (Olibe, Strawser, & Strawser, 2011).

Dirty Surplus Accounting: Dirty surplus accounting reflects deviations from clean surplus accounting net income, due to inclusion of extraordinary items and special items (Heinrichs et al., 2013).

Equity Beta Coefficient: Equity Beta is a measure of the volatility of a security, relative to the overall securities market. The risk of a particular investment relates to the variation of its expected return, relative to the expected return of the market (Penman, 2011).

Equity Premium or Market Risk Premium: Equity premium or market risk premium is the excess return on an equity investment that exceeds the risk-free rate of return (Penman, 2011).

Management Decisioning or Management Decision-making: Management decisioning, or management decision-making, reflects management vision, technical knowledge, and industry experience that leads to management actions (Mousa et al., 2014).

Pricing Differential or Variant Price: Pricing differential or variant price is the difference or variance between the market capitalization of one or more common stocks and firm valuation (Jewczyn, 2013).

Risk-Free Rate: The risk-free rate is the expected return on investment in a riskless investment or security (Koller et al., 2010). The closest approximations of riskless investments are U.S. government bonds (S. Norman et al., 2013).

Semistrong Form Efficiency: Semistrong form efficiency is a theory that stock prices include all publically available information. As such, investors may only earn abnormal stock investment returns by relying on information that is not accessible by the public (Fama, 1970; Jarrow & Larsson, 2012).

Terminal Value: Terminal value is the discounted value of a stream of perpetual cash flows, using a constant growth rate and cost of capital (Sellers, Greiner, & Schaberl, 2013).

Assumptions, Limitations, and Delimitations

Assumptions

Semistrong form market efficiency is the prevailing assumption of the equities market in the U.S., where market equity prices reasonably adjust to all publically available information (Fama, 1970). Fama (1970) argued in support of semistrong form market efficiency, rather than strong form market efficiency or fully efficient markets. Fama (1970) reasoned that market participants either do not possess or have access to all relevant information. Furthermore, market participants may not act on certain information, due to marginal costs such as brokerage fees and other costs associated with equity trading (Fama, 1970).

Modigliani and Miller (1958) posited the existence of systematic imperfections in the market that bias outcomes. Moreover, market participants may behave ambiguously regarding information recently obtained, if participants perceive such information as market noise (Lambert, Leuz, & Verrecchia, 2012). As evidence of market inefficiency, Fama and French (2004) noted irrational pricing or risk taking by investors as overreactions to positive or negative news. Some investors over-extrapolate company past performance, leading to overpricing high growth companies and underpricing distressed companies (Fama & French, 2004). Summarily, semistrong market efficiency was the prevailing assumption adhered to in this study.

The risk-free rate is a crucial component of the CAPM. The risk-free rate is an indicator of the relationship between investment risk and investor expected return (Jerry Ho, Tsai, Tzeng, & Fang, 2011). Fama and French (2002) rationalized the use of the six-month commercial paper rate as a proxy for the risk-free rate, because of its negligible inflation risk. However, Livingston (2014) argued instead in favor of a constant maturity U.S. Treasury Bond rate, with a maturity that best approximates the duration of the asset subject to valuation. Koller, et al. (2010) and Damodaran (2010) preferred the 10-year zero-coupon government bond as an appropriate surrogate for the risk-free rate when valuing companies in real terms (e.g., preinflation dollars). However, Hitchner (2011) argued in support of using market yields on the 30-year constant maturity U.S. Treasury Bond, with 20 years remaining as the risk-free rate.

According to Damodaran (2012), 30-year U.S. Treasury Bond rates are a reasonable proxy for the risk-free rate. The 30-year U.S. Treasury Bond is a reasonable proxy for the risk-free rate because of a low probability of default, low reinvestment risk, and ease of matching term with corporate bonds (Damodaran, 2012). The 30-year constant maturity U.S. Treasury Bond or equivalent Canadian Bond rate was the risk-free rate assumption used in this study.

Limitations

Income valuation models require an estimation of expected or projected future free cash flows (Penman, 2010). Estimation of reliable future cash flows is problematic, due to market volatility (R. Bansal, Kiku, Shaliastovich, & Yaron, 2014) and estimation bias (Badertscher, Collins, & Lys, 2012). Moreover, extrapolation of projected cash flows from past financial statements is challenging, because financial statement data are subject to management discretion and manipulation (Dan-Bee, Ho-Young, & Eun-Jung, 2013). Thus, estimations of future cash flows based on financial statement data are subject to bias and future market volatility that leads to inherently inaccurate estimations.

Future growth rate assumptions are estimations based on historical growth rates, analysts' forecasted growth rates, growth rates based on firm fundamentals, and management provided estimations (Damodaran, 2012). Such estimations of future growth rates are subject to estimation error and bias and, therefore, are inherently inaccurate. The formulation of discount rates used as the cost of capital or cost of equity require judgmental interpretation of unsystematic risk (Hitchner, 2011) that may cause overestimation or underestimation of firm value, if interpreted incorrectly. The cost of capital formulations may require the use of industry betas (Damodaran, 2012). Unfortunately, historical industry betas for the commercial finance industry are not readily available.

Delimitations

Participating companies featured in this study are publically traded commercial finance companies with loan portfolios that are a majority of their earning assets. Moreover, the participating commercial finance companies are not subsidiary companies of nonfinancial services firms or banking institutions and have accounting and financial information that are publically available. According to the ELFA (2013), the majority of commercial finance companies in the U.S. are privately held companies or subsidiary companies of nonfinancial services firms or banking institutions. Lack of transparency prohibited the inclusion of nonlisted companies or wholly owned subsidiary companies of listed companies in this study. As such, this study examined various valuation models in the context of sample companies that may not fully represent the entire commercial finance industry.

Significance of the Study

This study's findings assist stakeholders in determining accurate firm values of commercial finance companies. Accurate valuation provides senior managers and other stakeholders with superior capability of evaluating performance and risk management measures undertaken by management (Frigo & Anderson, 2011). Stakeholders of corporate amalgamations, mergers, takeovers, buyouts, and governance, who rely on valuation results, benefit from improved valuation result accuracy (Reddy et al., 2013). Value creation is a fundamental element in determining organizational success (Lee, Olson, & Trimi, 2012). In short, accurate valuation models can be used by managers and other stakeholders to determine the intrinsic value of commercial finance companies.

Successful organizations support society by providing innovation, job creation, and investment in communities that enhance the lives of local citizens (Porter & Kramer, 2011). Employees, their families, and other stakeholders of organizations derive quality of life benefits through their interrelationships with efficacious companies. Successful commercial finance companies provide small and medium-sized enterprises (SMEs) with financing capital needed by those businesses to maintain and grow firm operations. Past studies support the notion that SMEs are chiefly responsible for job creation in the U.S. (Navarro, Casillas, & Barringer, 2012). Commercial finance companies tend to provide financing to observably riskier businesses than do commercial banks (Flannery & Wang, 2011). Risk factors such as a limited time in business, tight cash flow, or high financial and operating leverage often limit businesses from obtaining financing provided by commercial banks (Flannery & Wang, 2011). Therefore, an interconnection exists between the financial performance of commercial finance companies and its SMEs borrowers, and vice versa.

This study extends corporate finance and accounting professionals' understanding of business valuation via one or more valuation models that accurately value commercial finance companies. The commercial financing industry is vital to the U.S. business community: Loans provided by commercial finance companies represent approximately 10% of all debt of businesses in the United States (CFA, 2013; ELFA, 2014; FRED, 2014). As such, industry participants and related stakeholders represent a significant cross-section of U.S. citizens. A particular uniqueness of commercial finance companies is their sizable loan portfolios, comprised of contractual obligations of nonrelated borrower firms (ELFA, 2013). Loans held by commercial finance companies are medium-termed receivables, subject to cyclical risk, maturity risk, reinvestment risk, industry and geographic concentration risk, interest rate risk, and inflation risk. Moreover, loan portfolio assets of commercial financing companies often make up a significant percentage of their total assets (ELFA, 2013). Furthermore, commercial finance companies often have one or more industry concentration risks in their loan portfolios, rather than having highly diverse portfolios (ELFA, 2015).

Prior studies of business valuation models have failed to consider inherent risks associated with portfolio assets comprised of loans, and instead focused solely on enterprise risk (Penman, 2010). This study extended prior research on business valuation through an examination of various valuation models to determine an accurate valuation model for valuing commercial finance companies, with an inclusion of portfolio risk assessments.

Contribution to Business Practice

Contemporary business valuation methodologies do not accurately value commercial finance companies because most valuation models focus on valuing companies as a single operating entity, rather than including risk factors associated with loan portfolios. Specifically, commercial finance companies with loan portfolios that comprise a majority of total assets have asset risk factors that differ from other operating assets. The discount rate used in DCF valuation models should include a premium or discount relating to portfolio or unsystemic risk (Hitchner, 2011). Therefore, existing valuation methods that do not include portfolio risk adjustments to the cost of equity may not provide stakeholders of commercial finance companies the ability to accurately derive firm value (Koller, et al, 2010). Valuation models provide company stakeholders a means to gauge the effectiveness of corporate governance in creating value through organic or inorganic growth strategies (Reddy et al., 2013). Moreover, valuation models provide stakeholders of private companies an ability to appraise the value of their interest in allied companies. Therefore, valuation models that address loan portfolio risk may produce more accurate results of the value of commercial finance companies than models that do not address loan portfolio risk.

This study contributes to the body of knowledge of business valuation via the development of a valuation framework conducive for accurate determination of the value of commercial finance companies. It is designed to address a gap in the existing literature, which is void of prior studies that focus on valuing commercial finance companies.

Implications for Social Change

This study was designed to identify one or more accurate valuation models, and by doing so to assist stakeholders of commercial finance companies in determining the effectiveness of management actions in creating value. Shareholders benefit through improved valuation accuracy, as value creation correlates with long-run abnormal returns (Toms, 2010). Moreover, value creation strongly relates to corporate sustainability, where dimensions of sustainability include economic responsibility, social responsibility, and environmental responsibility (Pätäri, Jantunen, Kyläheiko, & Sandström, 2012). Corporate social performance activities correlate to value creation for firms that engage in promoting employee safety and welfare, environmental welfare, and other stakeholder welfare (Cheung, Jiang, Mak, & Tan, 2013).

A Review of the Professional and Academic Literature

The focus of this study was a computational estimation of the intrinsic value of commercial finance companies with loan portfolios that comprise a majority of total assets. In this literature review, I address the most prominent methods of business valuation and their respective usefulness in accurately valuing organizations. These are the dividend discount model, discounted cash flow model, and residual income model. Topics relating to business valuation models addressed in the literature review are market efficiency, company growth rates, and cost of capital. The subject of cost of capital includes related subtopics of the capital asset pricing model (CAPM), beta coefficients, and the cost of debt. Other related subtopics include the cost of equity, firm capital structure, and alternative methods for determining the cost of capital.

Source material used in this study included journal articles, dissertations, textbooks, books by topic experts, and websites (see Table 1).

Table 1

Doctoral Study Sources

Source	Doctoral study sources 2011 and later	Doctoral study sources pre-2011	Total
Peer-reviewed articles	182	28	210
Nonpeer-reviewed articles	11	0	11
Dissertations	2	0	2
Textbooks	0	1	1
Books by topic experts (peer-reviewed)	2	1	3
Books by topic experts (not peer-reviewed)	3	5	8
Professional and Governmental web sites	7	0	7
Total	207	35	242
% of sources 2011 or later	85.5%	14.5%	85.5%
% of peer-reviewed sources	76.8%	12.4%	89.2%

The purpose of this study was to examine the accuracy of four valuation models, combined with the book value of equity, for valuing commercial finance companies. Valuation professionals and academics use the dividend discount model, the residual income model, and the discounted cash flow model (Fernández, 2013). Current valuation practices do not specifically address cash flow risks inherent in loan portfolios. This study included an examination of the linear combination of four valuation models and company book value in predicting commercial finance company equity value. The study's null hypothesis was that one or more of the four valuation methods would, when combined with the book value of equity, be statistically significant in valuing commercial finance companies accurately.

The literature review includes a critical analysis and syntheses of subject matter in relation to the study's theoretical framework. The review begins with an analysis of market efficiency and the relationship between book value of equity and market value of equity. Next, the literature review includes a syntheses of cost of equity capital and related capital asset pricing model, beta coefficients, and the weighted average cost of capital. A synthesis of alternative cost of equity measurements follows the analysis of cost of equity. Then, the literature review contains an analysis of several business valuation methodologies including the DCF, DDM, and RIM, and related growth rate considerations. Finally, the literature review includes an analysis of credit portfolio risk and its impact on nonsystematic risk. The literature review includes a synthesis of the independent and dependent variables.

Market Efficiency

A discussion of market efficiency provides a framework for understanding variances in valuation model results relative to the market capitalization of listed companies. Past research on business valuation methodologies often attempted to reconcile valuation model results with an observed market capitalization of valued firms (Patatoukas, 2014). Acceptance of the theory of semistrong form market efficiency in U.S. equity markets allows for comparison of valuation model results with market capitalization. However, market capitalization is only an approximate proxy for the firm equity value and not a near-perfect equivalent of true value (Heinrichs et al., 2013).

At times, equity markets may be weak form efficient, semistrong form efficient, or strong form efficient, relative to the degree to which stock prices fully reflect all available information (Fama, 1970). Fama (1970) found compelling proof of the existence of semistrong form market efficiency in the equity markets in the United States, where stock price adjusts efficiently to publically available information. Strong form efficient refers to the notion that security prices reflect all relevant public and private information (Fama, 1970). Equity markets in the U.S. are not strong form efficient, as the continued existence of arbitrage opportunities contradict the notion of strong form efficiency (Fama, 1970). As such, the market value of equity of publicly traded companies may differ from valuation model results, as the market may overvalue or undervalue the equity value of companies.

Economic concepts provide a framework for understanding the notion of market efficiency. Armstrong, Core, Taylor, and Verrecchia (2011) argued that an infinite number of equity traders of a particular stock might replicate perfectly competitive markets. Conversely, a finite number of equity traders correspond to imperfectly competitive markets (Armstrong et al., 2011). In imperfectly competitive equity markets, investors have the perception of downward-sloping demand curves, whereas traders in perfectly competitive equity markets face flat demand curves (Armstrong et al., 2011). As such, traders in imperfectly competitive markets perceive that other trading activities relate to information asymmetry (Armstrong et al., 2011).

Other factors not based on internal and external premises influence deviations between market value and real firm value (Reis & Augusto, 2013). Efficiency variance may relate to investor or trader precision errors and forecast errors (Harel, Harpaz, & Francis, 2011). High information asymmetry associated with imperfect competitive markets leads to higher cost of capital. Investors seek higher returns to compensate for greater information risk (Armstrong et al., 2011; Lambert et al., 2012). Traders use a priori information in an attempt to overcome information asymmetry (Harel et al., 2011). In short, traders rely on the inefficiencies of markets, such as the existance of equity mispricing, that allow them to capitalize on equity securities mispricing (Erenburg, Smith, & Smith, 2011).

The literature on postearnings announcement drift suggest that companies with earnings reports that reflect better than expected results experienced prolonged abnormal stock price performance following such announcements and vice versa (Chung & Hrazdil, 2011). In most cases, arbitrators tend to underreact to better or worse than expected earnings announcements, rather than taking advantage of related mispricing opportunities (Chung & Hrazdil, 2011). Moreover, markets exhibit weak-form market inefficiency for security prices of firms engaged in fraudulent financial reporting (Erenburg et al., 2011). Although abnormal investor returns were less for highly traded firms' post-announcement than low-traded firms, the existence of postearnings announcement drift indicates a deficiency in market efficiency (Chung & Hrazdil, 2011). The existence of postearnings announcement drift supports the notion of semistrong market efficiency, whereas market mispricing is the result of arbitrator reaction to earning announcements. Equity price changes of individual stocks react with a lag, relative to changes in the overall market, especially for smaller capitalized companies (Wang, Li, & Huang, 2013). Additionally, transaction cost accounts for about 2% of the market efficiency variation (Chung & Hrazdil, 2011). Also, information asymmetry accounts for 16% variation, and investor sophistication accounts for 8% of the variation (Chung & Hrazdil, 2011). Information asymmetry leads investors to rely on the *wisdom of crowds* to infer managements' perceptions of value-creation potential (Schijven & Hitt, 2012). Sewell (2012) rejected the market efficiency theory based on four different statistical tests and testing market data based on daily, weekly, monthly, and annual intervals. Sewell (2012) found that period market returns were inconsistent with market efficiency and that market participants appear to have no observable long-term memory of stock returns that are consistent with the notion of market efficiency. The existence of equity price lags and information asymmetry supports the notion of semistrong market efficiency.

Although mature markets, at times, exhibit weak-form market efficiency, in U.S. equity markets positive excess returns have declined substantially over the past 20 years (Lim & Brooks, 2011). Declining positive excess returns dispute the notion of weak-form market efficiency. A perfectly efficient market would eliminate the possibility of investors outperforming the market over the long-term (Mirzaee Ghazani & Khalili Araghi, 2014). Equity market inefficiencies, such as price appreciation associated with stock splits, negate the strong-form efficient market hypothesis (S. J. Brown, 2011). Therefore, the perspective of semistrong market efficiency was the prevailing market dynamic prominent throughout this study.

Book Value to Market Value

The relationship between the book value of equity and the market value of equity is one of the most studied capital market phenomena (Asness et al., 2013). Investment analysts use the market value of equity via book value multiples to assess the under- or overvaluation of company stock prices (Damodaran, 2012). Higher multiple stocks correspond to higher average returns compared to lower multiple stocks (Fama & French, 2012). Similarly, the ratio of market value to book value correlates to future financial performance (Vayanos & Woolley, 2013). The gap between book value and market value may relate to value relevant, nonfinancial information (Patatoukas, 2014). Intrinsically, future financial performance fundamentally relates to firm value (Heinrichs et al., 2013). Relative valuation methodologies include price-to-book multiples as a guidance tool of derived company value (Gleason, Bruce Johnson, & Li, 2013). Similarly, RIM valuation models include book value as the foundation for market value estimation (Phansawadhi, 2013). The interrelationship between book value and market value is a preponderant theory that influenced this study.

Cost of Equity Capital and the Capital Asset Pricing Model

The cost of capital refers to the cost of financing the firm (Callahan, Smith, & Wheeler Spencer, 2012). Theses costs include equity capital, debt financing, and hybrid capital financing as preferred stock (Schulze, Skiera, & Wiesel, 2012). The components of cost of capital used in business valuation depend on the purpose of the valuation and the valuation methodology (Mohanram & Gode, 2013). Equity valuation models such as the dividend discount model and the residual income model use the cost of equity as the discount rate. Discounted cash flow valuation models, adjusted present value model, and functional business valuation use a weighted average cost of capital (Damodaran, 2012). For merger and acquisition purposes, the valuation of a target company requires the use of the target company's cost of capital that reflects the riskiness of the target company (Ma, Whidbee, & Zhang, 2011). Scenario analysis valuations of potential M&A, where projected cash flows and earnings reflect merger synergy use a combined weighted average cost of capital (WACC) of the acquirer firm and target companies. The WACC is a topic examined further in this study.

An examination of the Gordon and Gould (1978) review of past studies of the cost of equity capital provides a foundation for the topic of cost of capital. Gordon and Gould (1978) posited a wide acceptance of the notion that the firm cost of equity capital is equal to the investors' expected yield for the firm's common equity. Past research supports the idea that future dividends reflect future returns on company internal investment activities. Past studies also recognized the need to include end-of-period wealth creation in the estimation of the cost of equity (Gordon & Gould, 1978). However, Gordon and Gould (1978) argued that end-of-period wealth creation is less important than multi-period consumption utility associated with dividend payments. Gordon and Gould (1978) deduced that simplified investment models developed in the prior literature are less than adequate in determining the cost of equity capital, due to several limitations. The limitations include an assumed capital structure and an assumed internal return on investments. Earlier examinations of the cost of equity led to inclusions of variables such as corporate and personal taxes and inflation, as reflected in the following equation.

$$\mathbf{k} = \frac{[(\mathbf{1}-\boldsymbol{\theta})(\mathbf{1}-\mathbf{b})\mathbf{y}]}{\mathbf{q}} + (\mathbf{1}-\mathbf{c})(\mathbf{br} + \boldsymbol{\pi}) \qquad (1)$$

Where,

k = stock yield, net of personal taxes,

θ = personal income tax rate,

b = the fraction of earnings on equity being retained,

y = the expected after-tax return on equity as a measurement of the ratio of earnings on equity, net of corporate taxes,

c = tax rate on capital gains,

q = the ratio of the market value of equity to its replacement cost,

r = the expected rate of return on equity investment, and

π = the expected rate of inflation.

Easton, Taylor, Shroff, and Sougiannis (2002) followed a similar reasoning that the cost of equity reflects expected future dividends. Easton et al. (2002) examined actual returns on equity investments versus estimated returns, using dividend and earnings growth rates to determine equity premiums. Easton et al. (2002) found that equity premiums averaged 5.3%. Equity premiums are risk yields in excess of the risk-free rates, where expected market returns, less the risk-free rates, equal equity premiums. Risk-free rates in the U.S. correlate with federal budget deficits, the Federal Reserve Bank's discount rate, and U.S. currency foreign exchange rates (Jerry Ho et al., 2011). Jerry Ho et al. (2011) further noted the influence of expected market returns on equity investments, due to country risk, industrial structure, and macroeconomic factors. Fama and French (2002) used market return data of the Standard and Poor's (S&P) index for the period 1872 through 2000 and determined an average real equity return of 8.81%, per annum. Alternatively, Easton et al. (2002) used a more narrow market, Dow Jones

Industrial stocks from 1981 through 1998, and found an average expected rate of return on equity, ranging from 11% to 16%. Boudreaux, Rao, and Das (2014) determined that the average common equity returns on U.S. stocks between 1926 and 2004 had a 12.29% arithmetic mean and 10.43% geometric mean.

In determining a market risk premium, Fama and French (2002) used an average of the six-month commercial paper rates for the same period as the risk-free rate. However, Easton et al. (2002) used the yield on five-year U.S. Treasury Bonds as proxies for the risk-free rate. Earlier estimations of the average annual spread of 5.57% on equity returns above the risk-free rates appeared to be over-large, according to Fama and French (2002). With a narrowed time horizon to reflect market equity return data from 1951 to 2000, Fama and French (2002) concluded that the actual market premiums ranged between 2.55% and 4.32%. Fama and French (2002) risk premium finding was lower than their earlier estimate of average return premium of 5.57%. As such, the average real market returns, as previously cited by market analyst, had been historically overvalued (Fama & French, 2002). Other studies determined that average market equity premiums were between 5.3% to 6.6% above the risk-free rate (e.g., Fitzgerald, Gray, Hall, & Jeyaraj (2013); Maheu, McCurdy, & Zhao, 2013). Damodaran (2012) contended that, because market risk premiums reflect macroeconomic conditions, risk premiums increase during recessionary business cycles and decrease during periods of economic expansion.

In the mid-1960s, Treynor, Lintner, and Sharpe were first to introduce the CAPM. For contributing CAPM, Sharpe received the Nobel Prize in 1990 (Fama & French, 2004). The components of the CAPM are the risk-free rate, levered beta coefficient, and the market rate of return (Winker, Lyra, & Sharpe, 2011). Fundamentally, the CAPM asserts that asset risk relates to a market portfolio of financial assets (Festel, Wuermseher, & Cattaneo, 2013). The CAPM assumes investors seek mean-variance efficient portfolios as an implicitly expected utility maximization (Markowitz, 2014). As such, a key assumption of the CAPM is that investors optimally seek equity investments of low volatility and high return (Markowitz, 2014). The CAPM postulates a positive relationship between investor demands for stock returns and firm systematic risk, where riskier firms have a correspondingly higher cost of capital (Toms, 2010).

The introduction of alternate cost of equity models is in response to perceived deficiencies in the CAPM. The arbitrage pricing model, multifactor model, alternative distributions, and proxy models all attempt to estimate expected return on equity investments (Damodaran, 2012). The CAPM is the prevailing cost of equity method used by professional valuators, because of its accuracy and ease of use (Al Mutairi, Tian, Hasan, & Tan, 2012). Therefore, the CAPM was the cost of equity model used in this study. This study also included a further examination of stock beta coefficients, as a component of the CAPM. An example of the Sharpe-Lintner CAPM equation format is as follows.

$$\boldsymbol{E(R_i) = R_f + \beta_{i_M}(E(R_m) - R_f)} \qquad \textbf{(2)}$$

Where,

$E(R_i)$ = the expected return of any asset i,

R_f = the risk-free rate,

$E(R_m)$ = the expected return on the broader market, and

β_{iM} = beta coefficient of an asset(i) relative to the market

The Sharpe-Lintner CAPM implies three key assumptions. The key assumptions of the CAPM are an inability to short-sale capital assets, unrestricted risk-free borrowing, and that all investors agree inherently to a joint distribution of asset returns (Fama & French, 2004). However, all three key assumptions are often unrealistic in the real world of investing (Fama & French, 2004). Moreover, the assumption that the beta coefficients capture all notions of asset risk is a dubious assumption (Fama & French, 2004). The beta assumptions have led some valuation analysts to use a modified capital asset pricing model (MCAPM). The MCAPM is where a risk premium for a small size company and a risk premium for unsystematic risk are premiums added to the CAPM (Hitchner, 2011).

Past cross-section regression tests of the CAPM model found that the intercept was greater than the risk-free rate of the one-month Treasury bills rate. Moreover, the cross-section regression tests found that the beta coefficient was less than the average excess market return (Fama & French, 2004). The Sharpe-Lintner CAPM model results in investment returns on low beta portfolios being too high, while returns on high beta portfolios are too low (Fama & French, 2004). Fama and French (2004) argued in favor of their previously introduced *three-factor model* for expected equity portfolio returns, rather than the CAPM. Below is a representation of the three-factor model.

$$\mathbf{E(R_{it}) - R_{ft} = \beta_{iM}[E(R_{Mt}) - R_{ft}] + \beta_{is}E(SMB_t) + \beta_{ih}E(HML_t)} \quad (3)$$

Where,

$E(R_{it})$ = the expected return of any asset i at time t,

R_{ft} = the risk-free rate at time t,

β_{iM} = the beta coefficient of an asset i relative to the market,

$E(R_{Mt})$ = expected market return,

β_{is} and β_{ih} = betas as slopes of multiple regressions of estimated asset and market returns, respectively, for SMB_t and HML_t,

SMB_t = small minus big, being the difference between the returns of a diversified portfolio of small and big market capitalization stocks, and

HML_t, = high minus low, being the difference between the returns of a diversified portfolio of high and low book value to market value stocks.

Although students of finance continue to learn about the CAPM, the three-factor model of expected return estimation is a more accurate model in determining the cost of equity (Fama & French, 2004). The three-factor model imbues an equity risk premium, a size premium based on market capitalization, and a value premium derived from the book equity to market capitalization ratio to infer the cost of equity. However, Penman (2011), opposed the merits of the three-factor model for the cost of equity estimation, because two of the three factors (size factor and book-to-price factor) do not explain fundamental risk. According to Penman (2011), two of the three factors are simply correlated factors, not necessarily causation factors.

Penman (2011) took exception to the CAPM as a valid measure of equity cos,t due to its assumption that equity returns follow a bell-shaped normal distribution, while actual historical returns do not follow a bell-shaped normal distribution. Moreover, beta estimations used in the CAPM are expected covariances of the future, based on past observations that assume constant covariances (Penman, 2011). Moreover, since betas are time-varying, any correlation between future covariances and past covariances may merely reflect random linearity (Penman, 2011). The notion that market risk premiums used in the CAPM reflect all individual investors or firms' tolerance for risk is disputable, because risk tolerance varies between investors (Penman, 2011). Likewise, the likelihood of a loss is a greater concern for investors than the risk of excess returns (Chong & Phillips, 2012).

Furthermore, market risk premiums do not account for the inverse relationship between investor expected return on equity and company allied probability of default (Garlappi & Yan, 2011). Additionally, the fundamental concept of the CAPM is that it represents an estimation of expected investor returns, rather than being based on actual returns relating to investor behaviors (Michelfelder et al., 2013). As such, expected returns on equity investments do not adequately correlate to CAPM betas, but rather correlate with multifactor betas (Cochrane, 2011). Deriving a relative discount rate by looking at average returns of similar securities and firm values based on firm characteristics may produce inaccurate discount rates (Cochrane, 2011).

Recent studies of the CAPM revealed several anomalies, such as when portfolios constructed via various firm characteristics earn different average returns from those estimated using the CAPM approach (Da, Guo, & Jagannathan, 2012). Other anomalies occur, due to firm size and book-to-market effects (Da et al., 2012), as discovered by Fama and French (2004). However, such anomalies should not negate the usefulness of CAPM as an estimator of the cost of capital for project analysis (Da et al., 2012). A firm's real option to modify or abandon existing projects is key in explaining the poor performance of the CAPM as an estimator of the cost of equity (Da et al., 2012). However, the CAPM reasonably estimates stock returns when option-adjusted (Da et al., 2012). The CAPM remains a valid measurement of investor risk. Consequently, it is used widely by academics and practitioners (P. Brown & Walter, 2013).

The interaction between imperfect competition and asymmetric information increases the cost of equity, as equity investors demand higher returns relative to associated risks (Lambert et al., 2012). Risk related to imperfect competition and asymmetric information is not part of CAPM. Similarly, the single beta coefficient used in the CAPM may not simultaneously reflect the risk of loss and risk of excess upside returns that reflect accurately investor expected returns (Chong & Phillips, 2012). Partial government ownership is another variable that affects the cost of equity but is often not encompassed in the CAPM. Moreover, minority state ownership may increase firm equity risk, due to political orientations that diverge from business goals and objectives (Ben-Nasr, Boubakri, & Cosset, 2012). The CAPM does not capture risks associated with minority state ownership. Lack of marketability and liquidity of small capitalization stocks and private company stocks prompt equity investors' requirement for expected return premiums (Comment, 2012). Although expected return premiums are not part of CAPM, they account for 20% to 40% of the value of restricted market stocks (Comment, 2012). Notwithstanding its many shortcomings, the CAPM remains the preferred approach to cost of equity estimation by eminent authors and academics (Damodaran, 2012; Fernández, 2007; Koller et al., 2010). As such, the CAPM was the prevailing cost of equity estimator used in this study.

An alternative model for estimating the cost of equity is the modified dividend discount model. The modified dividend discount model uses current market-derived price per share, anticipated dividend per share, and a constant growth assumption to determine the cost of equity (S. Norman et al., 2013). The CAPM uses a market risk premium as an assumption of investor risk and growth estimations. Conversely, the dividend discount model uses a constant growth assumption as an estimation of firm growth (Ross, Westerfield, & Jaffe, 2010). Both assumptions lead to measurement errors, but the risk premium measurement errors of the CAPM assumptions are less impactful than the measurement errors of the growth assumptions in the DDM (Ross et al., 2010). The formulaic expression of the single stage DDM formula is as follows.

$$\mathbf{k_e} = \left(\frac{\mathbf{d_{t+1}}}{\mathbf{P}}\right) + \mathbf{g} \tag{4}$$

Where,

k_e *= cost of equity,*

d_{t+1} *= next period expected dividend,*

P = current stock price, and

g = constant dividend growth rate assumption.

An alternative method of deriving growth is where growth = retention ratio x ROE, where the *retention ratio* is the ratio of retained earnings to total earnings, and ROE is the return on equity.

The *intertemporal consumption model*, as used by economists, accounts for the substitution effect for consumption under budget constraints. An intertemporal consumption model may also explain investor savings and investing choices in a dividend paying common stock, and thus estimate expected investor returns (S. Norman et al., 2013). The DDM, as derived by the intertemporal consumption model, is an estimator of the cost of equity but may require modifications (S. Norman et al., 2013). A simple extension of the DDM integrates investment and consumption variables. Those investment and consumption variables reflect investors' willingness to forgo consumption in favor of investment under budget constraints and expected return on investment (S. Norman et al., 2013).

An alternative model for estimating the cost of equity capital is the accounting-based residual income model (Phansawadhi, 2013). Fundamentally, the cost of equity capital of assets should reflect related asset profitability and changes in asset market price (Phansawadhi, 2013). Discount rates used in company valuation models integrate cost variables, such as the cost of equity, the cost of debt, and hybrid costs of financing. The RIM valuation model is a discounted cash flow methodology that uses accounting variables such as book value, net income, and earnings to determine the relative value of a company's equity (Phansawadhi, 2013). A formulaic expression of the RIM as used to tabulate the cost of equity of a private firm is as follows (Phansawadhi, 2013).

$$\mathbf{K_t} = \frac{\mathbf{NI_t}}{\mathbf{BV_{t-1}}} \tag{5}$$

Where,

K_t = *a private firm's cost of equity at period t,*

NI_t = *total net income for period t, and*

BV_{t-1} = *total book value for period t – 1.*

A formulaic expression employing the estimated cost of equity in an intrinsic valuation model is as follows (Phansawadhi, 2013).

$$W_t = (1 + K_t)(1 + K_{t-1})(\ldots)(1 + K_2)(1 + K_1)*B_O \tag{6}$$

Where,

Wt = current intrinsic value of the firm at current period t = T,

K_t = *a private firm's cost of equity at period t, and*

Bo = book value of firm at period t = 0.

The derived cost of equity estimation model allows for a determination of cost of equity for private firms that mirror the firms' return on equity (Phansawadhi, 2013).

The capital indifference proposition of Modigliani and Miller (1958) regarding the cost of capital may hold true for financial services firms, since investors expect and accept such firms to maintain relatively high levels of financial leverage. However, debt used to finance loan portfolios may include additional cost of debt risk premiums, regardless of the firms' financial leverage. Components of the cost of capital addressed in this study relate to financing costs associated with operating assets, but not portfolio assets. Lenders that provide debt financing to financial services companies in support of portfolio assets may forgo leverage risk premiums, but add portfolio risk premiums.

Beta coefficients. A beta coefficient (β) is a historical measurement of covariance of the market price of a firm's issued security, relative to the covariance of the price of a market portfolio of similar type securities (Ross et al., 2010). Beta is a measure of market risk that correlates volatility of the firm's stock yield to volatility of the broader market yield. The β is the slope of the regression, or regression coefficient, of the returns of a security and market returns (Fama & French, 1996). Market returns are often synonomous with the S&P 500 index (Riedl & Serafeim, 2011). In the case of multi-national companies' securities, the Morgan Stanley Capital International World Index represents market returns (Koller et al., 2010). Linear regression analysis is used to measure the relationship between a firm's stock and the price of a market portfolio. Regression analysis yields a coefficient of determination R^2 that reflects the percentage prediction of the variation in one variable relative to another variable (Boslaugh, 2013). The following is a formulaic presentation of a security's beta coefficient.

$$\textit{Beta of a security } i = \frac{Cov\ (\boldsymbol{R_i}, \boldsymbol{R_M})}{Var(\boldsymbol{R_m})} \tag{7}$$

Where,

Cov = covariance,

R_i *= return on security i using T observations,*

R_M *= return on security a market portfolio using T observations, and*

Var = variance.

Fama and French (1996) challenged the adequacy of the CAPM as a measurement of a stock's return, due to its implication that beta is the only risk factor explaining expected returns of securities. Fama and French (1996) also challenged the notion of the CAPM that a positive relationship exists between β and expected returns. Nonbeta variables, such as earnings to price ratio, cash flow to price, book equity to market equity, and past sales growth, significantly explain average returns (Fama & French, 1996). Observed inverse correlations between economy-wide risk and future stock returns help explain investor expectations, based on the relative degree of systemic risk vis-à-vis the economy (Lyle, Callen, & Elliott, 2013). Looking beyond systemic risk, Fama and French (1996) argued that the mean-variance-efficient true market notion that β explains expected returns is false, thus necessitating consideration of firm-specific performance measures as adjustments to regression betas. In a related argument, Cochrane (2011) advanced the notion that long-run betas are cash flow betas, since long-run equity return uncertainty correlates with the uncertainty of future expected cash flows. Moreover, a cross-section of average stock returns does not correspond to market betas (Cochrane, 2011). As such, Cochrane (2011) posited a long-run price-and-payoff perspective of betas, rather than focusing on short-term returns.

Holthausen and Zmijewski (2012) investigated adjustments to cost of equity capital estimations for differences in financial leverage. The derived discount rate used in DCF valuation methods requires the use of beta coefficients in the determination of cost of equity (Holthausen & Zmijewski, 2012). DCF valuations often begin with a determination of comparable company and subject company unlevered betas. Unlevered betas are then re-levered to reflect the firms' financial leverage and related interest tax shield (Holthausen & Zmijewski, 2012). The formula for levering β_U is a follows.

$$\beta_L = \beta_U(1 + ((1 - t)D/E)) \quad (8)$$

Where,

β_L = *levered equity beta,*

β_U = *unlevered equity beta,*

t = *tax rate,*

D = *market value of firm debt, and*

E = *market value of firm equity.*

Rather than starting with a firm determined regression beta, 85% of valuation practitioners estimate an asset beta β_A using comparable companies (Bancel & Mittoo, 2012). Comparable companies' asset beta is a surrogate unlevered beta for the firm (Grüninger & Kind, 2013). The asset beta β_A requires levering transformation into a firm-specific beta β_E similar to an unlevered beta β_U transformation to a levered beta β_L (Damodaran, 2012).

According to Holthausen and Zmijewski (2012), valuation practitioners often assume zero betas for debt, preferred stock, and other noncommon stock components of capital. The general form of leveraging the cost of capital are upward adjustments to the company's unlevered cost of capital that reflects financing leverage associated with debt and preferred financing, argued Holthausen and Zmijewski (2012). In this way, Holthausen and Zmijewski (2012) concluded the need for valuators to estimate betas for debt and preferred stock, rather than assuming zero betas.

Grüninger and Kind (2013) advocated using a comparable unlevered asset beta rather than a regression unlevered asset beta, then transforming the unlevered beta into a company-specific beta based on company leverage. The formula of beta transformation is as follows.

$$\beta_E = \beta_A + L/(1 - L)x(\beta_A - \beta_D) \quad (9)$$

Where,

β_E *= company-specific equity beta,*

β_A *= comparable companies' asset beta,*

L = leverage ratio of market value of debt to enterprise value (D+E), and

$\beta_D = (r_d - r_f)/RP$*, where* r_d *equals the pretax cost of debt, and* r_f *is the risk-free rate, and RP equals the market risk premium over the risk-free rate.*

The calculated equity beta β_E or levered beta β_L is essential for the CAPM in determining the company-specific cost of equity (Grüninger & Kind, 2013). However, one cannot derive beta coefficients for new ventures from historical experience or from peer groups, because peers do not exist for certain high-tech start-ups (Festel et al., 2013). As such, beta coefficients of firms with similar characteristic are proxies for the unknown β_A.

The cost of debt. The cost of debt refers to the interest rate charged for debt financing of short-term and long-term bank financing or issuance of bonds, as applicable. Unlike equity financing, debt financing provides companies with a tax shield via interest expense deductibility (Dempsey, 2013). The tax shield allied with debt financing increases firm value through increased cash flows available to debt and equity claimants (Barbi, 2012). The formulaic representation of the after-tax cost of debt, as used in the WACC, is as follows.

$$\textit{After-tax cost of debt} = \mathbf{k_d(1 - T)} \quad (10)$$

Where,

kd = the firm's marginal interest rate on new debt financing, and

T = the firm's marginal federal-plus-state *tax rate.*

According to Holthausen and Zmijewski (2012), a method for measuring the value of the interest tax shield is the adjusted present value (APV) valuation method. A formulaic expression of the value of debt-related tax shield is as follows.

$$\mathbf{V_{ITS,1} = \sum_{t=1}^{\infty} \frac{r_{D,t} \text{ x } V_{D,t} \text{ x } T}{(1+ r_{ITS})^t}} \quad (11)$$

Where,

$V_{ITS,1}$ = *value of interest tax shield at time 1,*

$r_{D,t}$ = *cost of debt at time t,*

$V_{D,t}$ = *value of debt at time t,*

T = marginal tax rate, and

r_{ITS} = *risk of the tax shield or expected return on the tax shield.*

Valuation practitioners often make incorrect estimations of the cost of debt. An incorrect cost of debt assumption is that debt betas are equal to zero (Grüninger & Kind, 2013; Holthausen & Zmijewski, 2012). Another incorrect cost of debt assumption is that future debt levels remain fixed (Oded et al., 2011). Most firms periodically rebalance debt levels to achieve targeted capital structures (Oded et al., 2011). As such, valuation practitioners can avoid engendering marginal cost of debt determination errors by presupposing that firm debt levels increase, relative to expected firm growth (Dempsey, 2013). Firms with constant leverage ratio policies can determine the value of future tax shields as a growing perpetuity using the following formula.

$$\mathbf{V_{ITS,t} = \frac{rTD_t}{k_u - g} \ x \ \frac{1 + k_u}{1 + r}} \qquad (12)$$

Where,

$V_{ITS,t}$ *= value of interest tax shield into perpetuity at time t,*

r = cost of debt

D = debt at time t,

k_u *= unlevered cost of capital,*

T = corporate tax rate, and

g = expected growth rate.

An important but often overlooked matter in the determination of the cost of debt is the choice of a corporate tax rate. Financial managers seek a level of debt where marginal benefits of the interest tax shield equal the marginal cost of debt financing (Abd Halim & Nur Adiana Hiau, 2013). As such, a marginal corporate tax rate suffices in accomplishing a marginal analysis. However, firms experiencing high abnormal growth often exhibit increasing deferred tax liabilities that result in divergence between effective tax rates and marginal tax rates (Graham, Raedy, & Shackelford, 2012). Therefore, firms facing high growth periods or net operating losses should employ effective tax rates for the cost of debt calculations for preterminal value period valuations (Damodaran, 2010). Another over-looked concern of equity investors is the impact that debt levels have on default risk that influences equity values (Garlappi & Yan, 2011). A hump-shaped relationship exists between equity risk and the probability of default (Garlappi & Yan, 2011). Asset pricing models such as the CAPM should include risk premiums relating financial leverage to investor required returns that accurately capture financial leverage risk (Garlappi & Yan, 2011).

Valuation practitioners commonly assume debt betas equal to zero (Holthausen & Zmijewski, 2012). An assumption of zero debt betas may cause an unjustifiably high cost of equity and related WACC that may lead to an undervaluation of firms (Holthausen & Zmijewski, 2012). Only 18% of the valuation practitioners surveyed affirmed consideration of debt betas when de-levering betas (Bancel & Mittoo, 2012). Similar to equity betas, debt betas are a measure of market risk, otherwise known as undiversifiable risk. An assumption of a zero debt beta will lead to a correct WACC, only under a dubious assumption of debt risk premiums of zero (Grüninger & Kind, 2013). Valuation practitioners may avoid the zero debt beta issue by assuming a risk-free interest rate of the cost of capital (Grüninger & Kind, 2013). Alternatively, valuation practitioners may estimate debt betas within a range of 0 to 0.30, as espoused by Oded et al. (2011) and Chrysafis (2012). Similarly, practitioners may use regression analysis to determine debt betas based on the sensitivity of rated corporate debt to market changes of equity prices (Chrysafis, 2012).

Capital structure. Capital structure refers to a firm's chosen mix of debt and equity financing that may include hybrid financing, such as preferred stock (Ross et al., 2010). Firms effect changes in capital structure by increasing or decreasing one or more capital structure components, relative to the other components. For example, repurchasing outstanding common stock with borrowed funds simultaneously increases debt and decreases common equity, causing an increase in firm financial leverage (Bonaimé, Öztekin, & Warr, 2014).

In their seminal work, Modigliani and Miller (1958) advanced the notion that the cost of capital is a function of all sources of firm capital. However, according to Modigliani and Miller (1958), the market value of any firm is independent of its capital structure. Modigliani and Miller (1958) departed from economic theorists' assumption that the cost of capital is simply the rate of interest on bonds. Any increase in the cost of debt resulting from increased financial leverage is offset by a corresponding reduction in the cost of equity (Modigliani & Miller, 1958). Stretcher and Johnson (2011) noted that many of the assumptions made by Modigliani and Miller regarding taxes and risk structures are unrealistic for most organizations. Moreover, the earlier conclusion of Modigliani and Miller (1958), that no optimal capital structure exists that leads to maximizing firm value, has since been rebutted in academic literature.

Changes in a company's capital structure may influence the cost of capital. Brusov, Filatova, and Orekhova (2013) found that changes in financial leverage cause variations in the cost of equity for firms with finite horizons. Brusov et al. (2013) argued that changes in capital structure matter in the short-term. Conversely, Koller et al. (2010) concluded that the irrelevance proposition that capital structure does not impact long-term firm value holds true. Graham and Leary (2011) found recent evidence that the choice of a capital structure had only a modest effect on firm value. The notion of capital structure irrelevance was further advanced by Ross et al. (2010), who argued that changes in firm leverage add insignificantly to enterprise value. However, targeted financial leverage remains an important component of capital structure theory (Hovakimian & Li, 2011). Intrinsically, debt levels are a key determinant of capital structure adjustment activities, due to the tax shield associated with debt. Capital structure modifications relating to increases in financial leverage led to firms recognizing a small increase in firm value (DeAngelo & Roll, 2015). Changes in capital structure occur as some companies take advantage of lumpy investment projects as opportunities to adjust capital structure at low marginal cost (Dudley, 2012). As firms undertake intense investment activities, they may elect to re-lever or de-lever, based on the life cycle of project investments (Dudley, 2012).

Contrary to the findings of Modigliani and Miller (1958), further research has not led to a consensus of an optimal capital structure (van Binsbergen, Graham, & Yang, 2011). Some researchers supported the notion that excess debt increases the risk of financial distress (van Binsbergen et al., 2011). Other researchers argued that all debt relating to positive net present value projects created firm value (van Binsbergen et al., 2011). The choice of capital structure affects investment risk and the financial impact and timing of interest tax shields relating to debt financing (Holthausen & Zmijewski, 2012). The value of debt requires an inclusion of all related benefits and detriments (van Binsbergen et al., 2011).

Benefits of debt include related tax benefits, while detriments of debt include the cost of default and debt related agency cost (van Binsbergen et al., 2011). van Binsbergen et al. (2011) used an economist notion of marginal benefit versus marginal cost analysis in analyzing an optimal debt level. van Binsbergen et al. (2011) argued that an optimal debt level for firms is where marginal costs intersect with marginal benefits of debt. Consequently, companies that deviate from the equilibrium of marginal cost equal marginal benefit reduce firm value (van Binsbergen et al., 2011). Too little debt reduces firm value relating to lost tax shield benefits, while too much debt reduces firm value due to default risk and volatile earnings associated with operating leverage (Stretcher & Johnson, 2011).

Fluctuating enterprise value is an impetus for many businesses to rebalance debt to maintain a fixed debt-to-equity ratio (Oded et al., 2011). Financial managers may elect to modify the firm's capital structure through stock repurchases. Motivations for share repurchases include efforts to: reduce agency costs associated with excess cash balances, decrease stock under-value signaling, impede takeover attempts, and undertake industry peer mimicking (Bonaimé et al., 2014). Share repurchasing alters a firm's capital structure by reducing the number of shares outstanding, relative to debt levels, thereby increasing firm financial leverage (Bonaimé et al., 2014). Firms may be motivated to repurchase shares of undervalued stock, if such actions enable firms to exploit market mispricing (Bonaimé et al., 2014).

The foundation of the Modigliani and Miller (1958) capital structure indifference is that, in the absence of taxes, a firm cannot reduce its overall cost of capital (Ross et al., 2010). The theory of capital indifference hypothesizes that a company cannot reduce its cost of capital, because debt is a substitute for equity (Ross et al., 2010). According to Ross et al. (2010), numerous studies support the notion of capital structure indifference advanced by Modigliani and Miller (1958). Accordingly, capital structure management is more efficient in preventing value destruction than increasing firm value creation (Koller et al., 2010). However, firms can increase value equal to the tax shield related to debt, as long as the amount of financial leverage does not lead to excess default risk premiums (Stretcher & Johnson, 2011). Conversely, Koller et al. (2010) argued that no optimal capital structure exists that creates firm value. Key benefits derived from financial leverage lead to detriments of increased costs associated with business erosion and agency cost (Koller et al., 2010). Using the weighted average cost of capital, future examinations of optional capital structures might lead to finding of an optimal capital structure for companies.

Weighted Average Cost of Capital.

The weighted average cost of capital (WACC) is the sum of the weighted cost of capital components of a firm. The WACC is the discount rate used for project analysis and company valuations. Components of WACC depend on the components of firm capital structure, but may include the cost of equity, debt, hybrid financing, and other less common forms of capital, such as financial derivatives. This study focused on the cost of capital components of cost of common equity and cost of debt financing. Thus, an in-depth investigation of all other forms of capital financing was beyond the scope of this study.

The WACC is a firm-specific discount rate used in discounting future expected cash flows (Grüninger & Kind, 2013) in capital budgeting and firm valuation. The WACC is a cost of capital formulation that weights each cost component of debt and equity (Donovan & Nuñez, 2012). The weights of the cost of debt and cost of equity should relate to the anticipated firm capital structure and marginal tax rate (Grüninger & Kind, 2013). The WACC is used to discount expected future cash flows attributed to a firm or a firm's projects (Grüninger & Kind, 2013). However, the WACC is not the cost of capital used in equity valuations (Ross et al., 2010). The after-tax WACC formula for firms with one type of common equity and debt financing is as follows.

$$WACC = r_e (1 - L) + r_d (1 - T_c) \times L \quad (13)$$

Where,

r_e = *cost of equity,*

L = *Leverage ratio of market value of debt to enterprise value (D+E),*

rd = pretax cost of debt (at the given level of financial leverage), and

T_c = *corporate tax rate.*

The WACC formula implies a preference for financial leverage, due to the tax shield associated with interest expense, where lower tax payments create firm value (Stretcher & Johnson, 2011). Stretcher and Johnson (2011) concluded that an optimal level of leverage exists at a point where the WACC is at its lowest possible value. However, according to Al Mutairi et al. (2012), most financial officers do not have a preference of financing options for new projects and thus do not seek to minimize firm

WACC. In cases where DCF valuations are a precursor to a leveraged buy-out or some other activity that changes the leverage position of the firm, Larkin (2011) argued in favor of modifying the firm's WACC accordingly. Finance scholars often modify a firm's WACC for valuation purposes, in order to account for real-world expectations of the balance sheet leverage ex-ante (Larkin, 2011).

In their examination of the WACC, Grüninger and Kind (2013) noted the presence of an inner inconsistency in the WACC formula. The inconsistency is that the WACC assumes a debt beta of zero, while simultaneously assuming a cost of debt in excess of the risk-free rate. Grüninger and Kind (2013) challenged the contemporary acceptance of WACC accuracy, by claiming that the assumption of zero debt betas is inconsistent with the use of debt premiums. Grüninger and Kind (2013) and Holthausen and Zmijewski (2012) argued the validity of the WACC. Grüninger and Kind (2013) and Holthausen and Zmijewski (2012) asserted that a zero debt beta assumption yields a correct cost of capital, only in certain situations. Zero beta yields correct cost of capital is when no corporate taxes exists (Grüninger & Kind, 2013) and where the cost of debt is equal to the risk-free rate (Holthausen & Zmijewski, 2012). The inclusion of corporate taxes creates a slight variation in the WACC that causes bias in valuation results. However, the assumption of a zero debt beta mitigates tax-related bias in valuation (Grüninger & Kind, 2013). The corresponding cost of equity and earlier defined cost of debt are independent variables used in the traditional WACC formula. For valuation practitioners unwilling to undertake re-levering formulation, Grüninger and Kind (2013) recommended the following optional WACC formula.

$$WACC = r_E \, x \, (1 - L) + r_f \, x \, L - (T_c \, x \, r_D \, x \, L) \quad (14)$$

Where,

r_e *= cost of equity,*

L = leverage ratio of market value of debt to enterprise value (D+E),

r_f *= pretax risk-free debt rate,*

T_c *= corporate tax rate, and*

rd = pretax cost of debt (at the given level of financial leverage).

Alternative Measurements of the Cost of Capital.

Estimating the cost of capital is a challenging exercise for firms (Guay, Kothari, & Shu, 2011). Researchers have devised and utilized an implied cost of capital as proxies for expected returns. Of the several implied cost of capital approaches, most valuators use the discounted cash flow valuation models to solve for the cost of capital, based on an assumed firm value (Guay et al., 2011). The notion supporting an implied cost of capital is that expected investor returns relate to financial asset market prices reflecting investor expectations of firm future cash flows and investor consideration of all company and market risk factors. The implied cost of capital formula uses future expected free cash flows to equity, discounted at an internal rate of return (IRR). The correct IRR is one that causes the discounted value of the firm’s equity per share to equal the firm’s current stock price (Hann, Ogneva, & Ozbas, 2013). All new information on company performance is necessary for forecasted future earnings to reflect accurately the implied cost of capital (Hwang, Lee, Lim, & Park, 2013). Conversely, Bae, Kim, and Ni (2013) argued that firm-specific return variation positively correlate to readily accessible soft information, where geographic proximity is a proxy to the ease of obtaining soft information.

IRR Analysis is a financial tool for determining an implied cost of capital, where average rates of return on capital investments exceed the marginal cost of capital (Scherer, 2014). However, according to Scherer (2014), competitive market forces prohibit firms from enjoying long-term excess profits. An absence of long-term excess profits supports the notion that marginal returns on capital do not exceed marginal costs of capital (Scherer, 2014). Exceptions to limited excess returns are supranormal incremental returns on investments relating to the superior productivity of specific inputs (Scherer, 2014). Traditional IRR mathematical methods may cause multiple solutions that are incompatible with a net present value analysis (Magni, 2010). An alternative method of calculating IRR, as espoused by Magni (2010), eliminates the need for existing flows found in traditional IRR analysis. Magni (2010) introduced the notion of an average internal rate of return (AIRR) that addresses deficiencies of the traditional IRR. Net present value analysis (NPV) leads to accepting projects or acquisitions when NPV results are greater than zero, so long as the discount rate of future cash flows is equal to the cost of capital. AIRR uses a market rate of return in the equation, leading to an affirmation when the resulting AIRR is greater than the cost of capital. The fundamental notion of AIRR analysis is that invested funds in a project or acquisition have a cost based on market rates of return on similar investments. Accordingly, Magni (2010) described an AIRR that is analogous to the modified internal rate of return that addresses the issue of multiple IRR through the inclusion of a reinvestment rate.

Alternatively, Toms (2010) investigated the link between value theory and accountability via a Resource Value-Resource Risk perspective as an alternative to the CAPM. Resource Value-Resource Risk of a firm attributes asset value to abnormal returns and supports an integrated theory of value, profit, and risk (Toms, 2010). Hou, van Dijk, and Zhang (2012) investigated a model-based implied cost of capital using cash flow estimates for a large sample study. Hou et al. (2012), found that expected stock returns and the cost of equity capital embody firm risk characteristics and thus investor expected returns. As a related topic, value creation is organizational processes that add value to firm assets. Cost control mechanisms and corporate governance influence value creation, as organizational efficiencies reduce costs and enhance profitability (Toms, 2010). Corporate governance affects the firms' cost of capital via dynamic capital structure modeling, influencing relative tax shields, contracting frictions, and agency conflicts (Morellec, Nikolov, & Schurhoff, 2012).

Past studies demonstrate significant deviation of realized returns from expected returns over prolonged periods (Hou et al., 2012). The implied cost of capital is an internal rate of return that equates a firm's stock price to the present value of expected future cash flows (Hou et al., 2012). Use of implied cost of capital as a proxy for expected returns has led to undesirable results. The causes of undesirable results are due to analysts' bias in forecasting and a lack of realistic long-term growth rate estimates (Hou et al., 2012). A lack of historical performance data of distressed companies also contributes to undesirable implied cost of capital-related results (Hou et al., 2012).

Accordingly, Hou et al. (2012) suggested a new approach to estimating the implied cost of capital by using cross-sectional models for earnings forecast, rather than a forecast of proxy cash flows. Comparably, Sanginario (2013) advanced the notion of unsystematic or company-specific risk, also known as idiosyncratic risk, as fundamental drivers of additional risk premiums. Determination of the cost of capital should include consideration of unsystematic risks (Sanginario, 2013). Unsystematic risk premiums may further include industry-specific risks, such as differences in human capital (Eiling, 2013) and level of industry competitiveness (Gleason et al., 2013).

Growth Rates

Growth is a core driver of firm value creation (Koller et al., 2010). Valuation methodologies incorporate firm growth as a variable of firm value estimation. Regarding firm valuation, abnormal growth rates encompass explicit forecast periods, while steady state growth rate represents post-horizon periods (Jennergren, 2013). Prior research on firm growth indicated a weak relationship between past growth rates and future growth rates (Damodaran, 2010). Most often, growth estimates come from stock analysts who provide future growth assumptions of traded companies as growth in earnings per share (Ashton & Wang, 2013). Otherwise, firm management may provide estimates of future growth. However, such management estimates may reflect bias through overly optimistic growth rates during periods of economic expansion, and overly pessimistic growth rates during periods of market contraction (Damodaran, 2010; Ruback, 2011).

As a method of determining firm growth rates, Penman (2011) introduced an implied growth rate methodology that relies on anticipated growth assumptions of equity market participants, rather than analysts' estimations. Penman (2011) estimated company growth rates by solving for *g* in the formula that follows:

$$\mathbf{MC} = \mathbf{BV_0} + \frac{\mathbf{RE_1}}{\mathbf{1+r}} + \frac{\mathbf{RE_2}}{\mathbf{(1+r)(r-g)}} \tag{15}$$

Where,

MC = market capitalization,

BV_0 = book value balance sheet reported book value at time 0,

*RE_1= residual earnings in the base year, where residual earnings equal net income – (book value * r),*

RE_2= projected residual earnings in year 2,

r = cost of equity, and

g = constant growth rate.

Penman (2011) argued in favor of reverse engineering the market assumption of residual earnings growth rates, rather than speculative growth rate assumptions. The market implicit growth rate is the value of *g* that reconciles the Gordon and Gould growth model to the market price of the firm's common stock per share. Converting residual earnings growth rates to earnings per share growth rates requires solving for earnings using the residual earnings calculation as follows.

$Residual\ Earnings_t$ = Earnings – ($r \times BV_{t-1}$), and comparing $Earnings_t$ to $Earnings_{t-1}$. (16)

Firm growth is an important contributor to firm value, as most valuation methods use a growth rate variable as a key determinant of future revenues, cash flows, earnings, and dividends. However, growth definitions vary among valuation researchers. According to Sellers et al. (2013), industry forecasters and economic forecasters often concentrate on revenue growth models. Revenue growth models may or may not relate to earnings growth, free cash flow to equity growth, or free cash flow to invested capital growth (Sellers et al., 2013). Some analysts use the inflation rate (Hitchner, 2011) or risk-free rate (Damodaran, 2012) as surrogates for the growth rate in perpetuity. Fama and French (2002) relied on earnings growth rates in their determination of equity premiums. Easton et al. (2002) used the rate of growth of residual income as the applicable growth rate for estimating the expected rate of return on equity and firm value. Conversely, Delen, Kuzey, and Uyar (2013) found a strong correlation between asset growth rate and firm performance. Below is a formulaic expression of the sustainable asset growth rate, as espoused by Delen et al. (2013).

$$g = (P - R + \Delta D)/(A - (P - R + \Delta D)) \quad (17)$$

Where,

g = sustainable growth rate,

P = simple plowback,

R = asset retirements,

ΔD = change in debt, and

A = end-of-year gross assets.

Expected rates of return on equity are highly sensitive to assumed growth rates (Easton et al., 2002). The expected rate of return on equity is especially sensitive to the use of assumed growth rates in the determination of terminal values in perpetuity (Sellers et al., 2013). Past studies of estimations of returns merely assume future growth rates, while Easton et al. (2002) estimated growth rates based on market prices, book values, and finite time forecasted future earnings. Easton et al. (2002) used an inverted residual income valuation model to solve for stock growth rates of the Dow Jones Industrial Average (DJIA). Easton et al. (2002) concluded that the average growth rate in annual earnings of the DJIA was 10.1% for the period 1981 through 1998. Easton et al. (2002) concluded that the average annual earnings growth rate of the DJIA was higher than the actual growth in earnings for the S&P 500 index of 7.92%. Simultaneously solving for estimated growth and an estimated return on equity provides a methodology to adjust forecasted future earnings for short time horizons (Easton et al., 2002). Alternatively, an estimate of growth that assumes a constant dividend payout ratio is when growth in earnings equals the firm's retention ratio multiplied by the return on retained earnings (Ross et al., 2010). The following equation is an estimation of earnings growth rate.

g = Retention ratio x Return on retained earnings (ROE) (18)

In the equation, past ROEs are proxies for expected future ROE, where ROE is the ratio of net income to the book value of equity (Ross et al., 2010).

Similarly, Damodaran (2012) posited that expected growth in free cash flows to the firm (FCFF) is equal to the company's return on capital, multiplied by the company's reinvestment rate. The following are formulaic expressions for the return on capital and reinvestment rate.

$$\textbf{Return on Capital} = \frac{EBIT_n\,(1-t)}{BV\ of\ equity_{n-1} + BV\ of\ debt_{n-1} - Cash_{n-1}} \quad (19)$$

$$\textbf{Reinvestment Rate} = \frac{Capital\ expenditures - Depr. + Change\ in\ noncash\ WC}{EBIT(1-t)}$$

(20)

Where,

BV = book value,

Cash = book value of cash and cash equivalents,

Depr. = depreciation,

WC = working capital,

EBIT = earnings before interest and taxes, and

t = effective tax rate

An examination of the fundamentals of a firm is essential in determining future expected growth (Damodaran, 2010). Examining firm fundamentals is especially important where the sources of growth are new investments intended for business expansion and efficiency improvement with existing investments (Damodaran, 2010). The growth model shown below decomposes firm growth into separate growth components (Damodaran, 2010).

$$g = \Delta E/E_{t-1} = ROI_{New,\,t} * (\Delta I/E_{t-1}) + (ROI_{Existing,\,t} - ROI_{Existing,\,t-1})/ROI_{Existing,\,t-1} \quad (19)$$

Where,

g = growth rate,

E = earnings,

ROI = return on investment,

Δ = change, and

I = investment.

The first portion of the equation depicts growth based on new investments, as denoted as $ROI_{New,t}$ while efficiency growth is a function of the second component of the equation. Below is a formulaic representation of the return on invested capital, advanced by Koller et al. (2010).

$$ROIC_t = (Cap\ Ex_t - Depreciation + \Delta WC_t)/EBIT_t(1-t) \quad (20)$$

Where,

Cap Ex_t *= capital expenditures during period t*

Depreciation = book value of depreciation during period t

ΔWC_t *= change in working capital in period t, where working capital noncash current assets, less nondebt current liabilities,*

$EBIT_t$ = earnings before interest and taxes during period t, and

t = applicable tax rate.

Regarding depreciation, as used in the ROIC model, Nezlobin (2012) advocates the use of accrual accounting depreciation rule of replacement cost accounting. Replacement cost accounting is where depreciable assets shown in the balance sheet reflect a value that represents competitive market prices of comparable used equipment (Wu, Wing Chau, Shen, & Yin Shen, 2012). However, the straight-line to salvage value depreciation method is most widely used for book reporting purposes (Wu et al., 2012). Consequently, the straight-line to salvage value depreciation method is the methodology used in this study.

The Gordon growth model for business valuation provides a foundation for the examination of growth rate considerations and options (Sellers et al., 2013). Past research focused on the cost of capital and cash flow estimations used in the Gordon model, but few researchers delved into an extensive analysis of related growth rates (Sellers et al., 2013). Accordingly, valuation analysts should estimate long-term growth rates using macroeconomic factors as a foundation, and then adjust growth rates by specific industry trends (Sellers et al., 2013). Moreover, the growth rates used in the Gordon model are short-term growth rates applied in forecasted periods, followed by perpetual growth rates applied in terminal value calculations (Sellers et al., 2013).

Business Valuation

Firm value creation correlates with operational improvements of the firm that lead to increased earnings (Acharya, Gottschalg, Hahn, & Kehoe, 2013). Intrinsic valuation is the application of mathematical models used to derive asset or income value

(Damodaran, 2010). Intrinsic value is a function of future expected cash flows that undergo discounting at an appropriate interest rate that reflects the riskiness of future cash flows (Damodaran, 2010). The three valuation models most widely used in business and equity valuation are the discounted cash flow model, the dividend discount model, and the residual income model. This study included valuations based on the four valuation models introduced in Section 2.

The value of common equity is the value of all expected future dividends, plus capital appreciation, discounted at an investor's required rate of return (S. Norman et al., 2013; Penman, 2011). Expected constant growth rate valuation models assume a persistent debt to equity ratio. Below is a representation of the formula for a constant growth stock.

$$P = (1 - b)Y/(k - br) \tag{21}$$

Where,

P = present value of the firm's stock,

Y = expected value of the firm's earnings in the coming year,

b = expected value of the firm's investment and retention rate in perpetuity,

r = expected value of the return on investment, and

k = required return or current stock investment yield.

The following is a contemporary version of the Gordon and Gould constant growth model, as noted by Phansawadhi (2013).

$$V_{CE} = \sum_{i=1}^{\infty} D_0 \frac{(1+g)^t}{(1+r)^t} \tag{22}$$

Where,

V_{CE} = value of the firm's common equity,

D_0 = dividend paid at time 0,

g = constant growth rate,

t = expected dividend period, and

r = investor required return.

The Gordon and Gould constant growth model is a component of the multi-stage dividend discount, residual earnings, and discounted cash flow valuation models. Underlying assumptions of the constant growth model are a fixed cost of equity and a fixed future growth rate in perpetuity (Kiechle & Lampenius, 2012). Fundamental assumptions of the constant growth model are constant future price levels and fixed growth levels of invested capital into perpetuity (Kiechle & Lampenius, 2012). However, constant future price levels and fixed growth level assumptions represent unlikely events (Kiechle & Lampenius, 2012). Therefore, modifying the constant growth model with inflation and capital maintenance variables may improve result accuracy (Kiechle & Lampenius, 2012).

Discounted cash flow (DCF) method, dividend discount model (DDM), and residual income model (RIM).

Unlike the DDM and RIM that focus on valuing the firm's common equity, the DCF valuation methodology determines either the value of the firm or the value of the firm's equity. The unlevered cost of equity is an appropriate discount rate for use in the DDM and RIM (Singh, 2013). The levered cost of equity is an applicable discount rate for the DCF equity valuation model (Singh, 2013). However, the WACC is the appropriate discount rate in the DCF valuation model, when valuing the firm (Jennergren, 2013). The value of the firm is the sum of the market value of its debt, plus the market value of nonoperating assets, plus DDM or RIM valuation model results (Koller et al., 2010). The DCF valuation model derives firm value by discounting future expected free cash flows at a discount rate that reflects the company's cost of capital (Cogliati, Paleari, & Vismara, 2011). The WACC is the cost of capital used in DCF model valuations of the firm. The following is a formulaic representation of the multi-stage DCF valuation model, where the first stage represents forecasted period FCFF and the second stage is the terminal period value.

$$V_0 = \sum_{t=1}^{\infty} \frac{FFCF_t}{(1+WACC)^t} + \frac{FFCF_t(1+g)/(WACC-g)}{(1+WACC)^t} + NOA \quad (23)$$

Where,

FFCF = future free cash flows at time t,

WACC = weighted average cost of capital,

g = constant growth rate of FFCF, and

NOA = nonoperating assets.

Future free cash flows are net operating profit, less actual taxes, plus noncash operating expenses, minus investments in invested capital (Reddy et al., 2013). Free cash flows to equity (FCFE) are the sum of noncash expenses, plus increases in debt of other nonequity claims, plus net income (Singh, 2013). Schulze et al. (2012) advocated using customer cash flows, rather than company-level cash flows, as a variation of DCF valuation. Customer cash flows allow managers to determine a customer-based firm valuation, otherwise known as *customer equity* (Schulze et al., 2012).

The consistent capital structure assumption of the DCF method for valuing the firm restricts its use in firm valuation (Singh, 2013). Inconsistent capital structures prohibit a determination of weighted average cost of capital used in DCF valuations (Singh, 2013). Another impediment to using the DFC valuation method is an inability to determine accurately the value of nonoperating assets (Mielcarz & Wnuczak, 2011). Further impediments include an inability to assess future changes in working capital and estimations of future capital expenditures (Reis & Augusto, 2013). One other obstacle in using the DCF model is an inability to differentiate debt and equity from other forms of raised funds (Damodaran, 2010). Accordingly, equity valuation models that do not rely on input variables of nonoperating assets, working capital, capital expenditures, and debt financing are more suitable when lack of transparency negates the use of the DCF valuation model for valuing the firm.

The DCF model determines firm value by discounting future forecasted free cash flows to equity and a terminal value, based on periodic and perpetual growth rates (Damodaran, 2012). Slightly modified versions of the DCF methodology allow for the calculation of the value of the firm’s equity (Heinrichs et al., 2013). The DDM derives firm equity value by discounting future dividends over a forecasted period and terminal period using assumed periodic and perpetual growth rates (Beisland, 2014). The discount rate used in the DDM is the firm’s cost of equity. The RIM derives firm equity value by discounting forecasted residual income and terminal value, using assumed growth rates (Beisland, 2014). The discount rate used in the RIM is the firm’s cost of equity. Under ideal conditions, such as clean surplus accounting, the DDM, RIM, and DCF models should produce equivalent results (Heinrichs et al., 2013).

DDM incorporates a net present value concept for all expected future dividend cash flows discounted at investors required rate of return (S. Norman et al., 2013). The following is a formulaic description of the two-stage DDM.

$$V_p = D_0(1 + g_S)^t/(1 + r)^t + (D_0(1 + g_S)n \times (1 - g_L))/((1 + r)^n \times (r - g_L)) \quad (24)$$

Where,

V_P = *value of the firm's common equity per share,*

D_0 = *dividend paid at time 0,*

g_S = *short-term constant growth rate,*

r = *investor required return,*

t = *time periods of short-term nonconstant growth,*

n = *time periods of long-term constant growth, and*

g_L = *long-term constant growth.*

The multi-stage DDM is a mathematical model used for calculating the value of common equity for both nonconstant and constant growth periods. The first part of the equation is the nonconstant growth period. The second part of the equation is a slightly modified Gordon and Gould constant growth model, used to determine the terminal value of expected future dividends into perpetuity. Reis and Augusto (2013) indicated concern that the perpetuity assumption in the terminal value calculation does not reflect reality. Reis and Augusto (2013) argued that the average life expectancy of firms is 12 years, with a standard deviation of 11 years. Further research should address firm mortality rates and their impact on terminal value calculations (Reis & Augusto, 2013).

The RIM is a tabulation of the current book equity of the firm to the discounted sum of residual income (Phansawadhi, 2013). RIM relates stock prices to firm book value, excess or abnormal earnings, and other value-relevant information (Higgins, 2011). Residual income differs from dividend income. Dividend income represents cash distributions to shareholders. Excess earnings are residual earnings in excess of the cost of equity, where the cost of equity is compensation to shareholders for the opportunity cost of a similar risk investment. The following is a formulaic representation of the multi-stage RIM.

$$V_0 = BV_0 + \sum RI_t/(1 + r)^t + T_n/(1 + r)^{n-t} \quad (25)$$

Where,

V_0 = *value of the firm's common equity,*

BV_0 = *value of the firm's book value at time 0,*

RI_t = *residual income at time t,*

r = *investor required return,*

t = *time periods of short-term nonconstant growth, and*

n = *period of long-term constant growth.*

Residual income is a function of anticipated return on equity, less required rate of return, multiplied by book value at period t + 1, for each subsequent period. Another method of deriving residual income is by subtracting expected net income from the sum of the cost of equity, times beginning shareholder equity for each nonconstant growth period, plus terminal value (Monahan, 2011). The first part of the equation is the nonconstant growth period, and the second part of the equation represents the constant growth period into perpetuity.

RIM input variables based on historical cost accounting may under-estimate firm value under inflationary conditions (Ashton, Peasnell, & Wang, 2011). Similarly, RIM valuation result accuracy is suspect for firms with early stage investments, where returns from such investments occur after a long-term period (Reis & Augusto, 2013). Adjusting for serial correlation in the RIM valuation model improves RIM valuation accuracy (Higgins, 2011).

The inclusion of book value in RIM valuation models supports the notion that firm equity value and firm market value have a causal relationship (Beisland, 2014). The RIM formulation links firm equity value to book value, plus the present value of future residual earnings (Beisland, 2014). Book value becomes more value-relevant than earnings for poor performing firms (Reddy et al., 2013). Theoretically, if all balance sheet items reflect fair market value, the book value of a firm would equal its market value of equity (Beisland, 2014). Similarly, if all balance items underwent residual earnings valuation, forecasted future residual earnings would be zero (Beisland, 2014). As such, the sum of the residual earnings valuation for each balance sheet item would be equal to the firm's market value of equity (Beisland, 2014).

Past studies demonstrated a theoretical equivalence of the DCF, DDM, and RIM valuation models under conditions of clean surplus accounting (Heinrichs et al., 2013). However, implicit application of several valuation models under conditions of dirty surplus accounting may lead to nonequivalent results. Penman and Sougiannis (1998) examined the impact of finite time horizons in valuation, comparing results of the DDM, DCF, and accrual earnings models, such as the RIM. Penman and Sougiannis (1998) concluded that, while the DDM, DCF, and accrual earnings models reach equivalent conclusions with an infinite time horizon, the models yield different results with finite periods. The accrual earnings technique produce results with lower errors rates than the

DDM or DCF for relatively short time horizons (Penman & Sougiannis, 1998). Organizations using a high degree of accounting discretion fared no better in terms of the accuracy of valuation model results than organizations using less accounting discretion (Francis et al., 2000). The discounted abnormal earnings model best correlated with equity market prices, compared to the DDM and DCF methods (Francis et al., 2000).

Under nonideal conditions of dirty surplus accounting, the DCF, DDM, and RIM valuation models may produce equivalent results, only through the application of certain accounting adjustments (Heinrichs et al., 2013). The accounting adjustments that produce equivalent results of the DCF, DDM, and RIM valuation methods correct for differences between clean and dirty earnings (Heinrichs et al., 2013). Heinrichs et al. (2013) argued in favor of using a consistent financial planning approach that allows adjustments to valuation models to compensate for nonideal conditions of dirty surplus accounting. In particular, Heinrichs et al. (2013) reasoned in favor of introducing model adjustments for share repurchases, unrealized gains or losses on securities held for sale, and foreign currency translation gains or losses. Other accounting activities that require model adjustments are derivative assets and liabilities related to gains or losses, and employee stock options exercised (Heinrichs et al., 2013). Moreover, any shareholder equity adjustments that cause variations between net income and total comprehensive income require model adjustments (Heinrichs et al., 2013). Conversely, Landsman, Miller, Peasnell, and Yeh (2011) posited that dirty surplus accounting is forecasting-irrelevant for abnormal comprehensive income, and thus should be valuation-irreverent. However, Landsman et al. (2011) found that investor misunderstanding of the economic implications of dirty surplus accounting led to investor over-valuing firms.

Jennergren (2012) examined the notion espoused by Koller et al. (2010) that return on new invested capital (RONIC) may be lower than the return on invested capital (ROIC). Therefore, new project cash flows may require a separate valuation from existing operating cash flows (Koller et al., 2010). Valuation models like the DCF model split projected cash flows into explicit forecast periods and subsequent (post-horizon) steady state or terminal periods (Jennergren, 2012). Koller et al. (2010) argued the need to include a value driver formula, where RONIC is part of the terminal value formula, rather than ROIC. Moreover, Koller et al. (2010) proposed that ROIC differentiate between existing operations returns and future returns. Jennergren (2012) postulated that, due to changing inflation rates, a firm is never truly in a steady state. Therefore, Jennergren (2012) argued that replacing ROIC with RONIC is unnecessary and may otherwise cause errors in firm valuation.

The RIM is used to determine the value of firm equity by measuring expected future cash flows attributable to equity owners of the firm (Elsner, Krumholz, & Richter, 2012). Residual income is accounting earnings, less a capital charge on the book value of equity (Elsner et al., 2012). According to Ohlson (1995), accounting-based valuation estimates and DCF equity valuations may be equally accurate where excess earnings are the sum of net income, less the product of the book value of equity, times the cost of equity. Elsner et al. (2012) further advanced the notion of RIM and DCF equality, even under circumstances of dirty surplus accounting. Elsner et al. (2012) argued that the discounted value of expected sum of dirty surpluses is zero, when discounted at a firm-specific discount rate. A formulaic representation of the residual earnings formula is as follows.

$$\textit{Value of Equity} = \textit{Book Value}_0 + \textit{Residual Earnings}_1/(1 + r) + \textit{Residual Earnings}_2/(1 + r)(r - g) \quad (26)$$

Where,

Book Value = balance sheet reported book value at time 0,

Residual Earnings$_1$ *= earnings (or net income) – (book value * r),*

Residual Earnings$_0$ *= projected next year earnings (or net income) – (book value * r),*

r = cost of equity, and

g = constant growth rate.

Ohlson (1995) provided proof of the equivalence of DCF and RIM approaches when complete financial data for the entire life of a company are available and used. Unfortunately, complete financial data are most often unavailable for the life of a company, requiring estimations of the firm's future expected performance. Moreover, assumed growth and discount rates used in terminal value calculations are less influential when using residual earnings valuation method compared to DCF methods (Cornell, 2013). As such, terminal values derived via residual earnings models are lower than terminal values in DCF models (Cornell, 2013). Unlike DCF methods, residual earnings valuation methods do not implicitly include excess cash balances in firm valuation, but rather accounts for cash in firm book value (Cornell, 2013). Cornell (2013) concluded that RIM yielded greater result accuracy than the DCF model for valuations of mature companies with significant book values. However, use of residual earnings models may not lead to superior accuracy, compared to DCF models for high growth, early-stage, distressed, and highly leveraged firms. Although firm value analysis via DCF valuation may not produce superior results, the process of DCF valuation provides management the opportunity to evaluate value creation drivers (Hoffmann, 2013).

Alternative discounted cash flow methods.

Bancel and Tierny (2011) examined an alternative approach to the DCF methodology by valuing high-risk cash flows separately from low-risk cash flows. Discounting two separate cash flows by using different discount rates accurately captures cash flow riskiness (Bancel & Tierny, 2011). High-risk cash flows are those associated with low credit rated debt obligations, where credit rating agencies predict higher than average probability of default. Bancel and Tierny (2011) argued that managers actively evaluate operating risk as a function of external and internal stimuli. For example, capital budgeting analysis requires predicting future cash flows under less than optimal case scenarios. Bancel and Tierny (2011) assumed that managers will invest equity capital in risky assets with related risky cash flows, while using debt financing to invest in low-risk assets and with related low-risk cash flows. Therefore, an after-tax cost of debt is an appropriate discount rate for low-risk cash flows, while a risk-adjusted cost of equity is an appropriate discount rate for high-risk cash flows (Bancel & Tierny, 2011). Bancel and Tierny (2011) posited that the bifurcation of cash flows based on risk is superior to combining all operating cash flows and discounting combined cash flows by the firm's weighted average cost of capital.

Orsag and McClure (2013) argued in favor of a modified DCF valuation model that uses a reinvestment rate to account for real options, such as abandonment, extension of projects, or acquisitions. For firms with nonconstant debt levels, Koller et al. (2010) argued in favor of the adjusted present value (APV) approach to discounting future expected cash flows for firm valuation. Moreover, Koller et al. (2010) supported using an unlevered cost of capital as a viable alternative to the WACC. The APV approach values the firm as all-equity financed, then adds the present value of the future tax benefits associated with projected debt financing. The following is a formulaic representation of the cost of capital used in the APV valuation approach.

$$k_e = k_u + \frac{D - V_{txa}}{E} (k_u - k_d) \tag{27}$$

Where,

k_e = *cost of equity,*

k_u = *unlevered cost of equity,*

D = *market value of firm debt,*

V_{txa} = *value of debt-related tax shield,*

E = *market value of equity, and*

k_d = *cost of debt.*

Holthausen and Zmijewski (2012) and Ross et al. (2010) supported earlier findings that APV valuations should equal WACC valuations under steady-growth scenarios. However, Dempsey (2013) reasoned that an APV to WACC equivalency occurs only when debt levels and related tax benefits vary, relative to expected firm growth.

Modern portfolio theory.

The inclusion of an examination of modern portfolio theory provides a framework for understanding concepts that complement other theories advanced in this study. Modern portfolio theory asserts that investors reduce asset risk through portfolio diversification (Markowitz, 1952, 2014). As such, portfolio risk managers attempt to reduce loan portfolio or credit portfolio risk through customer and sector diversification (Rosen & Saunders, 2010). However, commercial finance companies tend to focus on targeted industries or sectors that cause portfolio industry concentrations. Portfolio diversification reduces firm-specific, or idiosyncratic, risks. Portfolio concentrations undo some of the risk reduction benefits associated with portfolio diversification. Moreover, competitive pressures from competing commercial finance companies constrain expected portfolio returns. Markowitz (1952) postulated the benefits of achieving an efficient frontier of an optimal portfolio that maximizes possible expected returns, while simultaneously reducing portfolio risk through diversification. However, commercial finance companies cope with competitive market forces that degrade expected returns. Moreover, customer-related sector concentrations result in poorly diversified loan portfolios. As such, the cost of equity, as a function of the CAPM and market derived beta coefficients, may not truly reflect the riskiness of portfolio investments (Da et al., 2012) of commercial finance companies.

Markowitz (1952) introduced a model of mean-variance as a motivating force of asset selection by risk adverse investors seeking to minimize the variance of portfolio returns, while simultaneously seeking to maximize expected returns respective of variance. Markowitz (1952) pioneered the notion of modern portfolio theory and posited that investors find maximum expected returns desirable while finding investment return variance undesirable. Diversification reduces fluctuations of portfolio returns by reducing or eliminating idiosyncratic risks. Asset diversification, therefore, is superior to nondiversification in meeting the desires of investors (Markowitz, 1952).

Tu and Zhou (2011) further advanced the notion of risk-aversion through diversification, by arguing that an optimal combination of portfolio assets exists that maximizes expected utility. Rosen and Saunders (2010) examined contributions of risk factors that affect portfolio risk. Systematic or nonidiosyncratic risk factors affecting credit portfolio losses are market risk, macroeconomic, geographic, and industry risk factors (Rosen & Saunders, 2010). Through a reduction of industry sector and geographic region concentrations, portfolio diffusion decreases portfolio risk (Humphery-Jenner, 2013). Similarly, portfolio risk factors include market risk factors, such as changes in interest rates, exchange rates, equity volatilities, and other financial market risk factors (Rosen & Saunders, 2010). Actions taken to mitigate portfolio risk factors may reduce investor risk at the cost of lower investor returns.

In summary, modern portfolio theory postulates that investors should diversify among securities that maximize expected returns and minimize the variance of returns. However, commercial financial companies often have loan portfolios comprised of a few selected industries, rather than a cross-section of all industries. As such, commercial finance companies appear to attempt to maximize expected returns, while accepting variances of returns.

Credit Portfolio Risk

Credit risk models for analyzing loan portfolios should include nonsystematic risk factors reflecting individual borrower risk factors, and aggregating all such risk factors in determining portfolio loss predictions. Moreover, portfolio loss assessments require consideration of credit risk concentrations (Rosen & Saunders, 2010). Giesecke and Kim (2011) examined stochastic methods of measuring the riskiness of collateralized debt obligations portfolios. Collateralized debt obligations are portfolio credit derivatives tied to underlying credit instruments, such as corporate bonds, loans, or mortgages (Giesecke & Kim, 2011). Past studies found that collateralized debt obligations risk hedging is a function of expected discounted derivative cash flows and risk-free rates (Giesecke & Kim, 2011). Risk hedging differs from portfolio risk, where investors are at risk of nonpayment, due to borrower default. Any inference of loan portfolio risk should include an assessment of historical default rate experience and consideration of an adaptive point process model of portfolio default timing that addresses risk management applications (Giesecke & Kim, 2011). Furthermore, portfolio risk includes borrower risk of clustering of default, where common linkages exist between borrower firms' default and economic conditions and contractual relationships between firms that propagate financial distress of related firms.

In an investigation of portfolio risk, Chen, Fabozzi, and Huang (2012) examined the impact of transaction cost on portfolio risk assessment, under mean-variance (VaR) and mean-conditional value-at-risk (CVaR) strategies. A VaR strategy seeks an optimal portfolio of risky assets, derived by estimating measurements of the risk of loss of a specific portfolio of financial assets. According to Chen et al. (2012), a CVaR strategy is similar to a VaR strategy, but with an additional ability to accommodate different risky assets and their related return on investment yields. CVaR analysis provides a conditional expectation of portfolio loss, equal to or exceeding VaR analysis (Chen et al., 2012). Chen et al. (2012) concluded that transaction cost plays an important role in portfolio risk analysis and risk aversion. Furthermore, a CVaR framework provides an optimal portfolio risk solution (Chen et al., 2012).

An evaluation of bank loan portfolios is similar to an evaluation of commercial finance company loan portfolios. Bookstaber, Cetina, Feldberg, Flood, and Glasserman (2014) advised that stress testing of bank loan portfolios remains a microprudential practice that focuses on the resilience of individual banks. Bookstaber's et al. (2014) postulation is contrary to the view that stress testing of bank loan portfolios is a macroprudential exercise of firm-transmitted risk and market-related risk. Macroprudential stress testing uses structural economic models designed by central banks for forecasting and policy analysis (Melecky & Podpiera, 2012). In general, stress testing is either macro- or micro-based, where macro factors link credit risk to macro-market conditions, while micro factors focus on the riskiness of individual borrowers (Foglia, 2009). Stress testing should include scenario analysis of exogenous shocks, asset and liability risk exposure analysis, system-wide shock impact analysis, and outcome analysis of bank solvency (Borio, Drehmann, & Tsatsaronis, 2014). Bank stress testing approaches should be a multi-stage process of linking macroeconomic variables to credit risk, individual bank asset quality, and asset risk impacting bank earnings and capital (Foglia, 2009).

Opacity in banking refers to a lack of disclosure that creates information asymmetry between depositors, investors, and other stakeholders, and related banking institutions (Jones, Lee, & Yeager, 2013). The moral hazard associated with deposit insurance enables banking institutions to practice reporting opacity, as depositors' reliance on insurance offsets their need to understand bank performance (Jones et al., 2013). Opacity causes market inefficiency, as investors cannot accurately assess asset risk and bank performance (Jones et al., 2013). Thus, there exists the potential for a magnification effect of future financial crises connected to financial reporting opacity. The opacity of financial information leads to information uncertainty (Jones et al., 2013). Information uncertainty leads to scenarios where investors' rates of return on bank investments do not equate to the true level of risk associated with banks' investment activities (Jones et al., 2013). As such, the true value of banking institutions may be significantly less than the market-determined values (Jones et al., 2013). Loan portfolios represent primarily opaque assets of banking concerns, as banks maintain borrower information and other portfolio-related information not revealed to investors (Jones et al., 2013). Furthermore, principal-agent conflicts may lead banks to overinvest in opaque assets, thereby reducing bank value at the expense of investor value. Jones et al. (2013) conclude that stricter regulatory requirements of financial disclosure that lessen opacity may reduce unsystemic risk relating to investments in banking institutions.

Transition

Section 1 offered an overview of the foundation of the study and a review of the professional and academic literature related to the study. The professional and academic literature review includes a discussion of market efficiency, the cost of equity capital, beta coefficients, the cost of debt, capital structure, and weighted average cost of capital. Moreover, the literature review includes discussions of alternative measurements of the cost of capital, growth rate estimations, and business valuation models. The literature review also includes a synopsis of alternative discounted cash flow methods, modern portfolio theory, and credit portfolio risk. Finally, the literature review provides a critical analysis and synthesis of the past and recent examinations of topics related to this doctoral study.

Section 2: The Project

Section 2 begins with a discussion of the methodology and design used in this quantitative, comparative, and correlational study. After a reiteration of the study's purpose, I discuss my role as a researcher in data collection, data organizing, and data analysis. This section also includes a discussion of study validity via external and internal validity and threats to statistical conclusion validity. Moreover, the section contains a discussion of instrument reliability and assumptions made in the statistical analysis of the data.

Purpose Statement

The purpose of this quantitative, comparative, and correlational study was to examine the relationship between valuation model results, the book value of equity, and the market value of equity of participating commercial finance companies. The valuation models examined in the study include the DCF model, the risk-adjusted DCF model, the dividend discount model, and the residual income model. I specifically examined whether the results of each valuation model, combined with company book value of equity, significantly predicts the market value of equity of commercial finance companies. In addition, I compared the linear combination of valuation results and the book value of equity to the market value of equity of participating companies.

The linear combination of valuation model results and company book value that significantly predicts the market value of equity is more accurate than combinations resulting in insignificant predictions. Insignificant predictions are the linear combination of valuation model results and company book value that do not significantly predict the market equity value of the valued firms. In this study, the research data consisted of financial statement information from the participating commercial finance companies. The market value of equity of the participating companies served as the dependent variable. Calculated results of four valuation models and company book value of equity served as independent variables.

This project was important to create because accurate valuation models allow business leaders and other stakeholders the ability to measure the impact of management actions accurately. Management actions that create value enhance the probability of a successful business enterprise. Successful businesses enhance local communities by providing quality job opportunities for and a positive economic impact on local citizens.

Role of the Researcher

As the researcher conducting this quantitative study, I undertook to gather, organize, analyze, interpret, and securely store collected data. Data used in the study included accounting and financial statement information of participating companies. I obtained the primary study data from the U.S. Securities and Exchange Commission's *EDGAR* electronic data gathering, analysis, and retrieval system. I also obtained readily accessible additional information from financial data websites such as Macroaxis, Inc.; YCharts; the NYSE and NASDAQ Exchanges; Reuters; and Morningstar, Inc. Transposition and input of gathered data into financial spreadsheet models and statistical software allowed for financial, valuation, and statistical analysis. I also provide an interpretation, explanation, and presentation of the financial models and statistical analysis results, as well as study presentations of the findings, conclusions, and recommendations for followup studies.

Participants

This project and doctoral study did not use individual human participants; instead, the participating companies consisted of eight publically listed commercial finance companies that I analyzed using secondary financial data on valuations of those companies. These eight companies are referred to in this study as CFCP1, CFCP2, CFCP3, CFCP4, CFCP5, CFCP6, CFCP7, and CFCP8 (pseudonyms). Each of these companies were publically traded commercial finance companies that had loan portfolios at the time of the study and that provide adequate transparency in reported financial statement data.

According to the EFLA (2013), most commercial finance companies are subsidiaries of parent companies. Subsidiary companies' financial performance is consolidated and reported via parent company's consolidated financial statements. As such, most commercial finance companies do not file detailed financial information regarding their lending and leasing operations. Although all financial information and related data collected on participating companies are available in the public domain, I stored all of the data that I collected in a password-protected electric file folder or a locked file drawer.

Research Method

A quantitative methodology supports a postpositivism worldview of determination and empirical observation and measurement (Patterson & Morin, 2012). Quantitative research enhances researchers' ability to examine group differences, without influence by notable occurrences of a phenomenon (Westerman, 2011). A quantitative correlational research method, which I selected for this study, is suitable for determining whether a relationship exists between quantifiable variables (Boslaugh, 2013).

The research for this doctoral study served as an explanatory and analytical study that tested hypothesized causal relationships between variables, where variables that describe natural phenomena are countable. Regression analysis of security beta provided input data necessary to calculate the cost of capital of participating companies via the CAPM. The study also utilized regression analysis of participating companies' stock betas, which were derived using historical stock prices measured against the broader market's historical performance. The regression analysis results include beta coefficients that mimic the sector industry, as noted by Yao (2012).

Any length of time that lapses between data collection points is a factor of consideration in the study. Current stock data have greater importance than stale stock performance data, as the magnitude of correlation decreases the longer the lag time between measurements (Christian, Garza, & Slaughter, 2011). This study also included a quantitative correlational analysis of variable data. The purpose of the analysis was to establish the relationship between independent variables of valuation model results and the book value of equity, and dependent variables of the market value of equity of participating companies. An analysis of variance of valuation model results and market value of equity follows the models of studies by Jorgensen et al. (2011) and Belo, Xue, and Zhang (2013).

Survey research is a quantitative strategy that provides a numerical description of the opinions of a sample population (Bennett et al., 2011). Correlations of variables and variable combinations, as statistically measured by survey results of participantcompleted questionnaires, provide a basis for numerically testing hypotheses (Johnson & Wislar, 2012). The existence of a relationship between variables establishes inferences of causality (Glass, Goodman, Hernán, & Samet, 2013). Glass et al. (2013) study included an examination of the relationships between variables to infer causality. However, surveying managers of participating companies did not determine the viability of different valuation models that accurately value commercial finance companies. Accordingly, a quantitative strategy of inquiry that employs a survey research methodology was not useful for testing the hypotheses of this study.

Unlike quantitative research, qualitative research is fundamentally interpretivistic and constructivistic (Petty, Thomson, & Stew, 2012). The goal of qualitative research involves exploring and describing social phenomena by attaining an understanding of real-world events from the perspective of study participants (Petty et al., 2012; Tufford & Newman, 2012). Qualitative research emphasizes processes and meanings through in-depth focus group interviews and participant observations (Petty et al., 2012). Qualitative research approaches include ethnography, grounded theory, case study, phenomenology, and narrative (Petty et al., 2012). The nature of ethnography, from a social constructivist worldview, is to enhance an understanding of culture, diversity, and context of group interactions with the real-world phenomenon (Ronald, 2011). A qualitative ethnographic strategy was an inappropriate research method for this study, because it lacks the experimental and quasi-experimental treatment of variables that lead to statistically supported conclusions.

As a qualitative strategy, grounded theory is an iterative and recursive approach to developing a theory about a social phenomenon (Ronald, 2011). The grounded theory seeks to uncover relevant conditions through interviews and observations that shed light on the topic of study (Hanson, Balmer, & Giardino, 2011). Firm valuation is a well-grounded field of study. Further grounding the subject of firm valuation was not the purpose of this study. Rather, the study was an examination of the results of various contemporary valuation models through quantitative statistical analysis and interpretation that validates observed measurements. Quantitative research is reproducible. The challenge of reproducing grounded theory research emerges from a lack of conditions that exactly match the original study (Fram, 2013). Because it was imperative that the results of the study be readily reproducible in order to be of value to business leaders, the grounded theory qualitative research method was not a theory used in the study.

Case study research is a methodology for developing new theories, using a theoretical or biased sampling approach (Barratt, Choi, & Li, 2011). Understanding how case studies relate to a broader body of knowledge is a crucial challenge for researchers (Barratt et al., 2011). Using a case study research methodology for an examination of the topic of this study would offer limited merit as a research method for advancing or discrediting the stated hypotheses. A case study approach does not provide the data analysis needed to determine beta coefficients used in the CAPM. Moreover, case study research methods do not include the rigorous testing of significance required to reject the stated hypotheses of the study. Therefore, a case study research method was inappropriate for this study.

Phenomenology research examines and interprets the everyday experiences of humans (Converse, 2012). According to Tuohy, Cooney, Dowling, Murphy, and Sixsmith (2013), a researcher's personal knowledge is of value and necessary to phenomenological research. Researchers may undertake bracketing, where they identify areas of potential bias in an attempt to minimize bias influence (Chan, Fung, & Chien, 2013). Pringle, Drummond, McLafferty, and Hendry (2011) argued that a weakness of many phenomenological studies is a lack of scientific rigor necessary for generalization of study findings. A research methodology that engages in the extensive and prolonged study of a small number of subjects would do little to answer this study's research question. This study was an examination of four valuation model results and the book value of equity, using financial data and market value of equity of participating companies. A phenomenological study does not provide the scientific rigor needed to generalize study results. Therefore, it was of limited value as a research method for this study.

Narrative researchers seek to understand the meaning of individuals' life experiences through participant narrations of their life stories (Wiles, Crow, & Pain, 2011). Narrative theory supports the argument that stories transfer knowledge, where stories represent accounts of peoples' experiences (Paschen & Ison, 2014). Narrative inquiry is a philosophical approach to the nature of social reality and is the initial roadmap for an interpretation of the meaning of human relationships (Halverson, Bass, & Woods, 2012). A narrative research methodology may provide insight into the interrelationships and inter-workings of organizations, but it will not support the research of valuation models used for company valuation. As such, a narrative research method was not a research methodology conducive for this study.

In summary, qualitative strategies of ethnography, grounded theory, case study, phenomenology, and narrative research do not support this study. As stated previously, the research described here featured an examination of the accuracy of various valuation models, combined with book value in accurately valuing commercial finance companies. Furthermore, survey research, as a quantitative strategy of inquiry, was not conducive as a research methodology for the study, as it does not determine the influencing effects that treatments have on outcomes. Therefore, because a quantitative research strategy of experimentation using regression analysis provides for an understanding of the relationships between independent variables and a dependent variable, it was the research method chosen for this study.

Research Design

The research design of this quantitative study utilized postpositivism with a deterministic perspective. Quantitative research using an experimental design was appropriate for this study, as the study's objective was to employ statistical analysis to determine the relationship between variables and to test hypotheses. Related past studies undertook a statistical analysis of CAPM input variables (Fama, 1970; Fama & French, 2004). Statistical analysis has been used in other studies as part of an examination of firm valuation models to test hypothesized theories (Elsner et al., 2012; Ohlson, 1995). Key determinants of research design choice are bias minimization and generalizability maximization (Meyer, Wheeler, Weinberger, Chen, & Carpenter, 2014). This doctoral study included an introduction to external variables and deliberate manipulation of variables in a controlled setting. Subsequently, other nonexperimental designs, such as surveys or other methods of data collection where data manipulation does not occur were not appropriate for his study.

The study involved the use of statistical analysis methodologies of simple linear regression, multiple linear regression, and correlation coefficient analysis. Variables analyzed in the study included stock market indices, participating companies' common share prices, the book value of equity, the market value of equity, and valuation model results. An underlying assumption of linear regression is that a dependent variable (y) is the function of one or more independent variables (x). The general formula for simple linear regression is $y = ax + b$. In the formula, y is the outcome or dependent variable, a is the slope or coefficient, x is the independent variable, and b is the constant or intercept (Boslaugh, 2013). A firm's stock beta coefficient is its covariance of return, relative to the variance of return on a market portfolio of stocks (Patton & Verardo, 2012).

Equation 7 is a formulaic expression of the formula used in the study for estimating a security's beta coefficient. Rewriting the linear regression function for firm beta results in the equation $R_j = a + bR_m$ (Damodaran, 2012). In the rewritten linear regression function, a is the intercept from the regression and b is the slope of regression, relative to the covariance $(R_j, R_m)/\sigma_m^2$ (Damodaran, 2012).

Strength of relationship statistics include the Pearson product-moment correlation coefficient r, the multiple correlation coefficients R, and the squared multiple correlation coefficient R^2 (Green & Salkind, 2011). R^2 is the coefficient of determination (Boslaugh, 2013), and is a measure of the goodness of fit in the regression between the independent variable and dependent variable. In a bivariate linear regression analysis for measuring a firm's stock beta, the R^2 represents an estimate of the proportion of firm risk attributable to market risk, while $1 - R^2$ estimates firm specific risk (Damodaran, 2012) or idiosyncratic risk. The R^2 value is an index relating to the predictability of a dependent variable y via its relationship with an independent variable x (Green & Salkind, 2011).

High R^2 values indicate that stock price variance relates to market risk, while low R^2 values indicate variance is a function of firm-specific components (Damodaran, 2012). Stocks with beta coefficients greater than 1 have stock price volatility in excess of the broader market price volatility (Frazzini & Pedersen, 2014). A correlation coefficient of 1 indicates a perfect relationship (Boslaugh, 2013), where actual returns of a stock equal the actual returns of the broader equity market. Hence, a company with a common stock beta equal to 1 would experience stock price variance equal to the broader market, and thus have asset risk equivalence to the average common stock (Koller et al., 2010).

In addition to determining stock beta and R^2, regression analysis results include a measure of standard error of the beta estimate that represents the variance or dispersion of *N* observations from the regression line or slope line. High standard error values indicate poor accuracy of the tabulated stock beta with a wide range of beta values within a confidence interval. Conversely, low standard error values indicate accurate stock betas with a slim range of beta values in a confidence interval. Theoretically, increasing the number of like-kind company stocks improves or decreases the standard error. Therefore, this study included a linear regression analysis of the average monthly returns of the participating companies' stock performance, relative to the S&P 500 market index. A weighted average of participating companies' beta is a proxy for the sector beta coefficient.

The Pearson correlation coefficient is a statistical method for measuring the linear relationship between independent variables and a dependent variable (Boslaugh, 2013).

Multiple regression analysis was undertaken to compare the results of four valuation models, combined with the book value of equity, with the market value of equity of participating companies. High correlation coefficient scores denote strong relationships between variables, where the mean score of one variable moves in the same direction as changes in another variable.

The *p*-value statistic in a *t*-test provides a numerical representation of the significance of the correlation between variables. A *p*-value that is statistically significant is less than .05 for a one-tailed test or .001 for a two-tailed test (Green & Salkind, 2011). To minimize the chances of a Type I error (false positive finding), use of the *Bonferroni* approach requires a *p*-value less than a corrected significance level. Tabulating a corrected significance level is a matter of dividing the applicable .05 or .001 by the number of computed correlations (Green & Salkind, 2011).

Population and Sampling

Population

Commercial finance companies are lending institutions that provide various types of loan products and services to business clients. Loan products offered to customers by commercial companies may include accounts receivable financing, inventory financing, purchase order financing, and equipment financing. Specialized commercial financing products are account receivable factoring, trade finance, project financing, and floor plan inventory financing. The Commercial Finance Association (CFA) and the Equipment Leasing and Finance Association (ELFA) are the two prominent trade associations representing firms in the commercial finance sector. The CFA has 202 lender company members located in the U.S. and Canada (CFA, 2014). The ELFA has 336 lender company members located in the U.S. and Canada (ELFA, n.d.). CFA members may also be members of the ELFA. Table 2 is a representation of lender member companies of CFA and ELFA, segregated by business type.

Table 2

CFA and ELFA Lender Member Companies Segregated by Business Type

	CFA Lender Member		ELFA Lender Members	
Business Type	Number	Percentage	Number	Percentage
Independent	128	63.4%	171	50.9%
Captive	0	0.0%	47	14.0%
Conglomerate Subsidiaries	8	4.0%	3	.9%
Banks	30	14.9%	30	8.9%
Bank Subsidiaries	19	9.4%	64	19.0%
Bank Division	17	8.4%	15	4.5%
Insurance Company Subsidiaries	0	0%	6	1.8%
Total	202	100%	336	100%

Note: CFA and ELFA lender membership data are as of October 15, 2014

Independent finance companies are lending firms that are not subsidiary companies of conglomerates, banks, or insurance companies. Independent finance companies are lenders that provide loans directly to borrower clients, or who are originator-broker firms that act as intermediaries between borrower clients and funding sources. Sources of funding include banks, bank subsidiaries, insurance companies, insurance subsidiaries, conglomerate financial services subsidiaries, captive finance companies, hedge funds, and private investors. Captive finance companies are subsidiary companies or operating divisions of firms that sell equipment, which supports the acquisition financing needs of their clients. For example, Dell Financial Services provides financing to customers of Dell, Inc. to support the purchase of Dell computers and peripheral equipment. Conglomerate subsidiary commercial finance companies provide financing to corporate customers and noncustomers of parent or subsidiary companies. For example, GE Capital Corporation is a conglomerate subsidiary commercial finance company of the General Electric Company.

Access to historical financial information of private commercial finance companies is problematic, as nonpublicly traded finance companies are not required to disclose financial information. Moreover, subsidiary finance companies of publicly traded parent companies disclose summary financial data, as reported in parent companies' consolidated quarterly and annual financial reports. Similarly, parent companies of captive finance subsidiaries report financial performance on a consolidated basis, with limited transparency of subsidiary commercial finance company operations. Moreover, borrowers of captive finance companies are customers of the captives' parent company or other related company. As such, parent and captive subsidiaries share similar industry risk profiles associated with the industries of their customers. Arguably, captive finance companies do not attempt to diversify their loan portfolios through a cross-section of industry sectors. Therefore, captive finance companies did not qualify as suitable participating companies for this study.

Sampling

This study's participating companies are public U.S. and Canadian commercial finance companies that provided sufficient financial statement transparency for use in the valuation model. The participating companies were not captive finance companies or bank subsidiary finance companies. Eight commercial finance companies fit the selection criteria. References of the eight commercial finance companies are CFCP1, CFCP2, CFCP3, CFCP4, CFCP5, CFCP6, CFCP7, and CFCP8.

Each participating company studied was valued using four different valuation models for the years 2009 through 2013. Valuation model results and company book value of equity underwent time-series multiple regression analysis to determine their linear relationship with company market value of equity. In an attempt to mitigate daily stock market price fluctuations, an average of 21 days of common stock prices was used to derive the market value of equity (Reddy et al., 2013). The 21 days of common stock prices corresponded to post-release dates of annual financial statements of the participating companies.

The selection of participating companies represents a purposive, nonprobabilistic sampling, centered on the availability of accounting and financial data and other section criteria. Because the selection of participating companies was not a random probabilistic sampling, the participating companies may not represent the target population. However, since the participating company selection includes all firms that fit the criteria, and because the selection criteria were unbiased, the participating companies represent an unbiased selection.

Boslaugh (2013) advanced a general rule that a sample size of 30 or more drawn from a population is large enough to approximate a normal sample distribution. The use of statistical software G*Power, using an apriori sample size analysis, affords users the ability to determine an appropriate sample size (Faul, Erdfelder, Buchner, & Lang, 2009). Multiple regression analysis permits an examination of the relationship between the results of differing valuation models, combined with the book value of equity and market value of equity of participating companies. The purpose of the multiple regression analysis was to determine the predictive abilities of the independent variables to predict the dependent variable. Insufficient participating companies' group parameters prohibited predetermining sample means and standard deviations of groups, as needed for estimating the effect size for determining the sample size (Faul et al., 2009). The effect size is a quantitative measurement of the strength of a phenomenon (Fritz, Morris, & Richler, 2012).

In this study, the assumed value of the effect size was .8, as recommended by Cohen (1988) and Fritz et al. (2012). Results of research conducted by Heinrichs et al. (2013) suggest that a credible relationship exists between DCF, DDM, and RIM valuation model results and the market capitalization of firms. Such credibility supports the use of a large effect size. Although this study had eight participating companies, the total number of observations was 34, due to multiple observations of participating companies using four different valuation models and differing valuation periods. Using G*Power with an estimated large effect size of ($f = .15$), $\alpha = .05$, the minimum sample size needed to achieve a power of .95 is 89. G*Power, with an estimated large effect size of ($f = .15$), $\alpha = .05$, and a total sample size of 34 cases, tabulates a statistical power of .59. G.

Norman (2010) observed that, where conditions lead to statistically significant results, small sample sizes do not invalidate results of the statistical analysis.

In this study, the combination of valuation model results with company book value of equity that significantly predict the market value of equity led to my accepting the null hypotheses. Conversely, valuation model results, combined with company book value of equity that does not significantly predict the market value of equity, supported rejecting the null hypothesis. Differences between valuation model results and market capitalization reflect errors or inaccuracies of valuation model results. A significant error indicates inferior accuracy of a particular valuation model while few or no error signifies superior accuracy of a valuation model. A statistically significant relationship between a valuation model result and market capitalization exists where the standard error mean is small and where the *p*-value is less than .05.

Ethical Research

In this study, the data consisted of publically disclosed accounting and financial data, stock market price, and other information of participating companies. Future usage of study data in financial spreadsheet valuation models allowed for the determination of the value of the participating companies. Financial statement data of the participating companies are readily available from the Securities and Exchange Commission's EDGAR database of publicly traded firms in the U.S. For Canadian companies, financial statement data are available via the Canadian Securities Regulator's SEDAR database of Canadian publically traded companies. Participating company consent and provisions for participants' voluntary withdraw are unnecessary for protecting the rights and welfare of the participating companies. However, all acquired and derived data relating to participating companies, valuations results, and statistical analysis have been stored in an encrypted electric file and retained for no less than five years. Safeguarding dissemination of participant data is unnecessary for protecting the rights and welfare of research participants, as all accounting and financial information used in the study are readily available in the public domain. Use of historical data ensures that participating companies and their stakeholders did not suffer psychological, relationship, legal, economic, professional, physical, or other risks as a result of this study. Moreover, all data used in the study are readily available to and used by securities analysts, investors, and other stakeholders of participating companies. As such, the study did not pose additional risks to stakeholders of participating companies. Since I have no affiliation with, and am not a stakeholder of, one or more of the participating companies, no conflict of interest exists.

The study includes copyrighted materials previously published in the ELFA trade publication *The Monitor*. The publisher of *The Monitor* has provided me with written permission to use copyrighted materials from the publication in this study. The study does not include the use of human subjects or animals for research. The doctoral study has received Walden University IRB approval. The IRB approval number 09-30-15-0332274. The doctoral study does not include the names or any other identifying information of the participating companies or related individuals.

To help ensure applicable use of ethics standards, I have earned a certification of completion of the National Institute of Health (NIH) web-based training course titled *Protecting Human Research Participants.* The date of completion is April 16, 2013, and the certificate number is 1180261.

Data Collection Instruments

The instruments used in this study were four business valuation models, which included the DCF model, a risk-adjusted DCF model, the DDM, and the RIM. Valuation practitioners commonly employ DCF, DDM, and RIM valuation models (Penman & Sougiannis, 1998).

Fisher (1930) and Williams (1938) published initial formulations of the DCF model. The time preference of income concept advanced by Fisher (1930) and Williams (1938) is an equation for the value of the firm that was an early form of the DCF model. The DCF model is an income approach to valuation (Hitchner, 2011). The DCF model is synonymous with the *Free Cash Flow to the Firm* (FCFF) approach to valuation (Damodaran, 2012). Alternatively, the DCF model is synonymous with the *Enterprise Discounted Cash Flow Model* (Koller et al., 2010). DCF model results depend on discount expected future free cash flows that reflect the present value of an organization's operating assets. Subtracting the fair market value of all nonequity claims from the results of the DCF model equates to the equity value of the firm (Koller et al., 2010). FCFF is the sum of net operating profit, less adjusted taxes, plus depreciation, minus changes in working capital, minus capital expenditures (Damodaran, 2010). FCFF also includes changes in capitalized lease obligations, investments in goodwill and other acquired assets, changes in net other operating assets, and changes in accumulated other comprehensive income (Koller et al., 2010). Input variables used in the DCF model are the scale of measurements, ratio, and continuous data. FCFF is in dollar terms, time is in years, and investor required returns and cash flow growth rates are in percentage terms.

The DCF model instrument correlates to the research problem, research purpose, and the research question. Thus, the DCF model was a suitable instrument for determining firm value and equity value of participating commercial finance companies. A formulaic representation of the DCF model expressed in an Excel spreadsheet, and used consistently to value all participating companies, provided a foundation for unbiased results. DCF model valuation results, as denoted in dollar terms, represent an estimation of firm value. Subtracting the market value of all nonequity obligations from the DCF value of the firm represents an estimation of the value of common equity of each participating company. The risk-adjusted DCF model utilized mirrors the DCF model formula, except that discount rates reflect asset portfolio risks attributable to each participating company's loan portfolios.

Myron J. Gordon and Eli Shapiro introduced the DDM in 1956. They developed the DDM mathematically to derive an estimate of the market price of common equity shares for dividend paying companies (Gordon & Shapiro, 1956). Input data variables used in the DDM are the investor required rate of return and time-period estimations of expected future dividends. Initially, Gordon and Shapiro (1956) postulated a constant growth or no growth dividend model. Gordon later refined the DDM to include future dividend growth, now known as the *Gordon Growth Model*, by estimating expected future growth of company earnings. An investor-required rate of return is an expected rate of return that market participants require as enticement to invest in a particular equity investment (Hitchner, 2011). The scale of measurement for all input variables of the DDM are ratio and continuous data, where future dividends are in dollar values, time are in years, and growth and investor required returns are percentages.

The DDM was an appropriate instrument for calculating the estimated market value of equity of the participating commercial finance companies. The DDM valuation model relates to the research problem, purpose, and the question of this study. An Excel spreadsheet, with a derived DDM formulation, was the analysis tool used to calculate the estimated equity value of participating companies. Use of a common Excel spreadsheet DDM model to value all participating companies' equity provided a basis of replicability and uniformity. Successful replication is an essential element of academic research (Braver, Thoemmes, & Rosenthal, 2014). Comparison of the DDM valuation results with valuation results of RIM, DCF, and RADCF models and market value of equity provides a basis for evaluating the goodness of the models to value commercial finance companies accurately. DDM valuation results are in dollar terms that represent the value of all outstanding common equity shares of each participating company.

The RIM is a term commonly used for the *Excess Cash Flow Model* (Hitchner, 2011) and the *Free Cash Flow to Equity Discount Model* (Damodaran, 2012). Edgar Edwards and Philip Bell first introduced the RIM in 1961. They posited that expected firm dividends relate to company assets, where the sum of such dividends represents the value of the firm, based on a particular asset arrangement. Firms seeking profit maximization should select an optimal composition of assets that has the greatest subjected value (Edwards & Bell, 1961). Unlike the DDM, which values future expected distributed dividends to shareholders, the RIM values all excess cash flows available for shareholder distribution, regardless of amounts distributed as dividends (Damodaran, 2012). Residual income is the sum of net income, less net capital expenditures, less change in noncash working capital, plus new debt issued, and minus debt repayments of principal. Input variables of the RIM are scales of measurements that are ratio and continuous data.

In this study, excess cash flows are dollar values, time is a function of years, and growth rates and investor required returns are percentages. The RIM was an appropriate instrument for calculating the estimated equity value of participating commercial finance companies. The RIM directly relates to the research problem, research purpose, and the research question. Formulaic representation of the RIM, as modeled in an Excel spreadsheet and uniformly applied to value all participating companies, helps ensure unbiased results. The relative accuracy of RIM valuation results, relating to market capitalization as compared to valuation results of DDM, DCF, and modified DCF, provided a foundation for evaluation of the accuracy of the model. RIM valuation results are in dollar terms and represent the estimated value of all outstanding common equity shares of each participating company.

Penman and Sougiannis (1998) and Francis et al. (2000) compared the accuracy of the DCF, DDM, and RIM equity valuation models. They found that the RIM yielded more accurate results than the DDM and DCF, when comparing results to the market value of equity. However, the findings diverged from those of Plenborg (2002), whose work demonstrated the equivalence of DCF and RIM model results. Lundholm (2001) examined reasons researchers and practitioners frequently derive differing estimations of firm equity value, using DCF versus RIM models. Lundholm (2001) found equivalent DCF valuation model and RIM results when void of implementation errors, such as inconsistent forecasting errors, incorrect discount rate errors, and missing cash flow errors. Similarly, Fernández (2007, 2013) deduced that DCF, RIM, and eight other valuation models all yield the same result when implemented correctly. Conversely, Reddy et al. (2013) argued that different valuation models yield differing results, depending on practitioners' specialized knowledge of the macro market environment. Jorgensen et al. (2011), however, argued the equivalency of equity valuation models, only under conditions of clean surplus accounting. In summary, DCF, DDM, and RIM valuation models may yield similar results when forecasted future cash flows reflect macro-market environmental factors and where valuation models undergo adjustments to eliminate any adverse effects of dirty surplus accounting.

Concurrent validity refers to the extent that scores from a test correlate to a known and valid measurement (Hart & Sharfman, 2012). Market capitalization narrowly approximates firm value, with the caveat that semistrong form efficiency concedes the existence of market inefficiencies. As dependent variables in this study, the market value of equity or market capitalization, a construct of firm equity value, tests the accuracy of valuation model results and substantiates concurrent validity. The DCF, DDM and RIM valuation models used in this study encompass model designs of past research, thereby supporting construct validity. Valuation model designs employed in this study are adaptations of valuation models espoused by finance academics and valuation professionals. Valuation model adaptations used in this study included formulations advanced by Damodaran (2012), Fernández (2007), Jorgensen et al. (2011), Koller et al. (2010), Lundholm (2001), and Lundholm and O'Keefe (2001).

Convergent validity, a subtype of construct validity, is a convergence between theoretically similar constructs (Walls, Phan, & Berrone, 2011). The firm value derived from valuation models, book value of equity, and market value of equity relate to firm performance and macroeconomic force determinants that evidence convergence validity. Discriminant validity, also a subtype of construct validity, is an instrument's ability to discriminate between theoretically different constructs (Walls et al., 2011). Past studies by Francis et al. (2000), Lundholm and O'Keefe (2001), and Penman and Sougiannis (1998) revealed that high correlation coefficients exist between company valuation model results and market capitalization. Past studies proposed high correlations between theoretically similar constructs and low correlation coefficients for theoretically dissimilar constructs. This study further examined instruments and constructs examined in related past studies. Establishment of convergent and discriminant validity via four valuation model results (independent variables), the book value of equity (independent variables), and market value of equity (dependent variables) evidences construct validity.

Reliability is the degree to which measurements of a construct taken at different intervals or by different observers produce similar results (Kottner et al., 2011). Reliability is an essential element of instrument validity (Walls et al., 2011). Absolute and relative consistencies are critical constructs of test-retest reliability (Preuss, 2013). Consistency of scores is an absolute consistency concern while rank-order consistency is a relative consistency concern (Preuss, 2013). The use of expert qualified valuation models and an adapted risk-adjusted DCF valuation model built upon accepted valuation principles that ensure absolute and relative consistency and test-retest reliability of the instruments employed in this study. The study also included the use of constructs of qualified expert DCF, DDM, and RIM valuation models. Qualified experts include Damodaran (2012), Koller et al. (2010), Lundholm and O'Keefe (2001), Ohlson (1995), and Pignataro (2013).

Data Collection Technique

Accounting and financial statement data of participating companies, as collected from public company filings with the SEC from 2009 through 2013, functioned as input data used in spreadsheet valuation models. All financial statement data and stock market data of participating companies are historical, and thus not influenced by recently disseminated information. Moreover, use of a 21-day average of common stock prices in the study to derive the market value of equity mitigated daily stock market price fluctuations (Reddy et al., 2013). All accounting and financial statement data collected for the study, all spreadsheet valuation models developed, and all SPSS statistical analysis results will remain stored in secured electronic file folders or a locked file cabinet. All of the study data are available to the editor and qualified researchers for review during the publication process and for five years after that. Research data storage and retention practices comply with APA Ethics Code Standards 8.14(a). Moreover, data storage and retention meet the requirements of Sharing Research Data for Verification 6.01, and Documentation of Professional and Scientific Work and Maintenance of Records (APA, 2011).

Ratio scale variables of accounting and financial statement data of participating companies included earnings before interest and taxes, depreciation, and amortization. Other ratio scale variables in the study were cash balances, capital expenditures, taxes, current assets and current liabilities, the book value of equity, debt, lease obligations, and nonoperating assets. The common stock-related information used in the study included equity market prices, dividends, net income, and stock repurchases. Historical 10-year U.S. Treasury bond rates or 10-year Canadian government bond rates were proxies for the risk-free rates used in the CAPM for formulating the cost of equity. The U.S. Treasury bond rates were a 21-day average post-release of participating companies' annual reports by the SEC, as reported by the Board of Governors of the Federal Reserve System or The Bank of Canada. Government-issued 10-year and 30-year bonds were sound proxies for the risk-free rate, due to their high degree of liquidity (Koller et al., 2010). Moreover, government bonds have a low probability of default and easily match corporate bond term and rates, as used for determining the cost of debt estimates (Damodaran, 2012). Similarly, common stock information needed to tabulate regression beta coefficients were historical stock prices and market index prices. All of the input variables used in the valuations were dollar denominated ratio scales of measurement. Valuation results using four valuation methods and the book value of equity were dollar denominated ratio scales of measurement and were the independent variables used in statistical analysis. The participating company historic market value of equity was dollar-denominated ratio scales of measurement that were the dependent variables used in statistical analysis. Accounting and financial statement data of participating companies were input variables of valuation models. The accounting and financial statement information was appropriate for the study, as the data reflect firm performance that corresponds to company value.

Transposition of accounting and financial statement data into valuation spreadsheet models permits calculation of estimated equity value results. Valuation results represent estimations of firm equity value and are a function of the macroeconomic environment, firm historical financial performance, and anticipated future firm performance. Similar past research that compared valuation model results to the market value of equity was a study by Feltham and Ohlson (1995). They examined the relationship between accounting information relating to operating and financial activities and company market value. In a related study, Hwang and Lee (2013) undertook an analysis of the residual income valuation model, by using public company financial statement data and comparing model results with related stock prices of sample firms. In other related studies, Belo et al. (2013), Francis et al. (2000), Jennergren (2008), and Hwang and Lee (2013) examined the relationship between valuation model results and the market value of equity of sampled companies. The findings of these related studies suggest that a robust relationship exists between valuation model results and market value of equity.

The study research question was: Which of four valuation models, combined with company book value of equity, is most accurate in determining the market value of equity of commercial finance companies? In their comparison of the DDM and RIM valuation models, Penman and Sougiannis (1998) used accounting and financial statement data of sample companies taken from COMPUSTAT Annual and Research files. COMPUSTAT, now known as S&P Capital IQ, is a McGraw Hill Financial, Inc. online financial data service. COMPUSTAT provides financial data of listed companies on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and the National Association of Securities Dealers Automated Quotations (NASDAQ). In an examination of the DDM, DCF, and discounted abnormal earnings valuation models, Francis et al. (2000) obtained accounting and financial statement data of sample companies from *Value Line.* Value Line is an online research library of listed companies.

The accounting and financial information available in S&P Capital IQ and Value Line are also available on EDGAR and SEDAR online databases.

The EDGAR and SEDAR online databases allow for a straightforward transposition of accounting and financial statement data of participating companies into spreadsheet models. The EDGAR and SEDAR online databases archive quarterly and annual financial reports and other required public disclosure documents of reporting companies. Historical stock prices and the market value of equity of participating companies are available for data collection from various financial websites. Financial websites include Yahoo Finance, Macroaxis, Inc., and YCharts, NYSE, and NASDAQ Exchanges, Reuters, and Morningstar, Inc. The Board of Governors of the Federal Reserve System (FRB) provides public access to its Selected Interest Rates (Daily) H.15 website. Risk-free interest rates used in valuation modeling are available from the FRB H.15 site. Standard & Poors' Capital IQ Bond Research website includes loan default spreads of rated companies. Loan default spreads are input variables in company valuation models.

Because the common stock of participating companies' trade in public markets, laws of the U.S. or Canada require that participating companies periodically file financial reports that include annually audited financial statements. Companies listed in the U.S. are legally required to comply with the U.S. Securities and Exchange Commission's (SEC) filing requirements. Canadian public companies are subject to the regulatory authorities of the Canadian Securities Administrators (CSA). The CSA encompasses the British Columbia Securities Commission, Alberta Securities Commission, Ontario Securities Commission and Autorité des marchés financiers, who represent stakeholders of thirteen Provincial and Territorial securities regulatory authorities located in Canada. Regulatory requirements of listed companies include annual filing of independently audited statements of financial condition. Moreover, U.S.-listed companies are subject to regulatory requirements of The Sarbanes-Oxley Act of 2002, also known as the Public Company Accounting Reform and Investor Protection Act. The Act further regulates company compliance of periodic statutory financial reporting.

Advantages of collecting financial statement data of participating companies via EDGAR and SEDAR are ease of access to, and quality or accuracy of, financial statement data. Regulatory requirements for filing only quarterly and annual financial statement data are a key disadvantage for research that requires interim monthly financial information. Interim monthly financial data are not available for review through EDGAR and SEDAR.

The study described here did not include a pilot study phase. Company valuations performed, the book value of equity, and the market value of equity of participating companies relate to past financial performance, combined with future expected performance. The study did not include estimations of current company value and related stock price estimations. Therefore, stakeholders of participating companies are not vulnerable to potential investment price risk, because the study findings related to historical stock prices, rather than to current stock prices. Possible benefits of the study exceeded the potential risks of the study.

Password and encryption protected file storage of participating companies' electronic annual and quarterly filings, as retrieved from EDGAR or SEDAR, on Google Drive cloud electronic file storage provided adequate record keeping and data retention.

Transposition of participating companies' accounting and financial statement data into spreadsheet valuation models, as stored in password and encryption protected Google Drive file folders, afforded adequate protection of study data. Study data retention and data sharing conformed to APA guidelines. Therefore, data will be retained and available for review for a minimum of five years from the date of publication of the study (APA, 2011).

Data Analysis

The research questions addressed in this study were as follows.

1. What is the accuracy of a DCF valuation model, combined with company book value of equity, for predicting the market equity value of commercial finance companies?
2. What is the accuracy of a risk-adjusted DCF valuation model, combined with company book value of equity, for predicting the market equity value of commercial finance companies?
3. What is the accuracy of a DDM, combined with company book value of equity, for predicting the market equity value of commercial finance companies?
4. What is the accuracy of an RIM, combined with company book value of equity, for predicting the market equity value of commercial finance companies?

The null hypotheses and alternative hypotheses of this doctoral study were as follows.

$H_0$1: The linear combination of DCF valuation model results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$1: The linear combination of DCF valuation model results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$2: The linear combination of risk-adjusted DCF valuation model results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$2: The linear combination of risk-adjusted DCF valuation model results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$3: The linear combination of DDM valuation results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$3: The linear combination of DDM valuation results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

$H_0$4: The linear combination of RIM valuation results and company book value of equity will not significantly predict the market value the equity of commercial finance companies.

$H_1$4: The linear combination of RIM valuation results and company book value of equity will significantly predict the market value the equity of commercial finance companies.

The valuation models used in this study incorporated cost of equity estimations. The cost of equity estimations are synonymous with expected return on equity investments, as determined using the CAPM (Olweny, 2011). The CAPM formulation requires the inclusion of stock betas as a measurement of the market risk of the underlying equity securities (Festel et al., 2013). A linear regression analysis of changes in the participating companies' historical stock price, relative to changes in the S&P500 Stock Index, provides an estimation of the firms' beta coefficient (Damodaran, 2012). For Canadian participating companies, the TSX Index represents a market proxy. In this study, the weighted average of participating companies' calculated regression stock beta was an estimate or surrogate of the industry beta for the commercial finance industry (Damodaran, 2012). Use of industry beta in the CAPM reduces the noise inherent in time-series data relating to individual company betas (Donovan & Nuñez, 2012).

Accounting and financial statement information of participating companies included input data in four different valuation models for five-year consecutive intervals. The study also included comparisons of the relationship of company valuation results of four valuation models and book value of equity to the market value of equity through statistical analysis of multiple linear regression. Valuation results, combined with company book value of equity, were regressed against company market value of equity. Standard multiple regression analysis provided the means to measure the relationship between valuation model accuracy and company book value in significantly predicting market capitalization. A statistical assumption of multiple linear regression is that the dependent variable has a normal distribution in the population (Green & Salkind, 2011). Another statistical assumption of multiple regression is that population variances of the dependent variable are similar for all levels of the independent variable (Green & Salkind, 2011). Further assumptions of multiple regression are that cases are random samples, and the scores of cases are independent of one another (Green & Salkind, 2011). Multiple regression requires an assumption of a linear relationship between predictor and outcome variables (Boslaugh, 2013). There is also the assumption that errors of prediction are constant over the entire range, as homoscedastic data add to statistical assumptions of multiple linear regression (Boslaugh, 2013). The Durbin-Watson test is a methodology for testing the serial independence and normality of prediction errors (Bercu & Proia, 2013).

The paired-samples *t*-test is a statistical analysis method for measuring the mean difference between two variables of the same case (Green & Salkind, 2011). A match-subject paired *t*-test evaluates the mean difference between two variables for studies of matched-subject designs (Green & Salkind, 2011). For a two-tailed test, a test result is significant where the *p*-value is less than .05. *P*-values less than .05 support rejecting the null hypothesis, that there is no significant relationship between the mean values of valuation model results, company book value of equity, and the market value of equity of commercial finance companies. A one-sample *t*-test examines the difference between the mean of the test variable and a constant variable (Green & Salkind, 2011). The underlying statistical assumptions of a one-sample *t*-test are that the test variable has a normal distribution similar to the population and that study cases represent a random sample of the population (de Winter, 2013). Moreover, an assumption of the one-sample *t*-test is that scores of test variables are independent of one another (Green & Salkind, 2011).

Use of a constant variable, such as the aggregate market capitalization of all commercial finance companies, was valueless for this study, because the mean population valuation of all commercial finance companies was not relevant to the study. Knowledge of the mean value of aggregated commercial finance companies does not provide managers insight into valuation models that accurately value individual commercial finance companies. Moreover, the participating companies do not represent a random sampling of the population, because they are firms that fit prescribed criteria. Additionally, independence of scores of valuations of participating companies from four different valuation models was unlikely, because the four valuation models use common input data. Finally, a comparison of discrete mean values of all commercial finance companies was not the purpose of this study. Therefore, a one-sample *t*-test was an inappropriate statistical methodology to use in the study.

The independent samples *t*-test compares the means of two unrelated groups (Boslaugh, 2013). Statistical assumptions of the independent sample *t*-test are that the test variables have a normal distribution and have equal variances (Green & Salkind, 2011). Other assumptions of the independent sample *t*-test are that cases represent a random sample of the population and scores of test variables are independent of one another (Green & Salkind, 2011). Under conditions that satisfy statistical assumptions, the two-tailed independent samples *t*-tests are reasonably robust for discerning Type I and Type II errors for sample sizes larger than 24 (Menon, Massaro, Pencina, Lewis, &

Wang, 2013). A Type I error is rejecting the null hypothesis when the null hypothesis is true, and a Type II error is failing to reject the null hypothesis when the null hypothesis is false (Boslaugh, 2013). The independent samples *t*-test includes a Levene's test for equality of variances or *F* test that evaluates the assumption of equal population variances of the two groups tested. An *F* value with significance less than 0.05 indicates that equal variances were not an assumption in the calculation of *t*-test statistics. The two sets of *t*-test statistics represent either equal variance assumed or equal variances not assumed. A *p*-value less than a 0.05 significance level supports rejecting the null hypothesis. The independent samples *t*-test was not compatible with the analysis undertaken in this study, as participating companies undergo retesting at different time intervals using differing valuation methodologies. Independence of test and retest results are unlikely for participating companies, because of continuity of the business enterprises. Additionally, mean differences in valuation methods are not mutually exclusive, because valuation model results represent discrete participating company valuations. Moreover, variances of participating company valuations violate the assumption of being equal or normally distributed, as a prerequisite to using an independent samples *t*-test. Therefore, the independent samples *t*-test was an inappropriate statistical methodology for this study.

The Pearson correlation coefficient is a measure of the linear relationship between two interval variables (Boslaugh, 2013). Statistical assumptions of the Pearson correlation coefficient are that test variables have a bivariate normal distribution, and cases represent a random sampling of the population (Green & Salkind, 2011). Moreover, statistical assumptions include the notion that scores of variables in separate cases are independent of one another (Green & Salkind, 2011). A bivariate normal distribution of scores on variables refers to the joint probability of two normally distributed random variables. The bivariate correlation between variables, otherwise known as the Pearson correlation, indicates the significance of the correlation between two variables (Green & Salkind, 2011). Significant correlations at the .05 level are *p*-values less than .05 that support rejecting the null hypothesis. The Bonferroni approach is a method used to reduce the chances of a Type I error, by correcting the significance level via dividing .05 by the number of comparison correlations (Green & Salkind, 2011). The Pearson correlation coefficients statistical method is suitable for determining the accuracy of valuation model results, relative to the market value of equity. The Pearson correlation coefficients may provide a measurement of the relative relationship between valuation models, book value of equity, and market value of equity. Intuitively, all firm valuation models correlate to market capitalization, because each is a function of firm performance. Strong correlations between a particular valuation model and firm market capitalization are not an indication of valuation model accuracy, but merely an indication that model results and market capitalization have a linear relationship.

An analysis of variance *ANOVA* is a statistical procedure for comparing mean values of variables (Boslaugh, 2013). A one-way ANOVA was an appropriate statistical procedure for use in this study, due to similarities to the match subject paired *t*-test. The statistical assumptions of ANOVA are that the dependent variable has a normal distribution for each population, and the variances of the dependent variable are the same for all populations (Green & Salkind, 2011). Other assumptions of ANOVA are that cases represent random samples from the population, and scores on the dependent variable are independent of one another (Green & Salkind, 2011).

In this study, the dependent variables were the historic market value of equity of participating companies' 10-days ex-post release of annual financial statement data obtained from SEC 10-K filings for years 2009 through 2013. ANOVA statistics are useful for assessing whether variable means are significantly different among groups (Green & Salkind, 2011). The market values of equity of participating companies are independent of each other, as the financial performance of each company does not depend on the financial performance of other participating companies. A posthoc Dunnett's test is appropriate for a pairwise comparison of dependent variable scores in the event that scores of the dependent variables have unequal variances (Koenig, Brannath, Bretz, & Posch, 2008). The Dunnett's test includes the use of a control variable to avoid making a Type I error (Koenig et al., 2008). Use of the Kolmogorov-Smirnov test validates that the dependent variables do or do not have a normal distribution (Boslaugh, 2013).

A one-way ANOVA calculates mean, standard deviation, the sum of squares, mean squares, *F*-value, *p*-value, and critical *F*-value. The ANOVA *F*-statistic is the ratio of the sum of squares between and within groups (Boslaugh, 2013). The total sum of squares is equal to the sum of squares between groups, plus sum of squares within groups. The *F*-value is the sum of squares between groups, divided by its degrees of freedom, divided by the sum of squares within groups, divided by its degrees of freedom. In this study, groups were participating company valuations, using one of four valuation models and market value of equity. Conversely, groups can represent mean participating company values and book value at different periods, using each of four different valuation models. The rejection region is an *F*-value greater to the critical *F*-value. An

F-value in the rejection region supports rejecting the null hypothesis while an *F*-value that falls outside the rejection region supports failing to reject the null hypothesis. The *p*-value represents the probability that the *F*-value is equal to or greater than the critical *F*-value. A *p*-value result of the ANOVA analysis that is less than a 0.05 significance level value further supports rejecting the null hypothesis. The linear combination of each of four valuation model results, combined with company book values of equity that are not accurate in predicting the value of equity of participating companies at a *p*-value less than 0.05 significance level, supports rejecting the null hypotheses.

Multiple linear regression analysis examines the linear relationship between two or more predictor (independent) variables and an outcome (dependent) variable (Green & Salkind, 2011). The multiple regression correlation, denoted as *R*, is an index reflecting the strength of the relationship between predictor variables and the outcome variable (Boslaugh, 2013). The squared multiple coefficients of determination (R^2) denotes the explained variation in observed values, divided by the total variation in observed values. The R^2 is a measure of the goodness of fit in multiple regression between independent variables and the dependent variable. Similarly, the standard error signifies the average variation of observed values from the regression line (Maraun, Gabriel, & Martin, 2011). The standard error may be the result of randomness, such as nonsystematic variation of observed values (Maraun et al., 2011). The *p*-value statistic for each predictor or independent variable represents the probability that variations of the predictor variable relate to the variation in the outcome or dependent variable. A low *p*-value indicates that changes in the predictor variable relate strongly to changes in the outcome variable, while a large *p*-value indicates that changes in the predictor variable do not relate to changes in the outcome variable. A *p*-value less than .05 indicates a statistically significant relationship. Therefore, at the 0.05 significance level, a *p*-value less than .05 supports rejecting the null hypothesis.

In this study, the four valuation models and the book value of equity served as predictors of the market value of equity of participating companies. Also, the market value of equity of the participating companies was an estimation of true value (outcome). Each of the four valuation models is a mathematical construct. Valuation results reflect the use of accounting and financial statement data of participating companies in valuation models. Although relative input variables differ among the four valuation models, each model includes input data that represent the financial performance of the participating companies. As such, a valuation result (predictor variable) of any particular valuation model highly correlates with the results of the other valuation models. Therefore, valuation model results represent a multicollinearity scenario that may distort the standard errors in statistical analysis. Additionally, the purpose of conducting multiple linear regression analysis is to determine the relative predictiveness of independent variables to an outcome or dependent variable. The examination undertaken in this study sought to reveal the predictiveness of various valuation models, combined with book value, to determine the market value of equity. Thus, multiple linear regression analysis was a suitable statistical analytical methodology for this study.

The multiple linear regression analysis included the use of bootstrapping with 2,000 bootstrap samples. Bootstrapping re-samples sample data, with replacement, in an attempt to provide refinement of the distribution function. As such, it smooths realized regression and covariance coefficients (Dovonon, Gonçalves, & Meddahi, 2013). Bootstrapping improves the quality of an inference of a sample to the population.

Statistical analyses were performed using the IBM Statistical Package for Social Sciences SPSS version 21 *SPSS*, G*Power software version 3.1.9.2 *G*Power* and Microsoft Excel software version 14.0.7128.5000 *Excel*. SPSS permits associated statistical analysis by performing simple and multiple regression analysis. Excel's Data Analysis feature supports linear regression analysis as needed to estimate firms' beta coefficients. G*Power provides a means of determining required sample size and performing the effect size analysis.

Study Validity

External Validity

Validity refers to an instrument's ability to measure attributes of the study's constructs (Walls et al., 2011). Threats to external validity affect the extent to which inferences made from a study are generalizable to other groups (Khorsan & Crawford, 2014). Multiple-occasions reliability, otherwise known as test-retest reliability, tests the similarly of an instrument's outcome when repeatedly administered (Boslaugh, 2013). In this study, the use of four valuation methodologies to value eight participating companies were retested by performing identical valuations for five consecutive years. Thus, each valuation model underwent 40 retests in the valuation calculation process. The coefficient of stability test that computes the correlation coefficient between scores of each instrument provides a means for assessing multiple-occasions reliability.

Random sampling provides all members of the population an equal chance of selection and inclusion in a study (Khorsan & Crawford, 2014). Nonrandom sampling threatens external validity through sampling bias (Konisky & Reenock, 2013) and by impeding comparison and aggregation of research findings across different studies. Moreover, sample size affects the statistical power of inferential testing (Boslaugh, 2013), where small sample size increases the probability of a Type I error. In this study, participating companies did not represent a random sample of the population of commercial finance companies and comprised a small sample size compared to the population size. However, the inclusion of all commercial finance companies that fit the selection criteria moderated researcher bias in participant sample selection. Small sample size may cause an inability to detect non-normality or inequality of variances or may not have sufficient power to detect differences among samples. Moreover, a small sample size may not generate a significant *F* test, if sample variance is large (Green & Salkind, 2011). However, a formidable relationship exists between firm performance and market capitalization and between firm performance and valuation model results (Hitchner, 2011). The formidable relationship is due to strong correlations between firm performance measures of operating income and cash flow from operations and firm value (Zarb, 2014). Therefore, small sample variances, as determined in the study, mitigate the small sample size of participating companies.

The notion of specificity of variables refers to the degree or level of variable facets and dimensions, as reflected in the number of sources of variation in a variable (Yager, 2012). An alternative description of specificity of variables is where the variation of variables prevents generalization (Benge, Onwuegbuzie, & Robbins, 2012). Other variable facets are where variables include independent variables, dependent variables, and instruments used in a study (Benge et al., 2012). All variable data utilized in this study were ratio, continuous, data derived or collected from accounting and financial statement information of participating companies that are input data for mathematical models. Input data, independent variables, dependent variables, instruments, and modified instruments used in this study represent standardized norms that are generalizable to the general population of commercial finance companies. As such, the specificity of variables was not a threat to external validity.

Reactive effects of experimental arrangements refer to participants' awareness of being subjects of an experiment that influenced participant reactions via their perceptions of the experimenter's intent (Benge et al., 2012). While reactive effects of experimental arrangements are threats to external validity, the notion was not applicable in this study, because the study did not involve human subjects. Similarly, testing reactivity is a threat to external validity, where testing refers to changes in participants' responses, resulting from exposure to preintervention instruments or post-intervention measures (Benge et al., 2012). Testing reactivity was not an applicable threat in this study, because no human subjects were involved.

Multiple treatment interference represents a threat to external validity, where researchers apply several treatments together that cause difficulty in determining the effects of each treatment individually (Plavnick & Ferreri, 2013). Alternatively, multiple treatment interference is the result of one intervention as a consequence of influences by other interventions (Mechling, Ayres, Foster, & Bryant, 2014). In this study, valuations of participating companies were undertaken using four different valuation models, for five consecutive yearly periods. The occurrence of each valuation was independent of all other valuations. Because individual valuations occurred only once, no threat of multiple treatment interferences affected the study results.

Internal Validity

Internal validity supports the notion that observed covariation correlates to a causal relationship (Rockers, Røttingen, Shemilt, Tugwell, & Bärnighausen, 2014). Specifically, internal validity denotes that the propositions or conclusions of a study, based on a sample, are valid for the target population (Bleijenbergh, Korzilius, & Verschuren, 2011). Threats to internal validity include history, maturation, testing, instrumentation, statistical regression, experimental mortality, and selection-maturation interaction (Coryn & Hobson, 2011). Historical threats to internal validity represent the passage of time during the study, where events may unduly influence outcomes. In this study, all accounting and financial data used in valuation models, the book value of equity, and the market capitalization data employed were historical information. In an attempt to negate the ill effects of the 2008 economic recession, input data used in the study were from post-recession years 2009 through 2013. Therefore, history did not pose a credible internal validity threat in the study.

As a threat to internal validity, testing refers to changes in participants' scores on instruments, due to preintervention or pretesting (Woodman, 2014). Mitigants to testing threats to internal validity include time intervals between interventions and use of differing instruments for each intervention. In this study, participating companies were unaware of the study. Therefore, they could not influence outcomes of interventions through their memory of prior interventions, and testing was not a threat to internal validity.

As another threat to internal validity, instrumentation refers to issues arising from inconsistent or invalid instrument scores (Ihantola & Kihn, 2011). Changes to instruments or conditions between tests may cause inconsistent scores, and, thus, may be a threat to internal validity (Walser, 2014). The consistent use of uniform instruments under similar conditions mitigates the instrumentation threat to internal validity. In this study, four valuation models were the instruments used. Use of four valuation model instruments, as created in Excel spreadsheets, ensured identical testing instrumentation, and consistent use of valuation assumptions abated the instrumentation threat to internal validity.

Statistical regression may be a threat to internal validity when extreme scores or deviant scores from the mean increase the probability of test result error (Becker, Rai, Ringle, & Völckner, 2013). Regression threat increases when the basis of subject selection is extreme scores and when subsequent subject outcomes are less extreme (Walser, 2014). One way to mitigate regression threat is the use of cohort study participants, where such participants have similar characteristics (Walser, 2014). Participating companies utilized in this study were mature organizations of the same industry with similar organizational operations. Although a comparison of the relative size and scope of participating companies revealed significant variation, the expected disparity between each participating company's financial performance and its value were marginal. Moreover, participants with extreme or outlier data were not included in the final statistical models, in order to reduce the threat to internal validity. Therefore, statistical regression did not pose a threat to internal validity.

Experimental mortality refers to subject attrition, where study participants fail to participate in part or all of the study (Ihantola & Kihn, 2011). Bias is inevitable, due to a loss of study participants, unless participant attrition causes discrepancy among groups that appreciably influences treatment outcomes (Penny & Atkinson, 2012). The participating companies in this study were participants throughout the duration of the study, with one exception. One of the participating companies was not a publically listed corporation in 2009 and 2010. Therefore, accounting and financial statement data for that company are only available for years 2011, 2012, and 2013. An absence of historical data for any one participating company did not adversely affect the results of the study. The robustness of the valuation analysis in the study mitigated any ill effect related to loss of historical data of one participating company.

Selection-maturation interaction refers to threats to internal validity associated with study participants that have a higher rate of maturation than other groups (Penny & Atkinson, 2012). Additionally, selection-maturation manifests via changes in participants, due to the passage of time (Penny & Atkinson, 2012). The passage of time may bring participant changes, such as physical, mental, emotional, and intellectual changes (Benge et al., 2012) that may lead to changes in instrument-related scores. Organizational maturity is the level of maturity relating to an organization's ability to efficiently and effectively deliver on strategic objectives (Taylor, Hanlon, & Yorke, 2013). The average length of time as going concerns of the participating companies was 32 years; ranging from 7 years to 106 years.

Participating companies' boards of directors appoint senior management staff in, compliance with corporate governance guidelines in the Sarbanes-Oxley Act of 2002 or similar regulatory requirements of listed firms in the U.S. or Canada. Experienced and educated board members are a source of competitive advantage via their contributions to the firm (Khanna, Jones, & Boivie, 2014). An assumption of competent management of participating companies, as appointed by the boards of directors, helps negate selection-maturation interaction as a threat to internal validity. While participating companies were all part of the Commercial Finance Industry, each company's equity price volatility, as measured by its stock's beta coefficient, varied from the group mean. Of the participating companies, those firms with relatively high annual revenues had less stock price volatility than those participating companies with comparably low annual revenues. In the event of an outlier participating company whose scores would skew an otherwise normal distribution of the dependent variables, as determined by a *Levene's* test, such participating company would be withdrawn from the study.

A Type I error in the experimental design is rejecting the null hypothesis when the null hypothesis is true (Boslaugh, 2013). The null hypotheses of study are as follows. There is no significant relationship between valuation results of each of four valuation models, combined with the book value of equity, and the market value of equity of participating commercial finance companies. Rejecting any of the four stated null hypotheses concludes that the particular valuation method or methods, combined with book value, are not a suitable valuation methodology for valuing commercial finance companies. A Type I error is a threat to statistical conclusion validity via incorrectly rejecting a null hypothesis that is true. Mitigants to threats to statistical validity include reliability of the instruments used in the study, parametric data assumption testing, and statistically significant power of the sample size of participants employed in the study.

Reliability of instruments refers to measurement instruments that lack ambiguity (Ihantola & Kihn, 2011) and are valid and reliable (Drost, 2011). Instrument reliability requires instruments to yield consistent scores (Benge et al., 2012) and to be appropriate for the research design (Oluwatayo, 2012). Valuation models used in this study were adaptations of models advanced by finance academics and valuation professionals. Finance academics and valuation professionals who influenced the study included Cornell (2013), Damodaran (2012), Hitchner (2011), Koller et al. (2010), and Pignataro (2013). The risk-adjusted DCF valuation model introduced in this study is a derivation of the DCF model advanced by Hitchner (2011). The DCF, DDM, and RIM valuation models have undergone rigorous academic examination and testing. Academic examinations of the DCF, DDM, and RIM valuation models include studies by Francis et al. (2000), Jennergren (2008, 2013), Lundholm (2001), Oded and Michel (2007), and Plenborg (2002). Conclusions of past research of the DCF, DDM, and RIM valuation models are that the models represent reasonably reliable mathematical instruments for business valuation. Obtaining consistent scores via the instruments deployed in the study required uniformity of input accounting and financial statement data of participating companies. Similarly, repeated use of the spreadsheet derived DCF, RADCF, DDM, and RIM models for each participating company ensured consistency, validity, and reliability of instruments utilized in the study.

Data assumption testing refers to statistical model assumptions, such as normality, independence, homogeneity of variance (Benge et al., 2012), and data appropriateness (Boslaugh, 2013). The statistical analyses used in the study included simple linear regression, multiple linear regression, and correlation coefficient analysis of participant firm stock, firm financial information, and valuation model results. Violations of one or more statistical assumptions may cause a Type I error or Type II error.

Linear regression is a statistical methodology used to calculate beta coefficients of time-series equity returns of participating companies, relative to the broader equity markets. Statistical assumptions for linear regression include data appropriateness, independence, linearity, distribution, homoscedasticity, and independence and normality of the errors (Boslaugh, 2013). Outcome variables should be continuous, interval, or ratio, and be unbounded while predictor variables should be continuous or dichotomous (Tsai & Gill, 2013). Predictor variables used in this study included changes in weekly stock prices of participating companies for a five-year period (2009 through 2014). Weekly stock prices are continuous, as stock prices can be any value greater than zero; they are independent of one another. Outcome variables are weekly changes in the Standard and Poor's 500 Index or TSX Index for a five-year period, 2009 through 2014. Weekly changes in the S&P 500 Index and TSX Index are continuous and are linear to changes in the stock prices of the common equity of the participating companies. The outcome variables possess an approximately normal distribution, as outliers represent infrequent events. The assumption of independence and normality of errors infers that the errors of prediction for data points are independent of one another (Van Horn et al., 2012). Verification of the assumption of independence is verifiable via the Durbin-Watson test. The Durbin-Watson test is a statistical method used to reveal autocorrelation from a regression analysis. Durbin-Watson results range from zero to four, with a score of two as an indication of complete independence (Boslaugh, 2013).

G*Power software provides a basis for power and effect-size determination using an estimated large effect size of ($f = .8$), $\alpha = .05$. Accordingly, the minimum sample size needed to achieve a power of .95 is 23. Eight commercial finance companies fit the selection criteria outlined in this study. As such, an estimated large effect size of ($f = .8$), $\alpha = .05$ and a total sample size of 8 produced a statistical power of .50. A statistical power of .05 does not promptly invalidate the results of the statistical analysis (G. Norman, 2010). Power is $1 - \beta$ and indicates the probability of correctly rejecting the null hypothesis (Boslaugh, 2013). Low variability in outcomes increases power. Therefore, statistical analysis results that confirm low variability enhance a low power, by increasing the probability of avoiding a Type I error.

Transition and Summary

Section 2 described the methodology and design of this quantitative, comparative, and correlation study. The role of the researcher underlies key goals of objectivity, detachment, and unbiased analysis of data. Study participants were a sample representation of the population of commercial finance companies, albeit a limited number of participants, based on selection criteria. Quantitative analysis in the study supported a postpositivism worldview of determination and empirical observation and measurement. Statistical analyses used in the study support the research method, design, problem, purpose, and question. Instruments employed addressed reliability and validity. Moreover, the use of sound instruments and application of statistical tests protected against threats to external validity and internal validity.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this quantitative correlational study was to examine the linear relationship between four valuation model results, the book value of equity, and the market value of equity of selected commercial finance companies. The study included an examination of the accuracy of four valuation models and company book value in predicting the market capitalization of participating companies. I used linear regression analysis to determine stock beta coefficients of participating companies. The study design featured multiple regression analysis to determine the linear relationships between the independent variables and the dependent variables. The independent variables are the discounted cash flow (DCF), risk adjusted discounted cash flow (RADCF), dividend discount model (DDM), and residual income model (RIM) valuation model results, and company book value of equity of participating companies. The dependent variables are the market value of equity of participating companies. Data collection was from the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database; the Canadian Securities Regulator's SEDAR database; and from Yahoo Finance.

The findings of the study were that the DCF, RADCF, DDM, and RIM valuation models were, when combined with the book value of equity, statistically accurate in predicting the market value of equity of participating commercial finance companies. The DDM and RIM valuation models were statistically accurate in predicting the market value of equity of participating companies without the inclusion of the predictor book value of equity, $p = .000$, and $p = .000$, respectively (see Table 3). However, the DCF and RADCF valuation models were not statistically accurate in predicting the market value of equity participating commercial finance companies without the inclusion of the predictor book value of equity, p = .170, and p = .880, respectively (see Table 3).

Table 3

Summary Findings of DFC, RADCF, DDM, and RIM Valuation Model Results in Predicting the Market Value of Equity of Participating companies

	Ranked					95% Confidence Interval[b]	
Valuation Model[a]	Order	R^2	*t*	*p*[b]	*beta*[b]	Lower	Upper
DDM	1	.986	48.04	.000	.993	.874	1.012
RIM	2	.929	20.75	.000	.964	.921	1.236
DCF	3	.056	1.403	.170	.237	-.140	.609
RADCF	4	.001	-.152	.880	-.026	-.289	.404

a. Valuation model results without the inclusion of book value of equity in the statistical analysis
b. Bootstrap results based on 2,000 bootstrap samples

Presentation of the Findings

Cost of Capital and Equity Betas

The valuation models used in this study required the use of discount rates to determine the present value of future cash flows or dividends. Discount rates are the tabulated cost of capital of the participating companies. The capital asset pricing model (CAPM) used to tabulate the cost of equity required an equity beta coefficient for each participating company, for each valuation period. Individual company beta estimations often exhibit relatively high standard errors, whereas industry or sector beta estimations exhibit low standard errors (Damodaran, 2012). The sector beta is a cross section of stock price volatility of all types of listed commercial finance companies, including companies specializing in accounts receivable factoring and working capital financing. Accounts receivable factoring and working capital financing are short-term financing products where commercial finance company borrowers pledge short-term assets. Short-term portfolio risks correspond to the creditworthiness of the borrower's customers rather than the creditworthiness of the Borrower.

This doctoral study focused on commercial finance companies with relatively large term loan portfolios where borrowers pledge medium- to long-life assets to support medium- to long-term loans. As such, the sector beta coefficient does not distinctively represent the stock price volatility of the participating commercial finance companies. An averaging of comparable firms' betas is superior to industry betas where companies within an industry have dissimilar operating risks (Koller et al., 2010). Therefore, a weighted average of the participating companies' equity betas is a surrogate for the sector beta of the industry for commercial finance companies with relatively large term loan portfolios. Regression analysis of changes in a company's historical stock prices, relative to changes in the historical S&P 500 indices, resulted in a firm's equity beta coefficient (Frazzini & Pedersen, 2014).

The dependent variables in this study consisted of five years of weekly changes in each participating company's historical stock prices. The independent variables are changes in historical S&P 500 indices for US participating companies and historical TSX indices for Canadian participating companies. *Yahoo Finance* and *TMX Money* made available dependent and independent variable data.

The theoretical framework of the CAPM provided a useful tool for estimating investors' expected return on equity investments. Dempsey (2013) argued that empirical evidence negate the efficacy of the CAPM as a measure of relative risk. Similarly, Fama and French (2012) argued that the CAPM was inferior to other measures of cost of capital because it does not include factors of firm size and value. However, Brown and Walter

(2013) supported the use of the CAPM by researchers and practitioners due to its inherent intuitiveness as a measure of investor expected returns. The findings of this doctoral study support the validity of the CAPM as a measure of the cost of equity when applied using the DDM and RIM valuation models. The relative accuracy of the DDM and RIM valuation models in valuing commercial finance companies confirms the validity of the CAPM as a measure of the cost of equity.

Pseudonyms for the names of the two Canadian and six U.S. participating commercial finance companies used in the study were CFCP1, CFCP2, CFCP3, CFCP4, CFCP5, CFCP6, CFCP7, and CFCP8. The linear regression program in SPSS was used to determine each participating companies' equity beta for each valuation. Equity beta is a measure of the risk of a firm relative to a market index (Damodaran, 2012). This study includes an examination of equity betas and their impact on a firm's cost of equity. Equity alpha is the difference between a portfolio's expected return and its actual return (Damodaran, 2012). An underlying assumption in this study of a baseline stock alpha of zero negates the need to tabulate stock alphas. Table 4 shows summary statistics of participating company CFCP1 for 2009. Table 5 displays the coefficients of changes in CFCP1's share prices, compared to changes in the TSX Index.

Table 4

Model Summary Statistics of CFCP1

					Change Statistics[a,b]					
Model	*R*	R^2	Adjusted R^2	*SE*	R^2 Change	*F* Change	*df1*	*df2*	Sig. F Change	Durbin-Watson
1	.116[a]	.013	.010	.03249053	.013	3.529	1	258	.061	2.470

a. Predictors: (Constant), TSX Changes in Composite

b. Dependent Variable: CFCP1 Change in Stock Prices

Table 5

Coefficients of Changes in CFCP1 Stock Price and Changes in the TSX Index

Model	Unstandardized Coefficients[a]		Standardized Coefficients[a]			95.0% Confidence Interval for B	
	Beta	Std. Error	Beta	*t*	*p*	Lower Bound	Upper Bound
1 (Constant)	.000	.002		-.228	.820	-.004	.004
TSX Changes in Composite	.125	.067	.116	1.879	.061	-.006	.257

a. Dependent Variable: CFCP1 Change in Stock Prices

The study included a standard linear regression analysis, α = .05 (two-tailed), which was undertaken to examine the relationship between changes in CFCP1's weekly stock prices and changes in the TSX Index. The independent variables were percentage changes in the weekly TSX Index. The dependent variables were percentage changes in CFCP1's weekly stock price. The study included a preliminary analysis to assess if violations of assumptions of a linear relationship, multivariate normality, no or little multicollinearity, no autocorrelation, and homoscedasticity existed. Analysis during the study uncovered one serious violation of the assumptions. Regression results were not significant $F(1, 258) = 3.529$, $p = .061$, $R^2 = .013$. The $R^2 = .013$ value indicated that approximately 1.3% of variations in CFCP1's stock price related to its linear relationship with the TSX Index (predictor variable). In the final model, changes in CFCP1's stock prices were not statistically significant with changes in the TSX Index, beta = .116, $p = .061$. The unstandardized beta coefficient, beta = .125, represents CFCP1's equity beta as used in the CAPM.

Test of assumptions. A scatterplot of the values of the dependent variable (weekly percentage changes in CFCP1's stock prices) and the values of the independent variable (weekly percentage changes in the TSX Index) indicated reasonable linearity. Testing for an assumption of normality as conducted via an examination of unstandardized residuals. The Shapiro-Wilk test $SW = .854$, $df = 260$, $p = .000$, skewness = .023, and kurtosis = 6.401 statistics suggested a relatively non-normal distribution. The boxplot had outliers that suggested a non-normal distribution shape of the residuals. A scatterplot indicated a relatively random display of points, suggesting evidence of independence. The Durbin-Watson statistic of 2.470 further supported an assumption of independence and no autocorrelation. The spread of residuals in the scatterplot appeared consistently constant for the values of the independent variable, supporting homogeneity of variance.

Table 6 provides summary statistics of a linear regression analysis resulting in company equity betas for seven of eight participating companies for 2009. Of the eight participating companies, company CFCP3 did not have publically traded stock in 2009 and 2010. For companies listed in the U.S., percentage changes in weekly stock prices were regressed against percentage changes in the weekly S&P 500 Index. The study did not include the results of similar linear regression of participating companies for years 2010 through 2013 for review, for reasons of thriftiness of space. With the exception of one of the participating companies, the percentage changes in weekly company stock prices did not have a normal distribution. Violation of the assumption of normality does not invalidate *p*-values (Green & Salkind, 2011).

Table 6

Summary Statistics of Linear Regression of Seven-Participating companies for 2009

Company[a]	*F*	R^2	p^b	β^c	*D-W*	*S-Wp*
CFCP1	(1, 258) = 3.529	.013	.061	.125	2.470	.000
CFCP2	(1, 15) = 1.855	.110	.193	1.040	2.776	.128
CFCP4	(1, 171) = 35.145	.170	.000	1.380	1.985	.000
CFCP5	(1, 258) = 36.038	.123	.000	1.983	2.357	.000
CFCP6	(1, 258) = 5.853	.022	.016	.399	2.381	.000
CFCP7	(1, 171) = 62.309	.267	.000	2.227	2.112	.000
CFCP8	(1, 258) = 67.935	.208	.000	1.324	2.177	.000

a. Dependent Variables: Company Change in Stock Prices
b. Predictors: (Constant) TSX Changes in Index or S&P500 Changes in Index
c. Unstandardized Beta Coefficients

The R^2 of the regression is an estimate of the percentage of systemic risk relating to market forces (Damodaran, 2012). The purpose of including equity beta coefficients in the CAPM was to account for systemic risk. The weighted average of all participating companies' equity beta coefficients accounted for systemic risk across all participating companies. Therefore, weighted average beta coefficients were the betas used in the CAPM to tabulate the cost of capital. Practitioners and academics typically undertake a process of unlevering industry betas, based on total industry leverage, and re-levering unlevered betas according to a particular company's capital structure (Hitchner, 2011). However, valuation practitioners prefer using industry levered betas in the CAPM to determine the cost of equity of financial services companies, where unlevering and relevering are unnecessary (Koller et al., 2010). The rationale for using industry-levered betas for financial service companies is because, unlike nonfinancial companies, debt is similar to raw material inventory (Damodaran, 2012). Financial services firms use debt as a means of making new loans; therefore, debt is not merely a form of capitalization (Damodaran, 2012). Consequently, the beta coefficient is not levered to reflect the financial leverage of specific financial services companies.

Table 7 shows the results of linear regression derived equity betas of participating companies and the weighted average of company betas for 2009 through 2013. The market capitalization of participating companies was the source of weights in the determination of weighted averages.

Table 7

Equity Betas and Weighted Average Equity Betas of the Eight Participating companies

	2009	2010	2011	2012	2013
CFCP1Beta (CAN)	0.1255	0.0985	0.1037	-0.0078	0.0638
CFCP2 Beta	1.0408	1.1131	1.2809	1.2845	1.2377
CFCP3 Beta (CAN)[a]	N/A	N/A	0.6367	0.1208	0.4345
CFCP4 Beta	1.3802	1.3206	1.2504	1.2206	0.9761
CFCP5 Beta	1.9834	1.9201	1.8510	1.9339	0.9612
CFCP6 Beta	0.3997	0.4508	0.4185	0.4205	0.3472
CFCP7 Beta	2.2272	2.3519	2.0279	2.0251	1.6351
CFCP8 Beta	1.3237	1.2861	1.2542	1.2191	0.9812
Weighted Average Betas	1.1689	1.2235	1.2886	1.2603	1.0428

[a] CFCP3 was not a publically listed company until 2011.
Note. The regression results listed are equity betas (unstandardized coefficients) tabulated in Excel.

Market Risk Premium

The market risk premium (MRP), as used in the CAPM, is a risk premium above the risk-free rate (Zabarankin, Pavlikov, & Uryasev, 2014). The MRP reflects yields expected by investors for equity investments that are subject to systemic risk (Zabarankin et al., 2014). A common method for determining the MRP is subtracting the average return on a market portfolio of equity securities by the average risk-free rate (Damodaran, 2012). Valuation practitioners and academics typically use the S&P500 Index as a surrogate for a market portfolio of equity securities. The average return of the S&P500 Index from May 2005 through May 2015 was 8.28% per annum. A similarly derived average yield on the 20-year U.S. Treasury bond during the same period was 2.79% per annum.

This study did not include detailed calculations of the average returns of the S&P500 Index and risk-free rates for review. The tabulated MRP of 5.49% is the sum of the average return of the S&P500 Index of 8.28%, less an average risk-free rate of 2.79%. The *Implied Equity Premium* (IEP) is an alternative methodology for tabulating the MRP that does not assume that the market correctly prices stocks (Damodaran, 2012). The IEP derives MRP by solving for the required return on equity that corresponds to the market value of all stocks (Damodaran, 2012). IEP estimations include expected future dividends and the expected growth rate in earnings and dividends (Damodaran, 2012). The implied equity risk premiums used in the study were 4.36% (2009), 5.20% (2010), 6.01% (2011), 5.78% (2012), and 4.96% (2013), respectively. This study did not include calculations of the IEPs for review.

Table 8 shows the cost of capital results of the CAPM for each participating company for years 2009 through 2013. Equation 2 is a formulaic expression of the Sharpe-Lintner CAPM formula used to calculate the cost of equity. Differences in the CAPM results reflect differences in the 30-year average risk-free rate.

Table 8

Calculated Cost of Capital (Ke) using an Implied Equity Premium in the CAPM

Participating Company	2009	2010	2011	2012	2013
CFCP1	9.15%	10.11%	10.40%	9.85%	8.15%
CFCP2	9.80%	10.86%	11.01%	10.45%	8.79%
CFCP3	9.15%	10.11%	10.40%	9.85%	8.15%
CFCP4	9.26%	10.87%	11.07%	10.33%	8.76%
CFCP5	9.77%	10.87%	11.08%	10.42%	8.78%
CFCP6	9.80%	10.87%	10.94%	10.22%	8.70%
CFCP7	9.78%	10.87%	11.07%	10.22%	8.76%
CFCP8	9.08%	10.65%	10.36%	10.87%	8.52%

Cost of Debt and Weighted Average Cost of Capital

The yield to maturity of comparably rated term bond issues served as surrogates of the cost of debt for participating companies. For participating companies with nonrated debt, a synthetic rating estimate provided the basis for comparison of rated bond issues (Damodaran, 2012). The market value of debt and the market value of equity were weights in the WACC formulation. Equation 13 is a formulaic expression of the WACC.

Table 9 illustrates the tabulated WACC for participating companies for years 2009 through 2013.

Table 9

Tabulated WACC of Participating companies for 2009-2013

Participating Company	2009	2010	2011	2012	2013
CFCP1	5.49%	6.42%	7.10%	5.86%	5.53%
CFCP2	10.67%	8.71%	8.23%	8.15%	6.65%
CFCP3[a]	N/A	N/A	9.92%	7.20%	6.99%
CFCP4	6.30%	8.88%	9.78%	9.31%	8.25%
CFCP5	7.51%	8.16%	9.25%	10.02%	8.63%
CFCP6	4.24%	5.10%	6.24%	6.12%	5.25%
CFCP7	10.00%	8.18%	6.81%	6.40%	6.13%
CFCP8	3.51%	3.83%	2.83%	4.08%	3.70%

[a] CFCP3 was not a publically listed company until 2011

The theoretical framework of the WACC is that it is a valid estimator of the cost of capital. As such, the WACC is an appropriate discount rate when discounting the estimated future cash flows of the firm (Damodaran, 2012). Similarly, Grüninger and Kind (2013) advanced the goodness of the WACC, when correctly estimated, as an accurate measurement of a firm’s cost of capital. Grüninger and Kind (2013) concluded that the correct cost of debt in the WACC is a risk-free after-tax rate multiplied by a debt beta coefficient. Debt betas reflect risks associated with financial leverage (van Binsbergen et al., 2011). However, financial leverage at lending institutions does not directly correlate to firm risk, as debt is used to fund loans to third party borrowers (Damodaran, 2010). Subsequently, debt is not a source of capital and should not be included in the cost of capital (Damodaran, 2012). The pretax cost of debt used in the study was market interest rates of similarly risky bond issues. The study findings do not support or refute the goodness of the WACC as a valid measure of the cost of capital of commercial finance companies. The relative inaccuracy of the DCF and RADCF models used to value the participating companies may or may not be the result of an inaccurate cost of capital via the WACC. Further research into the applicability of the DCF and RADCF as valid valuation models for valuing commercial finance companies is necessary to determine the accuracy of the WACC as a measure of the cost of capital.

Growth Estimates

Financial projections provided the cash flow input variables used in the valuation models employed in this study. Participating company historical financial statements and future growth estimations served as the financial underpinnings of the tabulated financial projections. Growth rates of nonfinancial companies denote growth in revenues, earnings, or free cash flows (Ashton & Wang, 2013). The focus of growth of financial services companies is growth in assets; particularly growth in portfolio assets (Dermine, 2010). The methodology used to estimate asset growth in this study was a weighted average of seven growth rate indicators. Growth rate indicators are industry growth rate estimates provided by the trade associations of the equipment finance industry and commercial finance industry. Other growth rate indicators are economy growth estimations provided by the U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, and the World Bank. Participating companies' year-over-year historical growth rates in assets were another growth rate indicator included in the growth rate model. Appendix A shows the tabulated growth rates for CFCP1, included here for illustration purposes. The study did not include detailed tabulated growth rates of the other participating companies for review. Table 10 is a summary of tabulated growth rate estimates for participating companies for the years 2009 through 2013.

Table 10

Calculated Asset Growth Rate Estimates for 2009-2013

Company	2009	2010	2011	2012	2013
CFCP1	-6.06%	3.42%	1.96%	4.95%	2.70%
CFCP2	-9.76%	0.73%	4.04%	3.94%	4.16%
CFCP3	-7.58%	6.35%	5.55%	47.92%	15.39%
CFCP4	-8.85%	-1.37%	4.14%	9.60%	11.90%
CFCP5	-11.08%	1.51%	7.30%	7.18%	4.59%
CFCP6	-5.09%	3.80%	5.98%	5.11%	3.61%
CFCP7	-8.69%	1.22%	5.02%	7.71%	8.62%
CFCP8	-7.46%	4.65%	0.99%	-6.86%	-0.02%

Note. The differences in growth rates among participating companies reflect differing geographic markets, industry concentrations, business focus, and average loan size per customer.

Table 11 is a summary of tabulated growth rate estimates for the participating companies for the years 2014 through 2018.

Table 11

Calculated Asset Growth Rate Estimates for 2014-2018

Company	2014	2015	2016	2017	2018
CFCP1	3.24%	2.78%	2.92%	2.39%	2.37%
CFCP2	4.19%	3.78%	3.97%	3.19%	3.17%
CFCP3	3.24%	2.78%	2.92%	2.39%	2.37%
CFCP4	4.19%	3.78%	3.97%	3.19%	3.17%
CFCP5	4.37%	3.96%	4.15%	3.37%	3.35%
CFCP6	4.19%	3.78%	3.97%	3.19%	3.17%
CFCP7	4.19%	3.78%	3.97%	3.19%	3.17%
CFCP8	0.03%	3.78%	3.97%	3.19%	3.17%

The asset growth rate estimates were input variables in the formulation of proforma balance sheets and income statements of participating companies. Appendix B shows the proforma balance sheets of CFCP1 participating company. Appendix C shows the proforma income statements of CFCP1. For review for reasons of thriftiness of space, the study does not include proforma balance sheets of all other participating companies for all other proforma years and income statements for all other years participating companies for review.

Clean Surplus Accounting

The proforma-derived FCFF, dividends, and residual incomes used in terminal value estimations in the valuation models underwent adjustments to conform to clean surplus accounting. Appendix G shows the clean surplus accounting adjustments to

FCFF for terminal value calculations for CFCP1. Appendix G shows the clean surplus accounting adjustments to terminal value residual income and dividends for CFCP1. The study did not include, for review, the clean surplus accounting adjustments to FCFF for the other participating companies, or of clean surplus accounting adjustments to residual income and dividends of participating companies. For purposes of thriftiness of space, the study does not include all of the accounting adjustments for review.

DCF Valuation Model

There were four sets of hypotheses in this study. The first hypothesis dealt with the accuracy of a DCF valuation model, combined with book value, in predicting the market value of firm equity of participating companies. In a multiple regression analysis, DCF valuation models results and firm book values, where the independent variables and firm market value of equity were the dependent variables. Appendix I is a summary of the DCF valuation calculations for CFCP1 for 2009, provided for illustration purposes. Table 12 is a summary of the DCF valuation results for the eight participating companies. Table 12 also shows the market value of equity of participating companies and DCF valuation model results as a percentage of market value of equity, otherwise known as market capitalization.

The mean tabulated DCF valuation of participating companies was $2,074,406.10 U.S. dollars. The mean book value of participating companies was $6,163,744.90. The mean market value of equity was $3,525,454.30. The mean tabulated value of equity, derived by use of the DCF valuation model, was 58.8% of the market value of equity of participating companies. The mean book value was 174.8% of the market value of equity. Mean tabulated DCF valuation model results equal to 100% of the market value of equity indicate a valuation model with near perfect predictability.

Table 12

DCF Valuation Model Results of Participating companies, Market Value of Equity, and DCF Valuation Model Results as a Percentage of Market Capitalization

Company	2009	2010	2011	2012	2013
CFCP1 DCF Valuation Results	46,354	60,390	69,707	26,949	39,008
CFCP1 Market Capitalization	43,281	60,286	54,580	61,908	76,953
DCF Valuation % of Mkt. Cap.	107.10%	100.17%	127.71%	43.53%	50.69%
CFCP2 DCF Valuation Results	-154,384	-337,918	16,382,455	7,210,741	9,726,260
CFCP2 Market Capitalization	7,583,350	8,363,838	8,088,627	8,611,611	9,648,520
DCF Valuation % of Mkt. Cap.	-2.04%	-4.04%	202.54%	83.73%	100.81%
CFCP3[a] DCF Valuation Results	N/A	N/A	N/A	-111,254	-175,537
CFCP3 Market Capitalization	N/A	N/A	N/A	710,009	2,361,691
DCF Valuation % of Mkt. Cap.	N/A	N/A	N/A	-15.67%	-7.43%
CFCP4 DCF Valuation Results	8,143	217,957	264,238	396,070	398,022
CFCP4 Market Capitalization	66,971	115,869	118,041	277,761	252,722
DCF Valuation % of Mkt. Cap.	12.16%	188.11%	223.85%	142.59%	157.49%
CFCP5 DCF Valuation Results	138,089	102,389	233,727	354,799	436,963
CFCP5 Market Capitalization	104,751	132,761	166,686	247,304	283,979
DCF Valuation % of Mkt. Cap.	131.83%	77.12%	140.22%	143.47%	153.87%
CFCP6 DCF Valuation Results	469	20,055	81,833	103,982	131,777
CFCP6 Market Capitalization	39,558	55,535	91,504	108,323	112,743
DCF Valuation % of Mkt. Cap.	1.19%	36.11%	89.43%	95.99%	116.88%
CFCP7 DCF Valuation Results	467,632	-101	297,717	606,623	435,997
CFCP7 Market Capitalization	316,671	524,364	516,176	670,298	702,697
DCF Valuation % of Mkt. Cap.	147.67%	-0.02%	57.68%	90.50%	62.05%
CFCP8 DCF Valuation Results	-10,897,493	-17,685,708	-16,695,318	-749,377	12,247,814
CFCP8 Market Capitalization	3,960,560	5,407,556	5,112,497	9,078,158	10,789,884
DCF Valuation % of Mkt. Cap.	-275.15%	-327.06%	-326.56%	-8.25%	113.51%

[a] CFCP3 was not a publically listed company until 2012.
Note: Valuation results and market capitalization values are in thousands of dollars.

Table 13 displays the results of an ANOVA analysis of variance of the book value of equity and the DCF valuation results to the market value of equity of participating companies. Table 14 shows the results of a bootstrap for coefficients of DCF valuation results and the book value of equity of participating companies. Bootstrap results represent 2,000 bootstrap samples. Table 15 shows the results of an analysis of coefficients of DCF valuation results and book value to equity to the market value of equity of participating companies.

Table 13

ANOVA Analysis of Variance of DCF Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

	Model[a,b]	*df*	*SS*	*MS*	*F*	*p*
1	Regression	2	393013584594111.940	196506792297055.970	131.985	.000[b]
	Residual	32	47643578240344.860	1488861820010.777		
	Total	34	440657162834456.800			

[a] Dependent Variable: Market Value

[b] Predictors: (Constant), Book Value, DCF

Table 14

Bootstrap for Coefficients of DCF Valuation Model Results and Book Value of Equity of Participating companies

			Bootstrap[a]				
						95% Confidence Interval	
Model		*B*	*Bias*	*SE*	*p* (2-tailed)	Lower	Upper
1	(Constant)	288920.724	-44143.675	138440.960	.152	1712.821	537510.544
	DCF	.234	.014	.078	.040	.136	.435
	Book Value	.517	.023	.076	.012	.448	.726

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Table 15

Coefficients of DCF Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

Model[a]		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	*SE*	*Beta*	*t*	*p*	Tolerance	*VIF*
1	(Constant)	288920.724	243468.269		1.187	.244		
	DCF	.234	.035	.399	6.755	.000	.970	1.031
	Book Value	.517	.033	.928	15.726	.000	.970	1.031

a. Dependent Variable: Market Value

A multiple regression analysis, α = .05 (two-tailed), provided an examination of the efficacy of DCF valuation model results and the book value of equity in predicting the market value of equity. The independent variables were DCF valuation model results and the book value of equity of participating companies. The null hypothesis was that the linear combination of the DCF valuation model results and company book value of equity would not significantly predict the market value of the equity of commercial finance companies. The alternative hypothesis was that the linear combination of the DCF valuation model results and company book value of equity would significantly predict the market value of the equity of commercial finance companies. A preliminary analysis was undertaken to assess whether or not the variables met the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. The cases of the study had one violation of the parametric assumptions (see Test of Assumptions). The final analysis did not include the case causing the violation. The model as a whole was able to significantly predict market value of equity of participating companies, $F(2, 32) = 131.985$, $p = .000$, $R^2 = .892$. The R^2 (.892) value indicated that approximately 89.2% of the variations of the market value of equity of participating companies related to the linear combination of the predictor variables. The predictor variables were the DCF valuation model results and the book value of equity of participating companies.

In the final model, the book values of equity of participating companies were significant (beta = .928, p = .012), while the DCF valuation model results were not significant (beta = .399, p = .040) predictors of market value of equity. The DCF valuation model results did not significantly account for the variation in the market value of equity of participating companies. Moreover, the tabulated Pearson correlation coefficient of .237 indicates a relatively weak linear relationship between DCF valuation model results and the market value of equity. The results of the statistical analysis of the final model support rejecting the null hypothesis. However, LeMire (2010) suggested using caution when drawing inferences from the statistical results of the final model based on knowledge of the subject matter constructs.

The theoretical framework of the DCF valuation model is that firm value is the discounted value of future expected free cash flows discounted at the firm's cost of capital (Cogliati, Paleari, & Vismara, 2011). Koller et al. (2010) and Damodaran (2012) advised against using the enterprise DCF valuation model for valuing financial services firms. Koller at al. (2010) recommended using an equity DCF valuation model while Damodaran (2012) suggested using either the DDM valuation model or an equity DCF valuation model. Damodaran (2012) argued that the inability to determine net working capital, capital expenditure, and reinvestment amounts at financial services firm prohibited the use of the enterprise DCF valuation model. This doctoral study included the use of the enterprise DCF valuation model with an estimation of reinvestment amounts representing monies needed to fund loan portfolios.

Francis et al. (2000) examined the relative accuracy of the DDM, DCF, and RIM valuation models. Francis et al. (2000) referred to the DCF valuation model as the discounted free cash flow model. Francis et al. (2000) found that the discounted free cash flow model explained 35% of the variation in current stock prices of the 300 sampled publically traded companies. However, a finding from this doctoral study was that the DCF valuation model results explained 5.6% of the variation in market value of equity of the seven participating companies. The study findings of inaccurate DCF valuation model results reinforce earlier research that concluded an incompatibility of the enterprise DCF valuation model for valuing financial services firms. However, further research may find a compatible modified enterprise DCF valuation model for valuing commercial finance companies.

Test of assumptions. A comparison of the independent variables, DCF valuation model results to the book value of equity of participants companies, resulted in a collinearity statistic tolerance of .970 for both independent variables. The tolerance is significantly greater than .02, which indicates nonmulticollinearity. Moreover, a comparison of the independent variables resulted in a VIF of 1.031 for both variables. A VIF of less than 10 indicates nonmulticollinearity. Finally, a comparison of the independent variables led to a condition index of 1.234 and 1.840 respectively for the DCF valuation model results and the book value of equity. A condition index less than 10 further supports nonmulticollinearity of the independent variables. A test of correlation, using a Pearson correlation analysis among the independent variables and the dependent variable, resulted in correlation coefficients of .237 for the DCF valuation model results and .859 for the book values of equity. The further a correlation coefficient is from +1 or -1, the weaker the correlation. The tabulated correlation coefficient of the book values of equity indicated a close correlation between book values and the market values of equity. The tabulated correlation coefficient of the DCF valuation model results indicated a weak correlation with the market values of equity. The correlation coefficients tabulated support nonsingularity of the variables.

The scatterplot, as shown in Figure 1, indicated a relatively random display of points, suggesting evidence of independence. The Durbin-Watson test resulted in a statistic of 1.240; supporting an assumption of independence and positive autocorrelation. The spread of residuals in the scatterplot appeared consistently constant for the values of the independent variable, which supports homogeneity of variance. Moreover, the spread of residuals of the independent variables indicated reasonable linearity. However, the boxplot had outliers, suggesting a non-normal distribution shape of the residuals. The outlier variables were a result of including independent and dependent variables relating to one participating company. The company became a listed company in publically traded stock markets in 2012. Moreover, the company underwent significant organizational changes and several acquisitions in 2012 and 2013. Removal of variable data relating to the outlier company ensured no outlier data in the regression analysis.

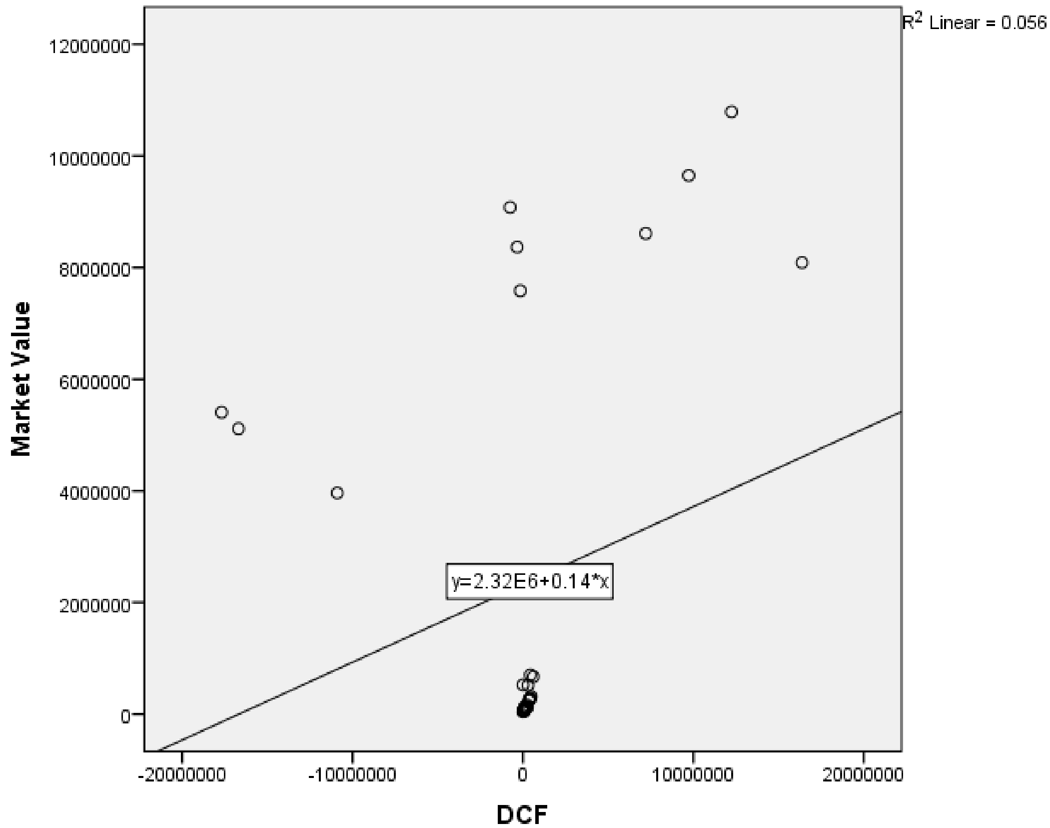

Figure 1. Scatterplot of the DCF model valuation results to market value of equity of participating companies.

Risk-Adjusted DCF Valuation Model

The second hypothesis dealt with the accuracy of an RADCF valuation model, combined with the book value of equity, in predicting the market value of equity of participating companies. In a multiple regression analysis, the RADCF valuation model results and book values of equity where the independent variables and the market value of equity were the dependent variables. Eight participating companies underwent an RADCF valuation for years 2009 through 2013. The RADCF valuation model utilized weighted average industry beta coefficients that represent loan portfolio concentrations. In the RADCF valuation model, the weighted average industry betas of portfolio concentrated industries, combined with commercial finance industry betas, replaced commercial finance industry betas used in the CAPM. Appendix D shows the industry concentrations within the loan portfolio of CFCP1, for years 2009 through 2013. Appendix E shows the industry concentration weighted adjusted beta and related cost of capital of CFCP1. Appendix H provides an example of the process used in tabulating the portfolio risk adjustments of the RADCF valuation model. The study did not include industry concentrations and industry concentration weight adjusted betas and cost of capital for the other participating companies for review.

Appendix H shows the RADCF valuation model calculations for CFCP1, for 2009, as provided for illustration purposes. Table 16 shows the RADCF valuation model results for the eight participating companies. Table 16 also shows the market value of equity of participating companies and RADCF valuation model results as a percentage of market value of equity, otherwise known as market capitalization.

Table 16

RADCF Valuation Model Results of Participating companies, Market Value of Equity, and RADCF Valuation Model Results as a Percentage of Market Capitalization

Company	2009	2010	2011	2012	2013
CFCP1 RADCF Valuation Results	27,311	26,506	39,033	5,668	24,081
CFCP1 Market Capitalization	43,281	60,286	54,580	61,908	76,953
RADCF Valuation % of Mkt. Cap.	63.10%	43.97%	71.52%	9.16%	31.29%
CFCP2 RADCF Valuation Results	-4,099,550	-7,362,313	7,232,192	2,669,318	7,936,889
CFCP2 Market Capitalization	7,583,350	8,363,838	8,088,627	8,611,611	9,648,520
RADCF Valuation % of Mkt. Cap.	-54.06%	-88.03%	89.41%	31.00%	82.26%
CFCP3[a] RADCF Valuation Results	N/A	N/A	N/A	-261,468	-308,580
CFCP3 Market Capitalization	N/A	N/A	N/A	710,009	2,361,691
RADCF Valuation % of Mkt. Cap.	N/A	N/A	N/A	-36.83%	-13.07%
CFCP4 RADCF Valuation Results	-23,059	152,700	186,620	294,245	317,039
CFCP4 Market Capitalization	66,971	115,869	118,041	277,761	252,722
RADCF Valuation % of Mkt. Cap.	-34.43%	131.79%	158.10%	105.93%	125.45%
CFCP5 RADCF Valuation Results	66,549	65,843	168,127	289,440	384,526
CFCP5 Market Capitalization	104,751	132,761	166,686	247,304	283,979
RADCF Valuation % of Mkt. Cap.	63.53%	49.60%	100.86%	117.04%	135.41%
CFCP6 RADCF Valuation Results	-8,644	3,002	47,233	73,257	105,085
CFCP6 Market Capitalization	39,558	55,535	91,504	108,323	112,743
RADCF Valuation % of Mkt. Cap.	-21.85%	5.40%	51.62%	67.63%	93.21%
CFCP7 RADCF Valuation Results	97,673	-525,681	-192,234	149,969	73,829
CFCP7 Market Capitalization	316,671	524,364	516,176	670,298	702,697
RADCF Valuation % of Mkt. Cap.	30.84%	-100.25%	-37.24%	22.37%	10.51%
CFCP8 RADCF Valuation Results	-11,257,977	-23,496,944	-17,883,242	-3,759,198	11,691,624
CFCP8 Market Capitalization	3,960,560	5,407,556	5,112,497	9,078,158	10,789,884
RADCF Valuation % of Mkt. Cap.	-284.25%	-434.52%	-349.79%	-41.41%	108.36%

[a] CFCP3 was not a publically listed company until 2012.

Note: Valuation results and market capitalization values are in thousands of dollars.

The mean tabulated RADCF valuation of participating companies is 787,435.1. The mean book value of equity of participating companies is 6,163,744.9. The mean market value of equity is 3,525,454.3. The mean tabulated value of equity derived by use of the RADCF valuation model is 22.3% of the market value of equity of participating companies. The mean book value of equity of participating companies is 174.8% of the market value of equity. Mean tabulated RADCF valuation results equal to 100% of the market value of equity indicates a valuation model with near perfect predictability.

Table 17 illustrates the results of an ANOVA of the book value of equity and RADCF valuation model results to the market value of equity of participating companies. Table 18 shows the results of a bootstrap for coefficients of RADCF valuation model results and the book value of equity of participating companies. Bootstrap results represent 2,000 bootstrap samples. Table 19 shows the results of an analysis of coefficients of RADCF valuation model results and the book value of equity to the market value of equity of participating companies.

Table 17

A*NOVA Analysis of Variance of RADCF Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies*

	Model[a,b]	*df*	*SS*	*MS*	*F*	*p*
1	Regression	2	367153455765102.60	183576727882551.34	79.921	.000[b]
	Residual	32	73503707069354.30	2296990845917.32		
	Total	34	440657162834457.00			

a. Dependent Variable: Market Value

b. Predictors: (Constant), Book Value, RADCF

Table 18

Bootstrap for Coefficients of RADCF Valuation Model Results and Book Value of Participating companies

	Model	*B*	Bootstrap[a] Bias	SE	p (2-tailed)	95% Confidence Interval Lower	Upper
	(Constant)	403268.885	-66023.097	167712.388	.139	53352.465	690717.343
1	RADCF	.193	.025	.119	.106	.010	.438
	Book Value	.546	.039	.105	.013	.460	.819

a. Unless otherwise noted, bootstrap results represent 2,000 bootstrap samples.

Table 19

Coefficients of RADCF Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

	Model[a]	Unstandardized Coefficients *B*	*SE*	Standardized Coefficients *B*	*t*	*p*	Collinearity Statistics Tolerance	*VIF*
1	(Constant)	403268.885	301001.315		1.340	.190		
	RADCF	.193	.045	.332	4.280	.000	.866	1.154
	Book Value	.546	.043	.980	12.638	.000	.866	1.154

a. Dependent Variable: Market Value.

A multiple regression analysis, α = .05 (two-tailed), provided an examination of the efficacy of RADCF valuation model results and the book value of equity of participating companies in predicting the market value of equity. The independent variables were RADCF valuation model results and the book value of equity of participating companies. The null hypothesis was that the linear combination of the RADCF valuation model results and company book value of equity would not significantly predict the market value of the equity of commercial finance companies. The alternative hypothesis was that the linear combination of the RADCF valuation model results and company book value of equity would significantly predict the market value of the equity of commercial finance companies. The study included a preliminary analysis to assess whether the variables met the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. The cases of the study had one violation of the parametric assumptions (see Test of Assumptions). The model as a whole was able to significantly predict market value of equity of participating companies, $F(2, 32) = 79.921$, $p = .000$, $R^2 = .833$. The R^2 (.833) value indicated that approximately 83.3% of the variations of the market value of equity of participating companies related to the linear combination of the predictor variables. The predictor variables were the RADCF valuation model results and the book value of equity of participating companies. In the final model, the book values of equity of participating companies were significant (beta = .980, $p = .013$) predictors of the market value of equity. However, RADCF valuation model results were not significant (beta = .332, $p = .106$) predictors of market value of equity. Therefore, RADCF valuation model results did not provide any significant variation in the market value of equity of participating companies. The *p*-value of the model as a whole was less than the 0.05 significance level. The *p*-value supports rejecting the null hypothesis that the RADCF valuation model results and company book value of equity would not significantly predict the value of equity of commercial finance companies. However, the contribution of the RADCF coefficient, with a *p*-value greater than the 0.05 significance level, was not a significant predictor of the value of equity of commercial finance companies. Moreover, the Pearson correlation coefficient of -.026 indicates a negative linear dependence between RADCF valuation model results and market value of equity. The results of the statistical analysis of the final model supported rejecting the null hypothesis. However, knowledge of the subject matter construct may suggest using caution when drawing inferences from the statistical results of the final model (LeMire, 2010).

The theoretical framework of the RADCF valuation model is the same as the DCF valuation model, except for the inclusion of risk adjustments to cost of equity. The cost of equity adjustments relates to the theoretical framework of the Modern Portfolio Theory, espoused by Markowitz (1952). Markowitz (1952) argued that investors seek an optimal portfolio that maximizes possible expected returns, while simultaneously reducing portfolio risk through diversification. Commercial finance companies may have undiversified loan portfolios due to market niche specialization and related industry concentrations. As such, the cost of equity used in the RADCF valuation model reflects loan portfolio concentrations in various industries.

Commercial finance companies inherently focus on targeting fixed asset intensive borrowers. Fixed asset intensive industries include commercial airlines, manufacturing, transportation, construction, railroads, metals and mining, publishing and printing, and other industries. Initially, I had reasoned that undiversified loan portfolios would lead to higher cost of equity tabulations via higher industry beta coefficients. However, the study findings were that the weighted average industry beta coefficient for the commercial finance industry of 1.197 is equal to the weighted average portfolio industry concentration beta coeffient of 1.197.

An inference is that equity investors of commercial finance companies may contemplate the relative degree of loan portfolio concentration and nondiversification as part of their risk-reward analysis. Alternatively, loan portfolio industry concentration of participating commercial finance companies may be diversified enough to offset investor concern of undiversified loan portfolios. Therefore, investors focus their risk-reward analysis on stock price volatility of commercial finance companies relative to the broader equity market. The differences between RADCF valuation model results and DCF valuation model results reflect the use of participating company portfolio risk-adjusted beta in the CAPM tabulation in the RADCF models rather than an industry beta. The findings of this doctoral study are that the RADCF valuation model results explained less than 1% of the variation in market value of equity of the seven participating companies. The study findings confirm that the RADCF valuation model does not accurately value the equity of commercial finance companies.

Test of assumptions. A comparison of the independent variables, RADCF valuation model results to the book value of participants companies resulted in a collinearity statistic tolerance of .866 for both independent variables. The tolerance is significantly greater than .02, reinforcing the notion of nonmulticollinearity. Moreover, a comparison of the independent variables resulted in a VIF of 1.154 for both variables. A VIF of less than 10 indicates nonmulticollinearity. Finally, a comparison of the independent variables resulted in a condition index of 1.441 and 2.042, respectively. The condition index being less than 10 further supports nonmulticollinearity of the independent variables.

A Pearson correlation analysis provided a test of correlation between the independent variables and the dependent variable. The Pearson correlation analysis produced correlation coefficients of -.026 for the DCF valuation model results and .859 for the book values of equity. A correlation coefficient that is further from +1 or -1 indicates a weaker correlation than a correlation coefficient closer to +1 or -1. The correlation coefficient of the book values of equity indicated strong correlation with the market value of equity. However, the correlation coefficient of the DCF valuation model results indicated a weak negative correlation with the market value of equity. The correlation coefficients tabulated support nonsingularity of the variables.

The scatterplot, as shown in Figure 2, indicated a relatively random display of points, providing evidence of independence. The tabulated Durbin-Watson statistic of .859 further supports an assumption of independence and positive autocorrelation. The spread of residuals in the scatterplot appeared consistently constant for the values of the independent variable, supporting homogeneity of variance. Moreover, the spread of residuals of the independent variables indicated reasonable linearity. However, the boxplot had outliers, suggesting a non-normal distribution shape of the residuals. The outlier variables were the result of the presence of independent and dependent variables relating to one participating company. The company was a newly listed company in publically traded stock markets. Furthermore, the company underwent significant organizational changes and acquisitions since becoming a listed company. Removal of variable data relating to the company ensured that no outlier data were part of the regression analysis.

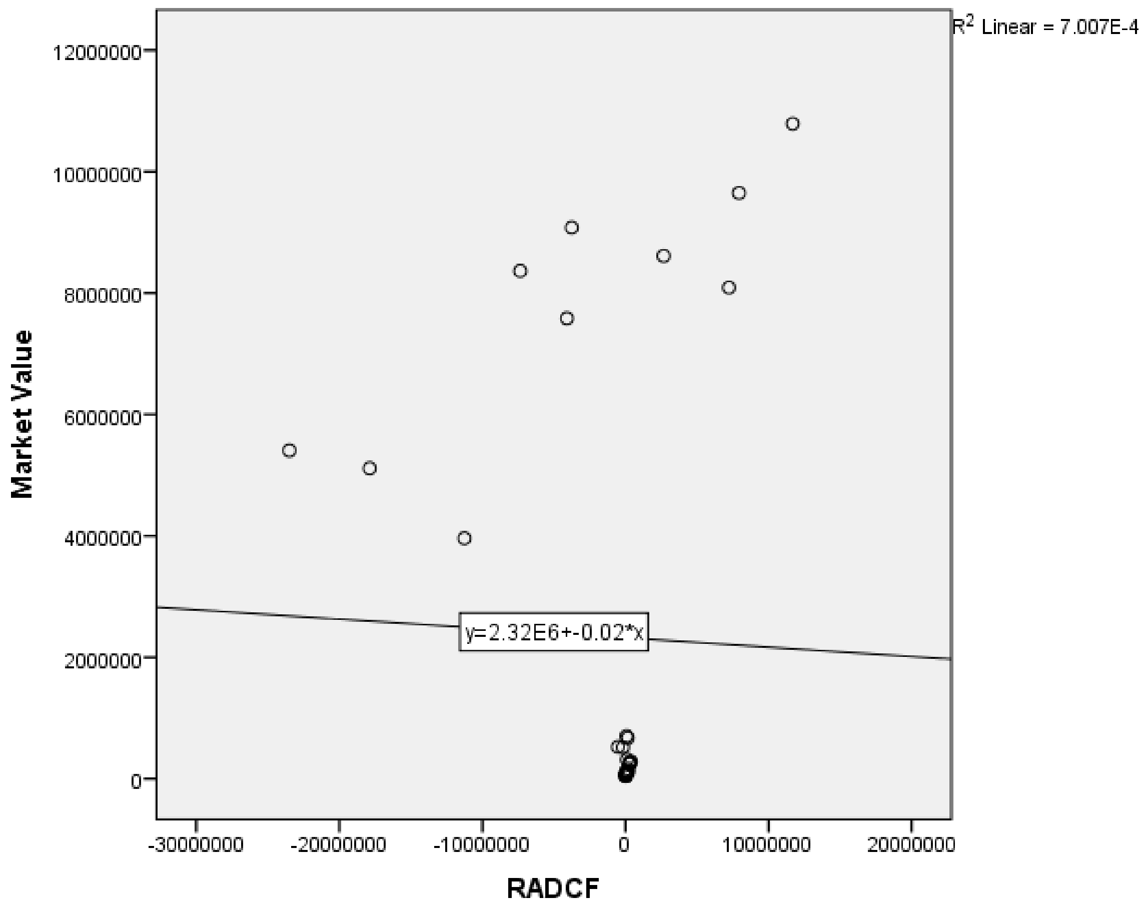

Figure 2. Scatterplot of the RADCF model valuation results to market value of equity of participating companies.

DDM Valuation Model

The third hypothesis concerns the accuracy of a DDM valuation model, combined with the book value of equity, in predicting the market value of equity of participating companies. The study includes multiple regression analysis of DDM valuation model results, combined with firm book values of equity, where the independent variables and firm market value of equity were the dependent variables. Appendix K shows the DDM valuation calculations for CFCP1 for 2009, provided for illustration purposes. Table 20 displays the DDM valuation model results for all eight of the participating companies.

Table 20 also illustrates DDM valuation results, the market value of equity of participating companies, and DDM valuation model results as a percentage of market value of equity, otherwise known as market capitalization.

Table 20

DDM Valuation Model Results of Participating companies, Market Value of Equity, and DDM Valuation Model Results as a Percentage of Market Capitalization

Company	2009	2010	2011	2012	2013
CFCP1 DDM Valuation Results	66,588	82,027	74,582	65,805	73,621
CFCP1 Market Capitalization	43,281	60,286	54,580	61,908	76,953
DDM Valuation % of Mkt. Cap.	153.85%	136.06%	136.65%	106.30%	95.67%
CFCP2 DDM Valuation Results	7,994,475	9,827,052	8,846,553	10,339,492	10,782,287
CFCP2 Market Capitalization	7,583,350	8,363,838	8,088,627	8,611,611	9,648,520
DDM Valuation % of Mkt. Cap.	105.42%	117.49%	109.37%	120.06%	111.75%
CFCP3 DDM Valuation Results	N/A	N/A	N/A	2,415	73,442
CFCP3 Market Capitalization	N/A	N/A	N/A	710,009	2,361,691
DDM Valuation % of Mkt. Cap.	N/A	N/A	N/A	0.34%	3.11%
CFCP4 DDM Valuation Results	90,857	104,511	144,954	249,951	285,925
CFCP4 Market Capitalization	66,971	115,869	118,041	277,761	252,722
DDM Valuation % of Mkt. Cap.	135.67%	90.20%	122.80%	89.99%	113.14%
CFCP5 DDM Valuation Results	126,786	157,105	177,182	230,500	300,188
CFCP5 Market Capitalization	104,751	132,761	166,686	247,304	283,979
DDM Valuation % of Mkt. Cap.	121.04%	118.34%	106.30%	93.21%	105.71%
CFCP6 DDM Valuation Results	37,936	44,372	102,154	128,765	164,919
CFCP6 Market Capitalization	39,558	55,535	91,504	108,323	112,743
DDM Valuation % of Mkt. Cap.	95.90%	79.90%	111.64%	118.87%	146.28%
CFCP7 DDM Valuation Results	265,513	487,469	415,887	590,228	607,039
CFCP7 Market Capitalization	316,671	524,364	516,176	670,298	702,697
DDM Valuation % of Mkt. Cap.	83.84%	92.96%	80.57%	88.05%	86.39%
CFCP8 DDM Valuation Results	3,112,220	5,230,094	5,197,333	9,644,970	9,754,891
CFCP8 Market Capitalization	3,960,560	5,407,556	5,112,497	9,078,158	10,789,884
DDM Valuation % of Mkt. Cap.	78.58%	96.72%	101.66%	106.24%	90.41%

[a] CFCP3 was not a publically listed company until 2012.
Note: Valuation results and market capitalization values are in thousands of dollars.

The mean value of the tabulated DDM valuation model results of the participating companies was 3,772,068.0. The mean book value of equity of participating companies was 6,123,483.3. The mean market value of equity was 3,604,066.1. Notably, the mean value of tabulated DDM valuation model results was 104.7% of the market value of equity of participating companies. However, the mean book value of equity was 169.9% of the market value of equity. Mean tabulated DDM valuation model results equal to 100% of the market value of equity indicated valuation model results with a near perfect predictability.

Table 21 shows the results of an ANOVA analysis of variance of the book value of equity and DDM valuation model results to the market value of equity of participating companies. Table 22 illustrates the results of a bootstrap for coefficients of DDM valuation model results and the book value of equity of participating companies. Bootstrap results represent 2,000 bootstrap samples. Table 23 shows the results of an analysis of coefficients of DDM valuation model results and the book value of equity to the market value of equity of participating companies.

Table 21

ANOVA Analysis of Variance of DDM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

Model[a,b]		*df*	*SS*	*MS*	*F*	*p*
1	Regression	2	438219982989216.100	219109991494608.060	2876.899	.000[b]
	Residual	32	2437179845240.713	76161870163.772		
	Total	34	440657162834456.800			

a. Dependent Variable: Market Value

b. Predictors: (Constant), DDM, Book Value

Table 22

Bootstrap for Coefficients of DDM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

			Bootstrap[a]			
					95% Confidence Interval	
Model	*B*	Bias	*SE*	*p (2-tailed)*	Lower	Upper
1 (Constant)	14472.972	3065.051	19307.918	.570	-19855.918	52327.124
Book Value	.088	.000	.033	.030	.045	.149
DDM	.808	.000	.042	.001	.738	.877

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Table 23

Coefficients of DDM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model[a]	*B*	*SE*	*B*	*t*	*p*	Tolerance	*VIF*
1 (Constant)	14472.972	55986.819		.259	.798		
Book Value	.088	.013	.158	7.039	.000	.343	2.914
DDM	.808	.021	.865	38.543	.000	.343	2.914

a. Dependent Variable: Market Value

A multiple regression analysis, $\alpha = .05$ (two-tailed), provided an examination of the efficacy of DDM valuation model results and the book value of equity in predicting the market value of equity of participating companies. The independent variables were DDM valuation results and the book value of equity of participating companies. The null hypothesis was that the linear combination of the DDM valuation model results and company book value of equity would not significantly predict the market value of the equity of commercial finance companies. The alternative hypothesis was that the linear combination of the DDM valuation model results and company book value of equity would significantly predict the market value of the equity of commercial finance companies. A preliminary analysis was undertaken to assess whether or not the variables met the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. The cases of the study had one violation of the parametric assumptions (see Test of Assumptions). Therefore, the final model did not include the violation case. The model as a whole was able to significantly predict market value of equity of participating companies, $F(2, 32) = 2876.899$, $p = .000$, $R^2 = .994$. The R^2 (.994) value indicated that approximately 99.4% of the variations of the market value of equity of participating companies related to the linear combination of the predictor variables. The predictor variables were the DDM valuation model results and the book value of equity of participating companies. In the final model, book values of equity of participating companies were not significant (beta = .158, $p = .030$), but the DDM valuation model results were significant (beta = .865, $p = .001$) predictors of market value of equity. Therefore, DDM valuation model results led to significant variation in the market value of equity of participating companies. Moreover, the Pearson correlation coefficient of .993 indicated a strong linear dependence between DDM valuation model results and market value of equity. The results of the statistical analysis supported rejecting the null hypothesis.

The theoretical framework of the DDM valuation model is that the value of an equity investment is the discounted value of future expected dividends, discounted at a relevant risk rate of return (Gordon, 1959). Damodaran (2012) and Dermine (2010) argued in favor of the DDM valuation model for valuing the equity of financial services companies. Heinrichs et al. (2013) argued that correcting dirty surplus accounting to achieve clean surplus accounting earnings and related dividends improves the accuracy of

DDM valuation model results (Heinrichs et al., 2013). The study findings affirm that the DDM valuation model accurately values the equity of commercial finance companies. Moreover, dirty surplus accounting corrections to clean surplus accounting further improve DDM valuation accuracy. On average, the DDM valuation model results were equal to 107.5% of the market value of equity of the participating companies. The DDM valuation model results were statistically accurate in predicting the market value of participating companies at the 95% confidence level. Valuing nondividend paying companies using the DDM valuation model requires estimating future expected dividends (Damodaran, 2012).

The forecasted future dividends of the participating companies required estimations based on industry averages or company historical dividend payout ratios. As such, the estimations of future expected dividends may have caused more or less accurate DDM valuation model results. Francis et al. (2000) examined the accuracy of the DDM, DCF, and RIM valuation models. In their study, Francis et al. (2000) used financial data of 300 publically traded companies for years 1989 through 1993. Francis et al. (2000) found that the discounted dividend model explained 51% of the variation in current stock prices of the sampled publically traded companies. The findings of this doctoral study are that the DDM valuation model results explained 98.6% of the variation in market value of equity of the seven participating companies. The larger sample size of the Francis et al. (2000) study may account for the difference in accuracy of the DDM valuation results relative to the participant firm's stock prices.

Test of Assumptions. A comparison of the independent variables, DDM valuation model results to the book value of equity of participants companies resulted in a collinearity statistic tolerance of .343 for both independent variables. The tolerance is significantly greater than .02, further supporting nonmulticollinearity. Moreover, a comparison of the independent variables resulted in a VIF of 2.914 for both independent variables, indicating nonmulticollinearity. Finally, a comparison of the independent variables resulted in a condition index of 2.020 and 4.188, respectively. The resulting condition index further supports nonmulticollinearity of the independent variables. A test of correlation, via a Pearson correlation analysis, among the independent variables and the dependent variable resulted in correlation coefficients of .993 for the DDM valuation model results and .859 for the book value of equity. The tabulated correlation coefficients of the DDM valuation model results and the book values of equity indicated a strong correlation with the market values of equity. The correlation coefficients tabulated supported nonsingularity of the variables.

The scatterplot shown in Figure 3 indicated a relatively random display of points, suggesting evidence of independence. A tabulated Durbin-Watson statistic of 1.749 further supports an assumption of independence and positive autocorrelation. The spread of residuals in the scatterplot appeared consistently constant for the values of the independent variable that confirm homogeneity of variance. Moreover, the spread of residuals of the independent variables indicated reasonable linearity. However, the boxplot had outliers, suggesting a non-normal distribution shape of the residuals. The outlier variables were a result of the inclusion of independent and dependent variables relating to one participating company. The participating company became a listed company in publically traded stock markets in 2012. Moreover, the company underwent significant organizational changes and several company acquisitions in 2012 and 2013.

Removal of variable data relating to the outlier company ensured that no outlier data were part of the regression analysis.

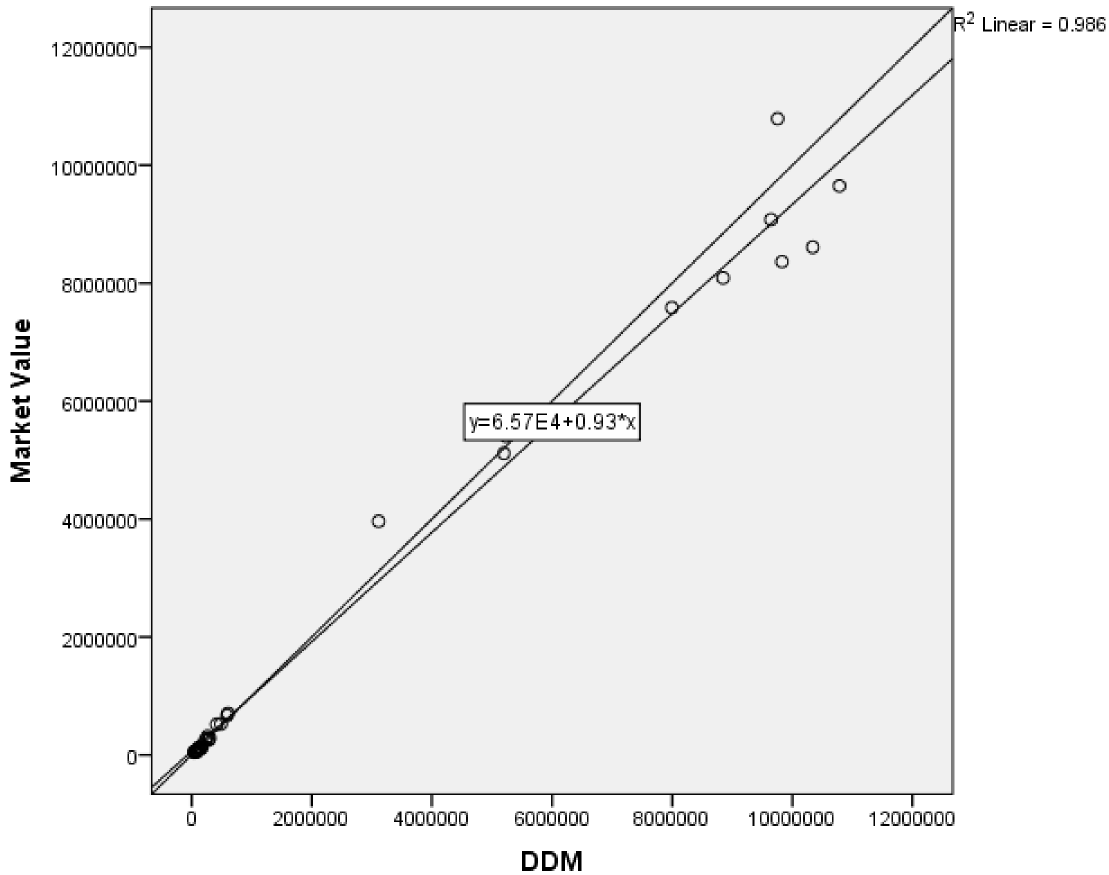

Figure 3. Scatterplot of the DDM Model Valuation Results to Market Value of Equity of Participating companies.

RIM Valuation Model

The fourth hypothesis concerned the accuracy of an RIM valuation model, combined with a book value of equity, in predicting the market value of equity of participating companies. The study included multiple regression analysis of RIM valuation model results, combined with firm book values of equity, to the market value of equity of participating companies. RIM valuation results and the book values were the independent variables used in the analysis. The market values of equity were the dependent variables. Appendix K displays the RIM valuation model calculations for CFCP1 for 2009, as provided for illustration purposes. Table 24 shows the RIM valuation model results for all eight of the participating companies. Table 24 displays the RIM valuation model results, the market value of equity of participating companies, and RIM valuation model results as a percentage of market value of equity, otherwise known as market capitalization.

Table 24

RIM Valuation Model Results of Participating companies, Market Value of Equity, and RIM Valuation Model Results as a Percentage of Market Capitalization

Company	2009	2010	2011	2012	2013
CFCP1 RIM Valuation Results	64,936	80,298	66,794	64,084	71,562
CFCP1 Market Capitalization	43,281	60,286	54,580	61,908	76,953
RIM Valuation % of Mkt. Cap.	150.03%	133.19%	122.38%	103.51%	92.99%
CFCP2 RIM Valuation Results	7,610,280	9,419,957	7,545,203	9,920,677	10,311,881
CFCP2 Market Capitalization	7,583,350	8,363,838	8,088,627	8,611,611	9,648,520
RIM Valuation % of Mkt. Cap.	100.36%	112.63%	93.28%	115.20%	106.88%
CFCP3[a] RIM Valuation Results	N/A	N/A	N/A	-159,778	-477,574
CFCP3 Market Capitalization	N/A	N/A	N/A	710,009	2,361,691
RIM Valuation % of Mkt. Cap.	N/A	N/A	N/A	-22.50%	-20.22%
CFCP4 RIM Valuation Results	83,860	99,671	125,175	243,649	281,141
CFCP4 Fin. Market Capitalization	66,971	115,869	118,041	277,761	252,722
RIM Valuation % of Mkt. Cap.	125.22%	86.02%	106.04%	87.72%	111.25%
CFCP5 RIMValuation Results	120,389	153,477	157,154	224,069	292,523
CFCP5 Market Capitalization	104,751	132,761	166,686	247,304	283,979
RIM Valuation % of Mkt. Cap.	114.93%	115.60%	94.28%	90.60%	103.01%
CFCP6 RIM Valuation Results	35,309	41,376	89,773	124,895	160,356
CFCP6 Market Capitalization	39,558	55,535	91,504	108,323	112,743
RIM Valuation % of Mkt. Cap.	89.26%	74.50%	98.11%	115.30%	142.23%
CFCP7 RIM Valuation Results	240,757	467,405	361,874	568,053	581,817
CFCP7 Market Capitalization	316,671	524,364	516,176	670,298	702,697
RIM Valuation % of Mkt. Cap.	76.03%	89.14%	70.11%	84.75%	82.80%
CFCP8 RIM Valuation Results	2,054,966	3,916,484	2,588,004	8,001,950	6,687,068
CFCP8 Market Capitalization	3,960,560	5,407,556	5,112,497	9,078,158	10,789,884
RIM Valuation % of Mkt. Cap.	51.89%	72.43%	50.62%	88.15%	61.98%

[a] CFCP3 was not a publically listed company until 2012

Note: Valuation results and market capitalization values are in thousands of dollars.

The mean tabulated RIM valuation model result of participating companies was 3,198,101.6. The mean book value of equity of participating companies was 5,969,641.1. The mean market value of equity was 3,509,033.5. The mean tabulated value of equity derived by use of the RIM valuation models was 91.1% of the market value of equity of participating companies. The mean book value of equity was 170.1% of the market value of equity. Mean tabulated RIM valuation model results equal to 100% of the market value of equity indicated a valuation model with near perfect predictability.

Table 25 illustrates the results of an ANOVA analysis of variance of RIM valuation model results and the book value of equity to the market value of equity of participating companies. Table 26 displays the results of a bootstrap for coefficients of RIM valuation results and the book value of participating companies. Bootstrap results represent 2,000 bootstrap samples. Table 27 shows the results of an analysis of coefficients of RIM valuation model results and the book value of equity to the market value of equity of participating companies.

Table 25

ANOVA Analysis of Variance of RIM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

Model[a,b]		df	Sum of Squares	Mean Square	F	p
1	Regression	2	435623990542554.200	217811995271277.100	1384.809	.000[b]
	Residual	32	5033172291902.643	157286634121.958		
	Total	34	440657162834456.800			

a. Dependent Variable: Market Value

b. Predictors: (Constant), RIM, Book Value

Table 26

Bootstrap for Coefficients of RIM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

				Bootstrap[a]			
						95% Confidence Interval	
Model		*B*	Bias	*SE*	*p (2-tailed)*	Lower	Upper
1	(Constant)	2902.548	3823.845	24337.939	.927	-47302.834	46661.564
	Book Value	.195	-.001	.038	.010	.143	.268
	RIM	.757	.003	.050	.001	.667	.856

a. Unless otherwise noted, bootstrap results are based on 2000 bootstrap samples

Table 27

Coefficients of RIM Valuation Model Results and Book Value of Equity to Market Value of Equity of Participating companies

				Standardized				
		Unstandardized Coefficients		Coefficients			Collinearity Statistics	
Model[a]		Beta	*SE*	Beta	*t*	*p*	Tolerance	*VIF*
1	(Constant)	2902.548	80591.957		.036	.971		
	Book Value	.195	.015	.349	12.942	.000	.491	2.037
	RIM	.757	.029	.715	26.511	.000	.491	2.037

a. Dependent Variable: Market Value

A multiple regression analysis, α = .05 (two-tailed), provided an examination of the efficacy of RIM valuation model results and the book value of equity in predicting the market value of equity of participating companies. The independent variables were RIM valuation model results and the book value of equity of participating companies. The null hypothesis was that the linear combination of the RIM valuation model results and company book value would not significantly predict the market value of the equity of commercial finance companies. The alternative hypothesis was that the linear combination of the RIM valuation model results and company book value would significantly predict the market value of the equity of commercial finance companies. A preliminary analysis was undertaken to assess whether or not the variables met the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. The cases of the study initially had one violation of the parametric assumptions (see Test of Assumptions). Therefore, the final analysis did not include the one violation case. The model as a whole was able to significantly predict market value of equity of participating companies, $F(2, 32) = 1384.809$, $p = .000$, $R^2 = .989$. The R^2 (.989) value indicated that approximately 98.9% of the variations of the market value of equity of participating companies related to the linear combination of the predictor variables. The predictor variables were the RIM valuation model results and the book value of equity of participating companies. In the final model, the book values of equity of participating companies were significant (beta = .349, $p = .010$), and the RIM valuation results were significant (beta = .715, $p = .001$) predictors of market value of equity. Therefore, RIM valuation model results and the book value of equity each provided significant variation in the market value of equity of participating companies. Moreover, the Pearson correlation coefficient of .964 indicated a strong linear dependence between RIM valuation model results and market value of equity. The results of the statistical analysis support rejecting the null hypothesis.

The theoretical framework of the RIM valuation model is that the market value of a firm's equity is equal to the firm's current book equity plus the discounted sum of residual income, discounted at the firm's cost of equity (Phansawadhi, 2013). Residual income are earnings in excess of the firm's cost of equity, where cost of equity is the opportunity cost of a similar risk investment (Ohlson, 1995). Francis et al. (2000)

undertook a similar study to examine the relative accuracy of the DDM, DCF, and RIM valuation models. Francis et al. (2000) referred to the RIM valuation model as the discounted abnormal earnings model. In their study, Francis et al. (2000) found that the discounted abnormal earnings model explained 71% of the variation in current stock prices of 300 sampled publically traded companies. The findings of this doctoral study are that the RIM valuation model results explained 92.9% of the variation in market value of equity of the seven participating companies. The smaller sample size in this doctoral study compared to the number of participating companies in the Francis et al. (2000) study may account for the difference in accuracy of the RIM valuation results relative to the participant firm's stock prices.

Test of Assumptions. A comparison of the independent variables, RIM valuation model results, to the book value of equity of participants companies resulted in a collinearity statistic tolerance of .491 for both of the independent variables. The tolerance is significantly greater than .02, which further supports nonmulticollinearity. Moreover, a comparison of the independent variables resulted in a VIF of 2.037 for both variables, indicating nonmulticollinearity. A comparison of the independent variables led to a condition index of 2.010 and 3.285, respectively for the book value of equity and RIM valuation model results. The condition index being less than 10 further supports nonmulticollinearity of the independent variables. A Pearson correlation analysis resulted in correlation coefficients of .964 for the RIM valuation model results and .859 for the book values of equity of participating companies. The tabulated correlation coefficients of the RIM valuation model results and book values of equity further indicate a strong correlation with the market value of equity of participating companies. The correlation coefficients tabulated support nonsingularity of the variables.

The scatterplot, as shown in Figure 4, indicated a relatively random display of points that provide evidence of independence. The tabulated Durbin-Watson statistic of 1.836 further supported an assumption of independence and a slightly positive autocorrelation. The spread of residuals in the scatterplot appeared consistently constant for the values of the independent variable, which supports homogeneity of variance. Moreover, the spread of residuals of the independent variables indicated reasonable linearity. However, the boxplot had outliers, suggesting a non-normal distribution shape of the residuals. The outlier variables were a result of including independent and dependent variables relating to one participating company. The company became a listed company in publically traded stock markets in 2012. Moreover, the company underwent significant organizational changes and several acquisitions in 2012 and 2013. Removal of variable data relating to the outlier company ensured no outlier data were part of the regression analysis.

Participating companies

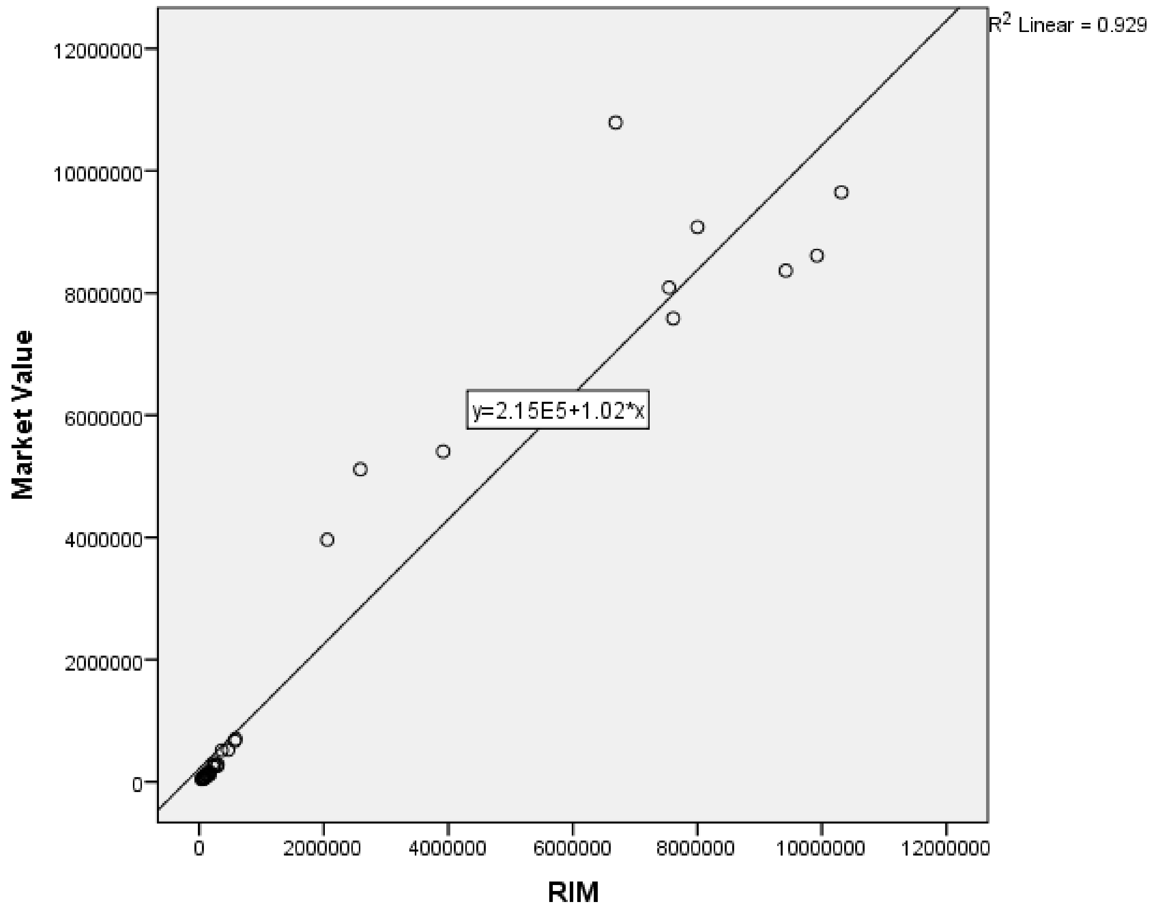

Figure 4. Scatterplot of the RIM model valuation results to market value of equity of participating companies.

Applications to Professional Practice

The findings of this doctoral study may be of value to business leaders, company stakeholders, and members of the community who may benefit from value creation of commercial finance companies. Business leaders utilize organizational systems, supports, and controls to create value (George & Bock, 2011). The valuation process provides business leaders an ability to identify sources of value creation and value destruction within their organizations (Fernández, 2013). By understanding sources of value creation, business leaders may adopt strategies that create value for multiple stakeholders (Tantalo & Priem, 2014).

The findings of this doctoral study provide business leaders and valuation practitioners with knowledge of the accuracy of four valuation methodologies for valuing commercial finance companies. Significant correlations between DDM and RIM valuation model results and market value of equity of commercial finance companies provides evidence as to the legitimacy of using the DDM and RIM valuation models. The use of DDM and RIM by commercial finance companies may reduce overvaluation of merger and acquisition targets and improve the effectiveness of business planning to create value. Business leaders and investors of commercial finance companies may use the DDM and RIM, as modeled in this doctoral study, as a means to determine the effectiveness of management decisions in creating shareholder value.

Additionally, the study included an examination of the DCF and RADCF valuation models. The insignificant correlations between DCF and RADCF valuation model results and market value of equity caution against the use of DCF and RADCF valuation models for valuing commercial companies. The DCF valuation model is the most commonly used estimator of firm value (Oded et al., 2011). However, the findings of this study support the notion that, in its current form, the DCF model does not accurately value commercial finance companies. Business leaders and valuation professionals may avoid inaccurate valuation of commercial finance companies by precluding the use of DCF valuation models.

This doctoral study addresses a gap in the body of knowledge relating to valuing commercial finance companies. Past research identified weaknesses of the DCF valuation model in valuing banking institutions (Dermine, 2010). The findings of this study suggest that DCF valuation models are similarly weak in valuing commercial finance companies. The intent of this study was to contribute knowledge to business leaders and stakeholders of commercial finance companies. The results of the study offer stakeholders information regarding the accuracy of four valuation models, when combined with the book value of equity, in predicting the market value of equity of commercial finance companies.

Implications for Social Change

A positive correlation exists between corporate social responsibility (CSR) activities and firm value for companies with high customer awareness (Servaes & Tamayo, 2013). CSR activities include contributions to sustainable economic development, employees, their families, local communities, and the general society, which lead to quality of life improvements (Servaes & Tamayo, 2013). While firms may choose from a broad array of CSR activities, not all CSR activities equate to the creation of firm value (Peloza & Shang, 2011). Accurate valuation models provide business leaders with the means to measure the effectiveness of CSR activities in creating firm value. The results of this study may contribute to positive social change by providing business leaders with the ability to accurately measure the effectiveness of CSR activities in creating firm value. Business leaders may seek to increase their engagement in CSR pursuits by demonstrating to stakeholders the ability to create value through CSR activities. Business leaders may choose to bridge the gap between business and society by focusing on the creation of shared value (Porter & Kramer, 2011). Shared value occurs when businesses generate economic value in such a way that it also produces value for society (Porter & Kramer, 2011).

Recommendations for Action

The findings of this study validate the accuracy of the DDM and RIM valuation models for valuing commercial finance companies. However, the results of the DDM and RIM valuation models depend on the accurateness of projected future asset growth rates and cost of equity estimations. Moreover, accurate DDM and RIM model results require the use of clean surplus accounting. This study provides a detailed explanation of a methodology for estimating future asset growth rates. Additionally, the study includes detailed formulation of cost of equity estimations. Similarly, the study presents examples of clean surplus accounting adjustments to residual income and dividends for use in the RIM and DDM valuation models. Business leaders and other stakeholders can use the DDM and RIM valuation models along with methodologies developed in the study to accurately value commercial finance companies. Managers often use capital budgeting techniques to estimate the relative value creation of planned projects. Managers can now employ the study's methodologies of the DDM and RIM valuation models to measure the effectiveness of past and future organizational actions to tabulate the value-added impact of those actions on firm value. For example, managers can now accurately assess the impact of prior staff level changes, marketing campaigns, training programs, research and development, and other actions on current and future value of the firm.

Business leaders and other stakeholders of commercial finance companies need to understand the concept of value creation that corresponds to management decisions. Value-creation activities begin with a value offering that is a mix of performance value, pricing value, relationship-building value, and co-creation value (O'Cass & Ngo, 2011). Business strategies, processes, production, and supply chain are potential value-creation activities (Hsieh, Lee, & Ho, 2012). Valuation models provide a means of measuring value-creating and value-destroying activities (Yu & Zhao, 2015). Leaders and investors of commercial finance companies should focus on the methodologies and findings of this study as a resource for assessing the decisions of management that may create value. Moreover, business leaders may consider changing the culture of commercial finance companies from an asset growth focus to a value-creation focus.

Increased exposure to valuation methodologies by leaders of commercial finance companies should help them to understand how their decisions affect firm value. By understanding how decisions affect value, leaders of commercial finance companies may modify their decision-making approach to a value-creation mindset. In order to disseminate the findings of this study to leaders and other stakeholders of commercial finance companies, I will endeavor to publish articles describing the study's results in industry-related publications. Moreover, the study will be available in the ProQuest UMI Dissertation library for use by academics and other interested parties. Also, I intend to publish a summary article on the study results in the *Business Valuation Review*, a quarterly journal of the American Society of Appraisers.

Recommendations for Further Study

The aim of this quantitative correlational study was to examine the relationship between four valuation model results, the book value of equity, and the market value of equity of participating commercial finance companies. The valuation models used in this study were the DCF model, an RADCF model, the DDM, and the RIM. The combination of the book value of equity and the results of each of the four valuation models was statistically significant in predicting the market value of equity of commercial finance companies. However, the results of DCF and RADCF valuation models were not as accurate as the DDM and RIM model results in predicting the market value of equity of participating companies. Research that focuses on understanding why the DCF and RADCF valuation model results are less accurate than DDM and RIM valuation models in valuing commercial finance companies could serve as a next step. Research of the less precise DCF valuation model should be of particular interest to leaders of commercial finance companies. Leaders are interested in the accuracy of DCF valuation model results because the DCF valuation model is the prevalent model used to value companies (Oded et al., 2011).

In this study, the free cash flows utilized in the valuation models were an outcome of clean surplus accounting adjustments. Heinrichs et al. (2013) undertook research of the relationship between valuation models and clean surplus accounting. However, Heinrichs et al. (2013) did not research the topics of valuation and clean surplus accounting from a commercial finance company perspective. An area meriting further research is the influence clean surplus accounting may have on projected free cash flows of commercial finance companies.

Another topic for further research is the process of estimating future growth rates used in financial projections that drive the formulation of proforma cash flows. This doctoral study included a formulaic growth rate model, where growth rates were a tabulation of the weighted average of seven growth rate variables. Further research of growth rate estimates may result in a refined growth rate model that accurately predicts future expected free cash flows.

Future research on the relationship between specific actions of commercial finance company leaders and any resulting value creation may lead to an understanding of value creating activities. Similarly, further study may identify value-destroying activities that would be of interest to leaders and other stakeholders of commercial finance companies. Moreover, future research may identify value-neutral activities that provide no value-creating or value-destroying results (Yu & Zhao, 2015).

The participating companies in this study were commercial finance companies that met prescribed criteria. Similar future research may use more encompassing selection criteria that result in more than eight participating companies serving as the focus of the research. A larger sample size may increase statistical power, thus enhancing the statistical inference of study results.

Reflections

As the researcher of this study, I found the process of creating valuation model spreadsheets and proforma financial statements a complex undertaking. Initially, I assumed that the process of creating valuation models in Excel would be a straightforward matter of adopting accepted models. I discovered that designs of DCF, DDM, and RIM valuation models differed among academics and valuation practitioners. I found that the valuation model formulation process required a blending of various model derivations from academia and valuation practitioners. In particular, I found that adopting clean surplus accounting to tabulate terminal cash flows led to more accurate valuation model results than the use of dirty surplus accounting. The surplus accounting relationship to valuation model results supported prior study results of Heinrichs et al. (2013),

At the beginning of the research process, I had a preconceived notion that creating proforma financial statements would be a straightforward task of extrapolating historical financial results to produce five-year forward-looking financial statements. The fact that the historical growth rates of the participating companies were not linear led to a deduction that projected asset growth rates should similarly not be linear. Therefore, the composition of growth rates used to create proforma financial statements required an iterative process, where each annual growth rate of assets was independent of the growth rate of any other years. Moreover, I found that macroeconomic growth rate projections obtained from governmental agencies provided more accurate future growth rates than participating company historical growth rates.

When I began the research, I had a preconception that the RADCF valuation model would accurately predict the market value of equity of participating companies. The premise of the preconception was that the inclusion of portfolio risk adjustments to cost of capital would accurately reflect commercial finance company risk factors. I assumed that equity investors of commercial finance companies would factor in loan portfolio risk by adjusting expected returns accordingly. The study findings suggest that investors expected return on investment is a function of earnings, net of provisions for loan losses. Rather than focusing on loan portfolio risk via portfolio composition, investors appear to focus on provisions for loan losses reported in the income statements of commercial finance companies.

I began the study with the presumption that all cost of capital formulations used in valuation models required an unlevering and re-levering of beta coefficients that correlate to the financial leverage of each company undergoing a valuation. Industry betas are usually unlevered to reflect an industry average debt to equity ratio, and then re-levered based on a firm's specific debt to equity ratio (Holthausen & Zmijewski, 2012). During the research process, I discovered that some academics and valuation practitioners prefer the use of unadjusted industry betas for the cost of capital formulations when valuing financial services firms. I elected to use the weighted average of regression estimates of the beta of participating companies as proxies for the unadjusted industry beta of commercial finance companies. The use of unadjusted industry betas resulted in more accurate valuation model results than the use of company-specific levered betas. The use of proxy betas supplanted industry betas of the commercial finance industry, due to an inability to ascertain industry betas.

Summary and Study Conclusions

The purpose of this quantitative correlation study was to determine the linear relationship between four valuation model results and the book value of equity in predicting the market value of equity of participating commercial finance companies. The valuation models used in the study were the discounted cash flow (DCF) model, a portfolio risk-adjusted discounted cash flow model (RADCF), the dividend discount model (DDM), and the residual income model (RIM). Study participants were eight publically traded, autonomous or semiautonomous, commercial finance companies. The study included the formulation of four valuation models used to value the equity of participating companies for each of the five years, 2009 through 2013. The study also included the preparation of proforma financial statements for the participating companies for nine years, 2010 through 2018. Historical financial statement data used in the study were for years 2009 through 2013. During the statistical analysis, one of the eight participating companies emerged as an outlier company, due to non-normal asset growth and negative earnings. As such, the finds of the study did not include valuation model results of the outlier company in the final models.

The study findings concluded that the DCF, RADCF, DDM, and RIM valuation results, combined with the book value of equity, were statistically significant predictors of the market value of equity of the participating companies. However, the mean tabulated value of equity derived by use of the DCF and RADCF valuation models was equal to 58.8% and 22.3%, respectively, of the market value of equity of the participating companies. Whereas, the mean tabulated value of equity derived by use of the DDM and RIM valuation models was equal to 104.7% and 91.1%, respectively, of the market value of equity of the participating companies. Moreover, the Pearson correlation coefficients of the DCF and RADCF valuation model results and market value of equity were .237 and -.026, respectively. The DCF valuation model results had a weak linear correlation with the market value of equity of the participating companies. The RADCF valuation model results indicated a weak negative linear correlation with the market value of the equity of participating companies. Conversely, the linear correlation of the DDM and RIM model results and market value of equity were .993 and .964, respectively. The strong positive linear correlations of the DDM and RIM valuation model results and the book value of equity of the participating companies further confirmed the accuracy of the two valuation models. All four valuation models, when combined with the book value of equity, were statistically significant in predicting the market value of equity of participating commercial finance companies. However, the DDM and RIM valuation model results were more accurate than the DCF and RADCF model results in predicting the market value of equity of participating companies.

The DCF and RADCF valuation models derive value from estimated future free cash flows while DDM and RIM valuation models derive value from estimated future earnings. The study findings imply that leaders of commercial finance companies should focus on earnings rather than free cash flows for value creation. Moreover, the study findings suggest that equity investors of commercial finance companies infer that provisions for loan losses account for the risk associated with loan portfolios. Furthermore, the study findings suggest that equity investors of commercial finance companies expect terminal growth rates of assets that approximate the long-term risk-free bond rates.

The formulation of proforma financial statements as part of this study required the use of growth rate assumptions. Growth rate indicators utilized in this study were industry growth rate estimates provided by two sector trade groups and year over year company historical asset growth rates. Additional growth rate indicators used in the study were economic growth rate estimations obtained from the U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics, and the World Bank. Growth rate estimates obtained from industry trade groups reflect survey responses from trade group members. The survey results may be overly optimistic or pessimistic, reflecting participants' personal perceptions of future events. Therefore, growth rate estimations from trade groups contributed no more that 30% of the total weighted average of the growth rate indicators. The study findings supported the use of multiple growth rate indicators. Leaders and other stakeholders of commercial finance companies may benefit from the use of the multiple indicators examined in the study to derive growth rate assumptions.

The findings of the study provide leaders and other stakeholders of commercial finance companies two methodologies for accurately determining firm value. Companies create value via operating improvements, exploitation of growth opportunities, corporate restructuring, improvements in capital structure efficiency, and other actions that increase return on invested capital, increase growth, and reduce cost of capital (Koller et al., 2010). An ability to measure the relative value creation of management actions or planned actions is vital to creating stakeholder value. Historically, stakeholders of financial services firms were unable to accurately determine firm value (Antill, Hou, & Sarkar, 2014). The methodologies and findings of this study provide stakeholders of commercial finance companies the ability to accurately measure management actions in creating firm value. Moreover, stakeholders of commercial finance companies now have the financial tools necessary to assess value-destroying actions of management, which allow stakeholders to take action to limit such actions. In summary, managers of commercial finance companies now have the ability to validate value-creating activities that increase stakeholder value.

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Appendix A: Growth Rate Indicators and Growth Rate Estimations of CFCP1 (2009-2018)

Growth Assumptions	**2009**	Weights	**2010**	Weights	**2011**	Weights	**2012**	Weights	**2013**	Weights
Growth Rate Indicators:										
ELFA[a] Industry Growth	-33.00%	0.0%	9.20%	0.0%	25.00%	0.0%	14.00%	0.0%	3.00%	0.0%
CFA[b] Industry Growth	-18.50%	20.0%	-0.70%	20.0%	7.20%	20.0%	7.90%	20.0%	6.10%	20.0%
Canadian GDP Growth Rate	-2.70%	20.0%	3.40%	20.0%	2.50%	20.0%	1.70%	20.0%	2.00%	20.0%
BLS CPI	2.70%	10.0%	1.50%	10.0%	3.00%	10.0%	1.70%	10.0%	1.50%	10.0%
Calculated nominal GDP (real x CPI)	-2.67%	10.0%	3.42%	10.0%	2.53%	10.0%	1.72%	10.0%	2.02%	10.0%
World Bank Nominal GDP Growth (CAN)	-2.71%	30.0%	3.37%	30.0%	2.53%	30.0%	1.71%	30.0%	2.02%	30.0%
Company Historical Growth Rate in Portfolio Assets	-10.08%	10.0%	13.80%	10.0%	-12.89%	10.0%	21.71%	10.0%	1.20%	10.0%
		100%		100%		100%		100%		100%
Estimated annual growth rate (Total Assets)	**-6.059%**		**3.424%**		**1.962%**		**4.946%**		**2.698%**	
Est. Growth in terminal period (Total Assets)	**2.733%**		**2.733%**		**2.733%**		**2.733%**		**2.733%**	

Growth Assumptions (Estimations)	**2014**	Weights	**2015**	Weights	**2016**	Weights	**2017**	Weights	**2018**	Weights
Growth Rate Indicators:										
ELFA[a] Industry Growth	8.00%	0.0%	7.00%	0.0%	7.00%	0.0%	6.00%	0.0%	6.00%	0.0%
CFA[b] Industry Growth	6.20%	20.0%	5.20%	20.0%	5.20%	20.0%	4.20%	20.0%	4.20%	20.0%
Canadian GDP Growth Rate	2.60%	20.0%	2.00%	20.0%	2.50%	20.0%	2.00%	20.0%	2.00%	20.0%
BLS CPI	2.20%	10.0%	2.10%	10.0%	2.00%	10.0%	1.75%	10.0%	1.55%	10.0%
Calculated nominal GDP (real x CPI)	2.62%	10.0%	2.02%	10.0%	2.52%	10.0%	2.02%	10.0%	2.02%	10.0%
World Bank Nominal GDP Growth (CAN)	2.00%	30.0%	1.75%	30.0%	1.75%	30.0%	1.25%	30.0%	1.25%	30.0%
Company Historical Growth Rate in Portfolio Assets	4.00%	10.0%	4.00%	10.0%	4.00%	10.0%	4.00%	10.0%	4.00%	10.0%
		100%		100%		100%		100%		100%
Estimated annual growth rate (Total Assets)	**3.242%**		**2.777%**		**2.917%**		**2.392%**		**2.372%**	
Est. Growth in terminal period (Total Assets)	**2.733%**		**2.733%**		**2.733%**		**2.733%**		**2.733%**	

[a] Equipment Leasing and Finance Association
[b] Commercial Finance Association

Appendix B: Proforma Balance Sheet of CFCP1 (2009-2014)

(000s)	2010		2011		2012		2013		2014	
Assets										
Cash	350.9	0.34%	357.8	0.34%	375.5	0.34%	385.6	0.34%	396.2	0.34%
Interest bearing deposits	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Investment securities	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Derivatives (at FMV)	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Assets held for sale	5,167.8	5.04%	5,269.2	5.04%	5,529.8	5.04%	5,679.0	5.04%	5,834.2	5.04%
Loans (net)	92,984.7	90.62%	94,809.4	90.62%	99,498.5	90.62%	102,182.6	90.62%	104,975.6	90.62%
Leases (net)	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Unsecured receivables	294.7	0.29%	300.4	0.29%	315.3	0.29%	323.8	0.29%	332.7	0.29%
Goodwill	1,045.3	1.02%	1,065.8	1.02%	1,118.5	1.02%	1,148.7	1.02%	1,180.1	1.02%
Intangible assets (net)	596.1	0.58%	607.8	0.58%	637.9	0.58%	655.1	0.58%	673.0	0.58%
Other Assets	2,173.8	2.12%	2,216.5	2.12%	2,326.1	2.12%	2,388.8	2.12%	2,454.1	2.12%
Total Assets	102,613.3	100%	104,626.9	100%	109,801.6	100%	112,763.7	100%	115,845.9	100%
Liabilities										
Deposits held	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Derivatives (at FMV)	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Credit balances of factoring clients	4,672.0	8.09%	4,763.6	8.09%	4,999.2	8.09%	5,134.1	8.09%	5,274.4	8.09%
Other liabilities	4,150.2	7.18%	4,231.6	7.18%	4,440.9	7.18%	4,560.7	7.18%	4,685.4	7.18%
Borrowings	48,951.3	84.73%	49,911.9	84.73%	52,380.4	84.73%	53,793.5	84.73%	55,263.9	84.73%
Total Liabilities	57,773.4	100%	58,907.1	100%	61,820.6	100%	63,488.3	100%	65,223.7	100%
Stockholders' Equity										
Common Stock (Par)	7,144.9	15.93%	7,285.1	15.93%	7,645.4	15.93%	7,851.7	15.93%	8,066.3	15.93%
Common stock (PIC)	44.4	0.10%	45.2	0.10%	47.5	0.10%	48.8	0.10%	50.1	0.10%
Retained earnings	45,282.1	100.99%	46,170.7	100.99%	48,454.2	100.99%	49,761.3	100.99%	51,121.5	100.99%
Accumulated other comp. earnings	(7,631.5)	-17.02%	(7,781.3)	-17.02%	(8,166.1)	-17.02%	(8,386.4)	-17.02%	(8,615.7)	-17.02%
Treasury stock	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%	0.0	0.00%
Total Common Stockholders' Equity	44,839.8	100%	45,719.7	100%	47,981.0	100%	49,275.4	100%	50,622.2	100%
Noncontrolling minority interests	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
Total Equity	44,839.8	-	45,719.7	-	47,981.0	-	49,275.4	-	50,622.2	
Total Liabilities and Equity	102,613.3		104,626.9		109,801.6		112,763.7		115,845.9	

Appendix C: CFCP1 Proforma Income Statements (2009-2014)

Revenue (in $ millions)	2010	2011	2012	2013	2014
Interest Income on loans	25,465.7	25,965.4	27,249.6	27,984.8	28,749.7
% of Loans	27.39%	27.39%	27.39%	27.39%	27.39%
Interest and dividends on deposits	*0.0*	*0.0*	*0.0*	0.0	0.0
% of Interest Bearing Deposits	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Interest Income	*25,465.7*	*25,965.4*	*27,249.6*	27,984.8	28,749.7
% Change		*-1.92%*	*-4.71%*	*-2.63%*	*-2.66%*
Interest Expense					
Interest on borrowings	-1,636.62	-1,668.74	-1,751.27	-1,798.52	-1,847.68
% of Borrowings	*3.34%*	*3.34%*	*3.34%*	*3.34%*	*3.34%*
Interest on deposits	0.0	0.0	0.0	0.0	0.0
% of Deposits held	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Total Interest Expense	-1,636.6	-1,668.7	-1,751.3	-1,798.5	-1,847.7
% of Total Interest Income	*-6.43%*	*-6.43%*	*-6.43%*	*-6.43%*	*-6.43%*
Net Interest Revenue	23,829.1	24,296.7	25,498.4	26,186.2	26,902.0
Provision for credit losses	-1,291.1	-1,316.4	-1,381.5	-1,418.8	-1,457.6
% of Loans and Leases (net)	*-1.39%*	*-1.39%*	*-1.39%*	*-1.39%*	*-1.39%*
Net Interest revenue - after credit provision	22,538.0	22,980.3	24,116.8	24,767.4	25,444.4
% of Total Interest Income	*88.50%*	*88.50%*	*88.50%*	*88.50%*	*88.50%*
Non-interest income					
Rental income from operating leases	0.0	0.0	0.0	0.0	0.0
% of Leases (net)	*0.00%*	*0.00%*	*0.00%*	*0.00%*	*0.00%*
Other Income	-708.7	-722.6	-758.3	-778.8	-800.0
% of Total Interest Income	*-2.78%*	*-2.78%*	*-2.78%*	*-2.78%*	*-2.78%*
Total Non-interest income	-708.7	-722.6	-758.3	-778.8	-800.0
Total Revenue, net of interest exp. & provision	21,829.3	22,257.7	23,358.5	23,988.7	24,644.4
Other Expenses					
Depreciation	-119.8	-122.2	-128.2	-131.7	-135.2
% of Interest Income	*-0.47%*	*-0.47%*	*-0.47%*	*-0.47%*	*-0.47%*
Operating expenses	-13,006.3	-13,261.5	-13,917.4	-14,292.9	-14,683.5
% of Total Interest	*-51.07%*	*-51.07%*	*-51.07%*	*-51.07%*	*-51.07%*
Loss on debt extinguishment	0.0	0.0	0.0	0.0	0.0
Total other expenses	-13,126.1	-13,383.7	-14,045.6	-14,424.5	-14,818.8
Income (loss) before income taxes	8,703.2	8,874.0	9,312.9	9,564.2	9,825.6
% of Total Interest and Rental Income	*34.18%*	*34.18%*	*34.18%*	*34.18%*	*34.18%*
Provision for income taxes	-3,046.1	-3,105.9	-3,259.5	-3,347.5	-3,439.0
Income (loss) before noncontrolling interest	5,657.1	5,768.1	6,053.4	6,216.7	6,386.6
Unrealized Gain (Loss) on translation	0.0	0.0	0.0	0.0	0.0
Net income (loss)	5,657.1	5,768.1	6,053.4	6,216.7	6,386.6

Appendix D: Industry Concentrations of CFCP1 (2009-2013)

Industry (SIC)	2009	%	2010	%	2011	%	2012	%	2013	%
Commercial Airlines (3721)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Manufacturing (2000 - 3999)	40,759	16.5%	50,071	19.4%	41,876	21.7%	53,812	27.3%	31,677	18.3%
Student Lending (6141)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Service Industries (7200 - 8744)	16,719	6.8%	16,905	6.6%	22,401	11.6%	26,491	13.4%	43,125	24.9%
Retail (5200 - 5999)	130,890	53.1%	145,060	56.2%	94,443	49.0%	79,413	40.3%	54,300	31.3%
Transportation (4011 - 4400)	5,168	2.1%	12,342	4.8%	5,666	2.9%	2,940	1.5%	0	0.0%
Healthcare (8000 - 8093)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Communications	0	0.0%	0	0.0%	0	0.0	0	0.0%	0	0.0%
Consumer (non-real estate)	0	0.0%	0	0.0	0	0.0	0	0.0	0	0.0
Wholesaling	21,774	8.8%	18,900	7.3%	17,460	0.1	17,303	8.8%	26,884	15.5%
Real Estate (6500)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Energy & Utilities (4900 - 4932)	7,942	3.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Oil & Gas Extraction (1311 - 1389)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Finance & Insurance (6199 & 6399)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Other (7380)	23,453	9.5%	14,625	5.7%	10,784	5.6%	17,181	8.7%	17,471	10.1%
Other noncash assets of firm	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	246,705	100%	257,903	100%	192,630	100%	197,140	100%	173,457	100%

Appendix E: Industry Concentration Weight Adjusted Beta and Cost of Capital (CAPM) for CFCP1

Industry Beta	Levered Betas (1)	Weight (2009)	Levered Betas (1)	Weight (2010)	Levered Betas (1)	Weight (2011)	Levered Betas (1)	Weight (2012)	Levered Betas (1)	Weight (2013)
Commercial Airlines (3721)	0.979	0.000	0.979	0.000	0.979	0.000	0.979	0.000	0.979	0.000
Manufacturing (2000 - 3999)	1.227	0.203	1.227	0.238	1.227	0.267	1.227	0.335	1.227	0.224
Student Lending (6141)	0.666	0.000	0.666	0.000	0.666	0.000	0.666	0.000	0.666	0.000
Service Industries (7200 - 8744)	1.018	0.069	1.018	0.067	1.018	0.118	1.018	0.137	1.018	0.253
Retail (5200 - 5999)	1.183	0.628	1.183	0.666	1.183	0.580	1.183	0.477	1.183	0.370
Transportation (4011 - 4400)	0.952	0.020	0.952	0.046	0.952	0.028	0.952	0.014	0.952	0.000
Healthcare (8000 - 8093)	0.973	0.000	0.973	0.000	0.973	0.000	0.973	0.000	0.973	0.000
Communications	1.149	0.000	1.149	0.000	1.149	0.000	1.149	0.000	1.149	0.000
Consumer (non-real estate)	0.998	0.000	0.998	0.000	0.998	0.000	0.998	0.000	0.998	0.000
Wholesaling	1.183	0.104	1.183	0.087	1.183	0.107	1.183	0.104	1.183	0.183
Real Estate (6500)	1.819	0.000	1.819	0.000	1.819	0.000	1.819	0.000	1.819	0.000
Energy & Utilities (4900 - 4932)	0.839	0.027	0.839	0.000	0.839	0.000	0.839	0.000	0.839	0.000
Oil & Gas Extraction (1311 - 1389)	1.013	0.000	1.013	0.000	1.013	0.000	1.013	0.000	1.013	0.000
Finance & Insurance (6199 & 6399)	0.892	0.000	0.892	0.000	0.892	0.000	0.892	0.000	0.892	0.000
Other (7380)	1.000	0.095	1.000	0.057	1.000	0.056	1.000	0.087	1.000	0.101
Other non-cash assets of firm	1.169	0.000	1.223	0.000	1.289	0.000	1.260	0.000	1.043	0.000
Total Weighted Beta		1.146		1.159		1.156		1.153		1.132
Portfolio Risk Adjusted Ke (CAPM)		9.05%		9.78%		9.61%		9.23%		8.59%
Portfolio Percentage of Total Assets		90.62%		89.82%		89.50%		86.12%		90.03%
Other Assets % of Total Assets		19.38%		20.18%		20.50%		23.88%		19.97%
Weighted-Average Risk Adj. Ke (CAPM)		***9.97%***		***10.82%***		***10.73%***		***10.30%***		***9.36%***

Appendix F: Tabulated FCFF Terminal Value Proforma for CFCP1 (2009)

FCFF Terminal Value Proforma	**2010**	**2011**	**2012**	**2013**	**2014**
Income (loss) before income taxes	8,703.2	8,874.0	9,312.9	9,564.2	9,825.6
(+) Interest expense	1,636.6	1,668.7	1,751.3	1,798.5	1,847.7
(=) Earnings before interest and taxes (EBIT)	10,339.9	10,542.8	11,064.2	11,362.7	11,673.3
EBIT Margin (% of total interest & rental income)	41.8%	41.8%	41.8%	41.8%	41.8%
(-) Taxes on EBIT	(3,619.0)	(3,690.0)	(3,872.5)	(3,976.9)	(4,085.6)
(=) NOPLAT	6,720.9	6,852.8	7,191.7	7,385.7	7,587.6
(+) Income from affiliate(s) - net of taxes	0.0	0.0	0.0	0.0	0.0
(=) Operating Income	6,720.9	6,852.8	7,191.7	7,385.7	7,587.6
(+) Deferred Taxes	0.0	0.0	0.0	0.0	0.0
(+) Decrease (increase) in Operating Assets	(3,104.8)	(1,840.5)	(4,729.8)	(2,707.5)	(2,817.2)
FCFF	3,616.1	5,012.3	2,462.0	4,678.3	4,770.4
Derived Dividend	2,106.9	2,148.3	2,254.5	2,315.4	2,378.7
Derived Borrowings	43,097.2	41,902.0	43,445.8	42,881.4	42,337.4
Book Operating Assets	93,791.1	95,631.6	100,361.4	103,068.9	105,886.1
Derived Book Equity	52,368.5	55,988.3	59,787.1	63,688.5	67,696.4
Derived Cash Flow	3,616.1	5,012.3	2,462.0	4,678.3	4,770.4

Appendix G: Clean Surplus Accounting Adjustments to Residual Income and Dividends for CFCP1 (2009-2013)

Clean Surplus Accounting Book Equity	*Book Equity$_t$ = Book Equity$_{t-1}$ + Net Income$_t$ - Dividends$_t$*				
	2009 Valuation	**2010 Valuation**	**2011 Valuation**	**2012 Valuation**	**2013 Valuation**
Proforma Year					
2009	43,355.5				
2010	46,905.7	44,575.0			
2011	50,525.5	48,944.8	47,855.1		
2012	54,324.3	53,530.8	52,037.5	47,395.5	
2013	58,225.7	58,240.4	56,332.8	51,080.2	53,430.5
2014	62,233.6	63,074.4	60,767.3	54,884.4	57,306.9
2015		68,040.6	65,325.0	58,794.3	61,291.0
2016			70,007.3	62,818.1	65,439.5
2017				66,952.0	69,687.1
2018					74,050.9
Net Income$_6$ = Net Income$_5$ x (1+g)	6,561.2	8,129.7	7,665.0	6,767.3	7,143.7
Book Equity$_6$ = Book Equity$_5$ x (1+g)	63,934.7	69,900.3	71,920.8	68,782.0	76,075.0
Dividend$_6$ = Net Income$_6$ - (BE$_6$ - BE$_5$)	4,860.1	6,270.0	5,751.5	4,937.3	5,119.6
Residual Income$_7$ = Net Income$_6$ - (K$_e$ x BE$_6$)	1,352.7	2,435.3	1,806.0	1,163.9	946.2
Number of shares outstanding (000's)	9,420.4	9,387.7	8,718.9	8,221.5	8,221.5
Dividend$_6$ per share	0.52	0.67	0.66	0.60	0.62

[6] Terminal Period
[5] Year Prior to Terminal Period

Appendix H: RADCF Valuation Results for CFCP1 (2009)

	Proforma 2010	**Proforma 2011**	**Proforma 2012**	**Proforma 2013**	**Proforma 2014**	**Terminal Period**
Free Cash Flow to the Firm	5,581.1	6,308.9	5,297.4	6,444.4	6,598.3	4,900.8
Present Value of FCFF	5,075.0	5,216.5	3,982.9	4,405.8	4,102.0	67,689.9
Terminal Value (PV)						
Sum of PV of FFCFs years 1-5	22,782.3					
(+) PV of Terminal value	42,080.9					
(=) Enterprise Value	64,863.2					
(-) Market Value of Debt	(46,522.3)					
(+) Non-Operating Cash & Equiv.	0.0					
(+) Other Assets	8,970.6					
(-) Minority interest	0.0					
(-) Preferred stock	0.0					
(=) Equity value (000's)	**27,311.5**	**Value of the firm**	**73,833.8**			
Equity value per share	2.9					
Actual Price Per Share	4.6					
Market Capitalization (000's)	43,280.9		Valuation % of Market Capitalization	63.1%		

Appendix I: DCF Valuation Results for CFCP1 (2009)

(2009 Valuation)	**Proforma 2010**	**Proforma 2011**	**Proforma 2012**	**Proforma 2013**	**Proforma 2014**	**Terminal Period**
Free Cash Flow to the Firm	5,581.1	6,308.9	5,297.4	6,444.4	6,598.3	4,900.8
Present Value of FCFF	5,113.3	5,295.6	4,073.8	4,540.4	4,259.1	90,534.1
Terminal Value (PV)						
Sum of PV of FFCFs years 1-5	23,282.2					
(+) PV of Terminal value	61,199.7					
(=) Enterprise Value	84,481.9					
(-) Market Value of Debt	(46,522.3)					
(+) Non-Operating Cash & Equiv.	0.0					
(+) Other Assets	8,394.2					
(-) Minority interest	0.0					
(-) Preferred stock	0.0					
(=) Equity value (000's)	**46,353.8**	**Value of the firm**	**92,876.0**			
Equity value per share	4.9					
Actual Price Per Share	4.6					
Market Capitalization (000's)	43,280.9	Equity Valuation % of Market Capitalization		107.1%		

Appendix J: DDM Valuation Results for CFCP1 (2009)

Dividend Discount Model	DDM	$V_0 = D_0(1 + g_S)^t/(1 + K_e)^t + (D_0(1 + g_S))/((K_e - g_L)x(1 + K_e)^n)$			
Dividend per share	2009 Valuation	2010 Valuation	2011 Valuation	2012 Valuation	2013 Valuation
2010	0.22				
2011	0.23	0.28			
2012	0.24	0.29	0.28		
2013	0.25	0.30	0.29	0.27	
2014	0.25	0.31	0.30	0.27	0.28
2015		0.31	0.31	0.28	0.29
2016			0.32	0.29	0.30
2017				0.30	0.31
2018					0.32
Present Values of dividends:					
Short-term abnormal growth period (2009)					
Short-term abnormal growth period (2010)	0.20				
Short-term abnormal growth period (2011)	0.19	0.25			
Short-term abnormal growth period (2012)	0.18	0.24	0.26		
Short-term abnormal growth period (2013)	0.17	0.22	0.24	0.24	
Short-term abnormal growth period (2014)	0.16	0.21	0.22	0.23	0.26
Short-term abnormal growth period (2015)		0.19	0.21	0.21	0.25
Short-term abnormal growth period (2016)			0.19	0.20	0.24
Short-term abnormal growth period (2017)				0.19	0.22
Short-term abnormal growth period (2018)					0.21
Terminal value - steady-state growth	6.15	7.62	7.43	6.94	7.78
Value per share (dollars)	7.07	8.74	8.55	8.00	8.95
Number of shares outstanding (000's)	9,420.4	9,387.7	8,718.9	8,221.5	8,221.5
DDM value of firm's common equity (000's)	**66,588.3**	**82,027.0**	**74,582.5**	**65,805.5**	**73,621.1**
Actual Price Per Share	4.60	6.65	6.26	7.53	9.36
Market Capitalization (000's)	**43,280.9**	**60,286.2**	**54,580.3**	**61,907.9**	**76,953.2**
Valuation % of Market Capitalization	153.9%	136.1%	136.6%	106.3%	95.7%
DDM value of firm's common equity (000's)	66,588.3	82,027.0	74,582.5	65,805.5	73,621.1
(+) Market Value of Borrowing (debt)	46,522.3	55,081.4	42,062.4	70,284.6	58,919.4
(+) Non-Operating Cash & Equiv.	0.0	0.0	0.0	3,441.4	0.0
(+) Other Assets	8,394.2	7,059.3	7,604.3	7,587.2	8,710.4
(-) Minority interest	0.0	0.0	0.0	0.0	0.0
(-) Preferred stock	0.0	0.0	0.0	0.0	0.0
(=) Value of the firm	***121,504.7***	***144,167.7***	***124,249.2***	***147,118.7***	***141,250.9***

Appendix K: RIM Valuation Results for CFCP1 (2009)

Residual Income Model	$V_0 = BV_0 + \sum RI_t/(1 + r)^t + T_n/(1 + r)^{n-t}$				
	2009 Valuation	2010 Valuation	2011 Valuation	2012 Valuation	2013 Valuation
2010	1,690.3				
2011	1,476.5	2,456.6			
2012	1,430.6	2,359.2	1,685.5		
2013	1,246.3	2,092.7	(5,414.3)	1,202.9	
2014	1,059.3	1,814.7	983.2	1,030.3	1,824.3
2015		1,536.5	743.7	823.9	1,680.0
2016			465.8	620.5	1,617.4
2017				399.4	1,437.5
2018					1,276.5
Book Value of Equity Capital	43,355.5	44,575.0	47,855.1	47,395.5	53,430.5
Present Values of residual income:					
Short-term abnormal growth period (2009)					
Short-term abnormal growth period (2010)	1,548.6				
Short-term abnormal growth period (2011)	1,239.3	2,231.1			
Short-term abnormal growth period (2012)	1,100.1	1,945.9	1,526.7		
Short-term abnormal growth period (2013)	878.1	1,567.6	(4,441.9)	1,095.0	
Short-term abnormal growth period (2014)	683.7	1,234.5	730.6	853.8	1,686.9
Short-term abnormal growth period (2015)		949.3	500.6	621.5	1,436.4
Short-term abnormal growth period (2016)			283.9	426.1	1,278.7
Short-term abnormal growth period (2017)				249.7	1,050.9
Short-term abnormal growth period (2018)					862.9
Terminal Value of Future Residual Income	16,130.5	27,794.5	20,338.8	13,442.2	11,815.7
Sum of PV RIM cash flows	**21,580.4**	**35,722.8**	**18,938.7**	**16,688.2**	**18,131.5**
(+) Book Value	43,355.5	44,575.0	47,855.1	47,395.5	53,430.5
RIM Valuation of Equity	**64,935.9**	**80,297.8**	**66,793.7**	**64,083.7**	**71,562.0**
Number of shares outstanding (000's)	9,420	9,388	8,719	8,222	8,222
RIM Value Per Share	6.89	8.55	7.66	7.79	8.70
Actual Market Price Per Share	4.60	6.65	6.26	7.53	9.36
Market Capitalization (000's)	**43,280.9**	**60,286.2**	**54,580.3**	**61,907.9**	**76,953.2**
Valuation % of Market Capitalization	150.0%	133.2%	122.4%	103.5%	93.0%
RIM Valuation of Equity	64,935.9	80,297.8	66,793.7	64,083.7	71,562.0
(+) Market Value of Borrowing (debt)	46,522.3	55,081.4	42,062.4	70,284.6	58,919.4
(+) Non-Operating Cash & Equiv.	0.0	0.0	0.0	3,441.4	0.0
(+) Other Assets	8,394.2	7,059.3	7,604.3	7,587.2	8,710.4
(-) Minority interest	0.0	0.0	0.0	0.0	0.0
(-) Preferred stock	0.0	0.0	0.0	0.0	0.0
(=) Value of the firm	***119,852.3***	***142,438.5***	***116,460.5***	***145,396.9***	***139,191.8***