234726

SLOVER & LOFTUS LLP
ATTORNEYS AT LAW
1224 SEVENTEENTH STREET, N.W.
WASHINGTON, D.C. 20036-3003

WILLIAM L. SLOVER
C. MICHAEL LOFTUS
JOHN H. LE SEUR
KELVIN J. DOWD
ROBERT D. ROSENBERG
CHRISTOPHER A. MILLS
FRANK J. PERGOLIZZI
ANDREW B. KOLESAR III
PETER A. PFOHL
DANIEL M. JAFFE
STEPHANIE A. ARCHULETA

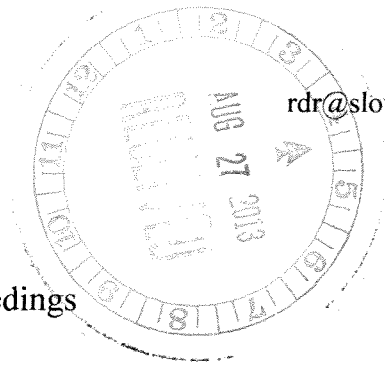
OF COUNSEL
DONALD G. AVERY

TELEPHONE:
(202) 347-7170

FAX:
(202) 347-3619

WRITER'S E-MAIL:
rdr@sloverandloftus.com

March 4, 2103



BY HAND

The Honorable Cynthia T. Brown
Chief, Section of Administration, Office of Proceedings
Surface Transportation Board
395 E Street, S.W.
Washington, D.C. 20423-0001

Re: STB EP 664 (Sub-No. 2), Petition of the Western Coal Traffic League to Institute a Rulemaking Proceeding to Abolish Use of the Multi-stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital

Dear Ms. Brown:

Enclosed for filing in STB EP 664 (Sub-No. 2) are the original and ten copies of the Petition of the Western Coal Traffic League to Institute a Rulemaking Proceeding to Abolish Use of the Multi-stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital, including Verified Statements from Daniel L. Fapp and Professor James E. Hodder. Also enclosed are three CDs containing electronic versions of the documents as well as Professor Hodder's electronic workpapers.

Please date stamp the extra copies of this cover letter and the enclosed filing and return them to our messenger. Also, please let us know if there are any questions.

Respectfully submitted,

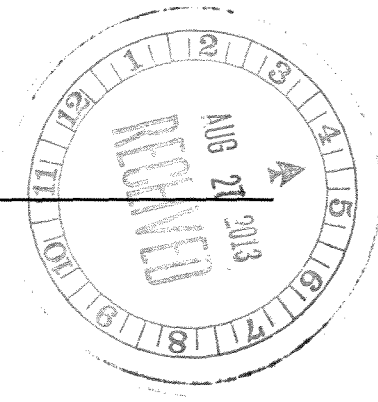
Robert D. Rosenberg

Robert D. Rosenberg
An Attorney for the Western Coal Traffic League

ENTERED
Office of Proceedings
AUG 27 2013
Part of
Public Record

Enclosures

BEFORE THE
SURFACE TRANSPORTATION BOARD



PETITION OF THE WESTERN COAL TRAFFIC LEAGUE TO INSTITUTE A RULEMAKING PROCEEDING TO ABOLISH THE USE OF THE MULTI-STAGE DISCOUNTED CASH FLOW MODEL IN DETERMINING THE RAILROAD INDUSTRY'S COST OF EQUITY CAPITAL	)	EP 664 (Sub-No. 2)

234726

PETITION OF THE WESTERN COAL TRAFFIC LEAGUE TO INSTITUTE A RULEMAKING PROCEEDING TO ABOLISH THE USE OF THE MULTI-STAGE DISCOUNTED CASH FLOW MODEL IN DETERMINING THE RAILROAD INDUSTRY'S COST OF EQUITY CAPITAL

WESTERN COAL TRAFFIC LEAGUE

William L. Slover
Robert D. Rosenberg
Slover & Loftus LLP
1224 Seventeenth Street, N.W.
Washington, D.C. 20036
(202) 347-7170

Its Attorneys

Of Counsel:

Slover & Loftus LLP
1224 Seventeenth Street, N.W.
Washington, D.C. 20036
(202) 347-7170

Dated: August 27, 2013

ENTERED
Office of Proceedings
AUG 27 2013
Part of
Public Record

TABLE OF CONTENTS

BEFORE THE
SURFACE TRANSPORTATION BOARD

PETITION OF THE WESTERN COAL TRAFFIC LEAGUE TO INSTITUTE A RULEMAKING PROCEEDING TO ABOLISH THE USE OF THE MULTI-STAGE DISCOUNTED CASH FLOW MODEL IN DETERMINING THE RAILROAD INDUSTRY'S COST OF EQUITY CAPITAL	)	EP 664 (Sub-No. 2)

PETITION OF THE WESTERN COAL TRAFFIC LEAGUE TO INSTITUTE A RULEMAKING PROCEEDING TO ABOLISH THE USE OF THE MULTI-STAGE DISCOUNTED CASH FLOW MODEL IN DETERMINING THE RAILROAD INDUSTRY'S COST OF EQUITY CAPITAL

Pursuant to 49 C.F.R. § 1110.2(b), the Western Coal Traffic League ("WCTL")[1] hereby petitions the Surface Transportation Board ("STB" or "Board") to institute a rulemaking proceeding to abolish the use of its Multi-Stage Discounted Cash Flow ("MSDCF") model in its determination of the railroad cost of equity ("COE") and cost of capital ("COC") and to instead rely exclusively on the Capital Asset Pricing Model ("CAPM").

[1] WCTL is a voluntary association, whose regular membership consists entirely of shippers of coal mined west of the Mississippi River that is transported by rail. WCTL members currently ship and receive in excess of 175 million tons of coal by rail each year. WCTL's members are: Ameren Energy Fuels and Services, Arizona Electric Power Cooperative, Inc., CLECO Corporation, Austin Energy (City of Austin, Texas), CPS Energy, Entergy Services, Inc., Kansas City Power & Light Company, Lower Colorado River Authority, MidAmerican Energy Company, Minnesota Power, Nebraska Public Power District, Omaha Public Power District, Texas Municipal Power Agency, Western Fuels Association, Inc., and Wisconsin Public Service Corporation.

I.

INTRODUCTION AND SUMMARY

The COC is a critical input for calculating variable costs, the associated jurisdictional threshold, and stand-alone costs. An overstated COC directly exposes captive shippers, including some WCTL members, to unreasonably high rail rates. For the most part, those who pay the railroads for coal transportation are the nation's electricity consumers. The COC also colors the general perception of railroad costs and the Board's view of the railroads' revenue adequacy. An accurate COC is of deep concern to WCTL and its members as well as shippers generally.

The Board substantially improved its COC methodology in 2008 by replacing its defective single-stage discounted cash flow ("SSDCF") model with the CAPM starting with the 2006 COE determination. *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, EP 664 (STB served Jan. 17, 2008) ("*CAPM*"). Regrettably, the Board took a major step backwards, just a year later, by adopting the hybrid CAPM-MSDCF average starting with the 2008 COE. *Use of a Multi-Stage Discounted Cash Flow Model in Determining the Railroad Industry's Cost of Capital*, EP 664 (Sub-No. 1) (STB served Jan. 28, 2009) ("*MSDCF Case*"). Adding the use of the MSDCF model has not improved the accuracy or reliability of the Board's COC. It has instead wrongfully increased the railroads' COC and COE significantly, *e.g.*, the increase in the 2012 COE caused by use of the MSDCF exceeds **300** basis points. Increases of this magnitude were not contemplated when the Board adopted the

average of the MSDCF and CAPM models for the determination of railroad equity capital costs.

As demonstrated in the attached verified statements of Daniel L. Fapp of L.E. Peabody & Associates, Inc. ("Fapp VS") (Exhibit A) and Professor James E. Hodder ("Hodder VS") (Exhibit B), the COE values as indicated by the MSDCF model are consistently erroneous because of internal flaws of the model when it is applied to the railroad industry. Instead, the Board must rely solely on the CAPM values.

When WCTL presented these same points elsewhere, the Board responded that they should be raised in a petition to institute a rulemaking. The instant filing complies with the Board's directive.

II.

BACKGROUND

For many years (1981-2005), the agency determined the COE using the SSDCF model. The SSDCF derives the COE as the sum of the dividend yield and a projected EPS growth rate that is assumed to apply in perpetuity. In *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital,* EP 664, WCTL demonstrated that the SSDCF was flawed as applied to railroads and persuaded the Board to instead use the CAPM model, which was shown by the evidence to more accurately measure the cost of railroad equity capital than the SSDCF model which had consistently overstated the actual cost of railroad equity capital. *CAPM* at 3-4, 6-7.

Subsequently, the AAR proposed, and the Board adopted in the *MSDCF Case*, over WCTL's vigorous objections, the use of a MSDCF model intended to track

the Morningstar/Ibbotson three-stage DCF methodology. The Board believed, at the time, that by using a simple CAPM/MSDCF average to measure rail equity costs a more precise and stable COE would result than by relying on only the CAPM model. *Id.* at 1-2, 15.

The MSDCF implementation mandated by the Board focuses on firm-wide cashflows ("CF") rather than the dividend yield employed in the discredited SSDCF approach. Cash flows during the model's first two five-year stages are calculated from an initial CF estimate reflecting "income before extraordinary items (IBEI) minus capital expenditures (CAPEX), plus depreciation (DEP) and deferred taxes (DT)," based on the total sales for the previous year multiplied by the average cashflow/sales ratio for the past five years. Third-stage CF reflects only IBEI. First-stage growth rates reflect "the firm's annual earnings growth rate" defined as "the median value of the qualifying railroad's 3- to 5-year growth estimates as determined by railroad industry analysts and published by Institutional Brokers Estimate System (IBES)." The second stage uses "the average of all growth rates in stage 1." The third stage uses "the long-run nominal growth rate of the average U.S. economy." *Id.* at 5-6.

The first two stages of the MSDCF use much the same procedure for forecasting EPS growth rates as the flawed SSDCF, but apply the EPS growth rates to firm-wide cash flows rather than individual share dividends. The COE is the discount rate that causes the estimated firm cash flows to match the market value of its shares.

III.

USE OF THE MSDCF MODEL HAS INCREASED THE COE VALUES SUBSTANTIALLY

Averaging CAPM values with MSDCF values has increased the COE substantially over the 2008-2012 period. The following table compares the CAPM and MSDCF values for 2008-2012, the period during which the Board has utilized the average of the MSDCF and CAPM models:

Table 1
Comparison of CAPM and MSDCF COE Values for 2008-2012

Year	CAPM COE	MSDCF COE	Difference
2008	10.39%	15.95%	5.56%
2009	11.39%	13.34%	1.95%
2010	11.84%	14.13%	2.29%
2011	11.31%	15.83%	4.52%
2012	10.27%	16.53%	6.26%
Average	11.04%	15.16%	4.12%

Source: Hodder VS at 3.

The use of the MSDCF raised the 2008-2012 average COE by over 200 basis points and the average COC by over 156 basis percentage points, equating to an increase in the overall COC of 16%.[2]

The Board adopted the CAPM/MSDCF average to help stabilize the COE values. *MSDCF Case* at 3, 4, 8. The MSDCF's contribution to stability has been minor. The CAPM COE values for 2008-2012 have varied from a low of 10.39% (2008) to a

[2] The MSDCF comprises 50% of the COE, the average CAPM has exceeded the average MSDCF by 412 basis points, and 50%x412=206. During 2008-2012, equity averaged 76.51% of the capital structure, and 76.51% of 206 basis points equals 157.6 basis points. The COC for 2008-2012 averaged 11.18%, but would have been below 9.61% without the MSDCF (11.18%-1.57%=9.61%), and 11.18%÷9.61%=1.16. The impact on the before-tax COC and COE, utilized under URCS, is greater.

high of 11.84% (2010), a range of 157 basis points. The CAPM/MSDCF average COE has varied from a low of 12.37% (2009) to a high of 13.57% (2011), a range of 120 basis points. A 120-point range is lower than a 157-point range, but a difference of only 37 basis points is minor, especially compared to the large COE and COC increases caused by including the MSDCF.[3] Furthermore, stability by itself does not establish increased accuracy or reliability, especially in light of the substantial flux in underlying economic conditions since 2008. In any event, the MSDCF's contribution to stability pales in comparison to the way in which it has increased overall COE/COC values.

IV.

THE MSDCF COE VALUES ARE UNREALISTICALLY HIGH

The key question is not whether the MSDCF has contributed to a more stable COE, but whether the MSDCF has contributed to a more accurate COE. Setting the COE in a regulatory context consists in large part of measuring the reasonable expectations of investors. Indeed, a DCF model purports to infer the COE "on the basis of the return expectations embodied in the prices investors are willing to pay for stocks." *Methodology to be Employed in Determining the Railroad Industry's Cost of Capital*, EP 664 (STB served Sept. 20, 2006), at 2. Furthermore, the issue is not merely whether a particular method is sound in theory, but whether the results are accurate or at least credible. *E.g.*, *FPC v. Hope Natural Gas Co.*, 320 U.S. 591, 602 (1944). In particular, a

[3] The MSDCF COE values have been far more variable, but they have still contributed modestly to a more stable average, as the CAPM and MSDCF changes have tended to offset each other. Whether and how long this pattern will continues is an open question.

Board-derived COE that exceeds those derived from mainstream analyses will likely provide the railroads and their investors with a return exceeding that required to attract or retain capital, yield excessive rail rates, and misallocate resources.

To test the reasonableness of the Board's COE figures, Mr. Fapp reviewed numerous analyses of CSX, NS, and UP prepared by brokerage and financial reporting firms. Two such firms, Standard & Poor's and Marketgrader, provide explicit COE values as part of their reports. The COE values of these respected firms are far lower than both the MSDCF and MSDCF/CAPM average COE values developed by the STB, and are even generally below the level of the Board's CAPM COE values. Fapp VS at 1-3. Mr. Fapp found no stock analysis report that supported the reasonableness of the Board's MSDCF or MSDCF/CAPM COE figures. (A third firm, Morningstar, does not disclose COC or COE values, but states that the three railroads are outearning their COC on a long-term basis.) The Fapp data shows that the MSDCF values are unrealistically high and that their inclusion undermines the accuracy of the Board's COE values.

V.

THE BOARD'S MSDCF IS SUBSTANTIVELY FLAWED

WCTL asked Professor Hodder, an authority on finance and capital, to review the Board's MSDCF methodology and to examine the disparity between the MSDCF and CAPM COEs. Professor Hodder explains that the deviations are too large to be dismissed and attributes them to several flaws in the Board's application of the Morningstar/Ibbotson "one-size-fits-all" MSDCF methodology to the railroad data. Hodder VS at 3-4.

First, the second stage of the model fails to implement a smooth transition from the first stage to the third stage because only three railroads are included and all have high projected growth rates.[4] Instead of a smooth transition, the third-stage produces an abrupt reduction as its growth rates are approximately one-third of those of the first two stages. The absence of a reasonable transition in the second stage creates a substantial upwards bias in the COE. Hodder VS at 4-5.

Second, the third stage of the model also fails to achieve a smooth reduction in cashflows. Instead, there is actually a sharp surge in cashflows -- exceeding 40% for CSX and NS in 2012 -- at the start of the third stage. The increase again has an upward bias. Such large increases over a very short time frame (literally overnight) ten years and a day after the start of the model are inherently implausible and indicate a modeling flaw. Hodder VS at 5-6.

Third, the MSDCF bases growth in firm-wide cashflow on EPS. However, the railroads have conducted stock buybacks that have significantly reduced their net number of shares outstanding during 2008-2012. The share reductions cause EPS to increase faster than firm-wide earnings. Using EPS to project firm cashflows under such conditions will overstate growth in firm-wide earnings, and the mismatch again produces an overstated COE. Hodder VS at 6-9.

[4] Where the second stage growth rate reflects a broader industry segment with more firms and more types of firms, the high growth rates of some members may be balanced by lower growth rates of others, and the second stage may effectuate a reasonable transition.

Professor Hodder concludes that the problems noted are not inherent to multi-stage discounted cash flow models generally, but arise from the particular assumptions made in the Morningstar/Ibbotson MSDCF model and the Board's application of the model to the railroad industry. Significantly, all have been present since the Board began using the MSDCF in 2008. Dr. Hodder concludes that MSDCF COE estimates "are not reliable and are biased upward" and have "substantial" problems, whereas "the CAPM estimates during that period are apt to be far more accurate and credible." Hodder VS at 11.

VI.

CONCLUSION

As demonstrated above, the Board's MSDCF methodology is flawed; produces an overstated COE/COC for the railroads; and its utilization should cease.

Respectfully submitted,

WESTERN COAL TRAFFIC LEAGUE

William L. Slover
Robert D. Rosenberg
Slover & Loftus LLP
1224 Seventeenth Street, N.W.
Washington, D.C. 20036
(202) 347-7170

Its Attorneys

Of Counsel:

Slover & Loftus LLP
1224 Seventeenth Street, N.W.
Washington, D.C. 20036
(202) 347-7170

Dated: August 27, 2013

EXHIBIT A

VERIFIED STATEMENT OF DANIEL L. FAPP

VERIFIED STATEMENT OF DANIEL L. FAPP

I am Daniel L. Fapp, an economist and a Vice President of L. E. Peabody & Associates, Inc., an economic consulting firm. A copy of my credentials is included as Exhibit No. 1 to this verified statement. My consulting assignments regularly involve railroad financial issues, including cost of capital determinations. In these assignments, I have calculated railroad capital structures, market values, cost of railroad debt, cost of preferred railroad equity and cost of common railroad equity. I am also well acquainted with and have used the commonly accepted models for determining a firm's cost of equity, including Single-Stage Discounted Cash Flow Models, Multi-Stage Discounted Cash Flow Models ("MS-DCF"), and the Capital Asset Pricing Model ("CAPM"). I have developed railroad industry average cost of capital and company specific cost of capital for use in litigation and for use in general business management.

I have been requested by Counsel for the Western Coal Traffic League ("WCTL") to review the railroad cost of equity developed by independent investment firms and financial reporting firms and to present the costs of equity produced by these independent companies.

In performing my assignment, I have reviewed the railroad research reports produced by several equity research firms, and I have reviewed valuation reports from investment banking firms to determine which of these firms listed their cost of equity ("COE") assumptions for the railroads included in the STB's annual cost of capital determination. My review included research and valuation reports from nine (9) large brokerage and investment banking firms,[1] six (6) financial reporting firms,[2] and ten (10) smaller research firms.[3] My review found two different research firms, S&P and MarketGrader, that included their railroad cost of equity

---

[1] Deutsche Bank, Smith Barney, Goldman Sachs, Merrill Lynch, J. P Morgan, Credit Suisse, Edward Jones, UBS and Wells Fargo.

[2] Standard & Poor's ("S&P"), Reuters, Morningstar Equity Analysis Reports, Thompson's, Compustat and First Call.

[3] New Constructs, MarketGrader, EVA Dimensions, Market Edge Research, Columbine Capital Services, Ativo Research, Ford Equity Research, Jefferson Research, Ned Davis Research and Zack's Investment Research.

estimates in their railroad company research reports.[4] In every case where the railroad cost of equity was reported, the cost of equity estimate used by the research firm was lower than the MS-DCF and CAPM costs of equity determined and used by the STB.

S&P included its railroad company cost of equity estimates in its stock reports for the three current companies included in the STB's cost of capital determination. Table 1 below compares the S&P costs of equity to the STB's MS-DCF cost of equity estimates.

Table 1
STB Multi-Stage Discounted Cash Flow
Cost of Equity and Standard & Poor's Railroad Cost of Equity

	CSX		NSC		UNP	
Year	STB MS-DCF	S&P COE[1/]	STB MS-DCF	S&P COE[1/]	STB MS-DCF	S&P COE[1/]
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. 2008	17.0%	1/	16.5%	1/	15.5%	1/
2. 2009	13.6%	10.9%	14.8%	11.2%	13.0%	10.5%
3. 2010	14.0%	10.9%	15.1%	10.8%	13.8%	10.5%
4. 2011	16.7%	10.9%	16.8%	10.8%	15.0%	10.5%
5. 2012	18.3%	10.9%	17.7%	10.8%	15.5%	10.5%

Source: Exhibit No. 2
1/ Not reported in S&P reports.

MarketGrader, an independent equity research firm, also estimated the railroad companies' cost of equity. Table 2 below provides MarketGrader's current estimates of the railroads' cost of equity.

[4] While in some cases the research and valuation reports I reviewed included the railroad company's estimated cost of capital (these firms included Credit Suisse, Goldman Sachs, EVA Dimensions, MarketGrader, S&P, New Construction and Ativo Research), in most instances the reports were silent on their cost of capital and cost of equity assumptions. Firms that do not public disclose their cost of equity estimates for railroads may still develop or use estimates in their financial analysis.

Table 2
MarketGrader Railroad Costs of Equity - July 2013

Item	CSX	NSC	UNP
(1)	(2)	(3)	(4)
1. MarketGrader Unweighted Cost of Equity	9.80%	10.34%	9.27%
2. STB 2012 MS-DCF Cost of Equity	18.32%	17.65%	15.53%
3. % STB exceeds MarketGrader [1/]	87%	71%	68%

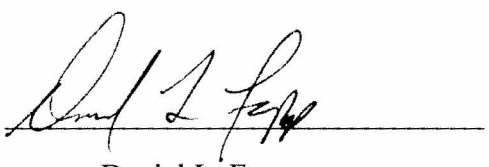
Source: Exhibit No. 3
1/ (Line 2 ÷ Line 1) – 1.0.

Equity research and investment banking firms can be presumed to be using accurate information in their analyses. Based on the examples above, it appears that the equity research and investment banking firms believe that the railroad companies' costs of equity range between roughly 9.2 and 11.2 percent, depending upon the railroad and the time period. The STB's CAPM cost of equity estimates are generally in-line with these independent cost of equity estimates, although the Board's CAPM figures tend to be a slightly higher when compared on an annual basis.[5] However, the cost of equity figures produced by the independent firms are substantially lower than the STB's MS-DCF determinations. I believe the STB's MS-DCF costs of equity to be significantly overstated.

[5] Between 2008 and 2012, the STB's CAPM costs equity ranged from 10.4 to 11.8 percent

VERIFICATION

I, Daniel L. Fapp, declare under penalty of perjury, that the foregoing Statement is true and correct, and that I am qualified and authorized to file this Statement.



Daniel L. Fapp

Executed on
August 26, 2013

STATEMENT OF QUALIFICATIONS

My name is Daniel L. Fapp. I am Vice President of the economic consulting firm of L. E. Peabody & Associates, Inc. The firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, VA 22314; 760 E. Pusch View Lane, Suite 150, Tucson, Arizona 85737; and 21 Founders Way, Queensbury, New York 85737.

I received a Bachelor of Science degree in Business Administration with an option in Marketing (cum laude) from the California State University, Northridge in 1987, and a Master of Business Administration degree from the University of Arizona's Eller College of Management in 1993, specializing in finance and operations management. I am also a member of Beta Gamma Sigma, the national honor society for collegiate schools of business.

I have been employed by L. E. Peabody & Associates, Inc. since December 1997. Prior to joining L. E. Peabody & Associates, Inc., I was employed by BHP Copper Inc. in the role of Transportation Manager - Finance and Administration, and where I also served as an officer and treasurer of the three BHP Copper Inc. subsidiary railroads, The San Manual Arizona Railroad, the Magma Arizona Railroad (also known as the BHP Arizona Railroad) and the BHP Nevada Railroad. I have also held operations management positions with Arizona Lithographers in Tucson, AZ and MCA-Universal Studios in Universal City, CA.

While at BHP Copper Inc., I was responsible for all financial and administrative functions of the company's transportation group. I also directed the BHP Copper Inc. subsidiary railroads' cost and revenue accounting staff, and managed the San Manuel Arizona Railroad's and BHP Arizona Railroad's dispatchers and the railroad dispatching functions. I served on the company's Commercial and Transportation Management Team and the company's Railroad Acquisition Team where I was responsible for evaluating the acquisition of new railroads,

STATEMENT OF QUALIFICATIONS

including developing financial and economic assessment models. While with MCA-Universal Studios, I held several operations management positions, including Tour Operations Manager, where my duties included vehicle routing and scheduling, personnel scheduling, forecasting facilities utilization, and designing and performing queuing analyses.

As part of my work for L. E. Peabody & Associates, Inc., I have performed and directed numerous projects and analyses undertaken on behalf of utility companies, short line railroads, bulk shippers, and industry and trade associations. Examples of studies which I have participated in organizing and directing include, traffic, operational and cost analyses in connection with the rail movement of coal, metallic ores, pulp and paper products, and other commodities. I have also analyzed multiple car movements, unit train operations, divisions of through rail rates and switching operations throughout the United States. The nature of these studies enabled me to become familiar with the operating procedures utilized by railroads in the normal course of business.

Since 1997, I have participated in the development of cost of service analyses for the movement of coal over the major eastern and western coal-hauling railroads. I have conducted on-site studies of switching, detention and line-haul activities relating to the handling of coal. I have also participated in and managed several projects assisting short-line railroads. In these engagements, I assisted short-line railroads in their negotiations with connecting Class I carriers, performed railroad property and business evaluations, and worked on rail line abandonment projects.

I have been frequently called upon to perform financial analyses and assessments of Class I, Class II and Class III railroad companies. I have determined the Going Concern Value of privately held freight and passenger railroads, including developing company specific costs of

STATEMENT OF QUALIFICATIONS

debt and equity for use in discounting future company cash flows. My consulting assignments regularly involve working with and determining various facets of railroad financial issues, including cost of capital determinations. In these assignments, I have calculated railroad capital structures, market values, cost of railroad debt, cost of preferred railroad equity and common railroad equity. I am also well acquainted with and have used financial industry accepted models for determining a firm's cost of equity, including Discounted Cash Flow Model ("DCF") models, Capital Asset Pricing Model ("CAPM"), Farma-French Three Factor Model and Arbitrage Pricing Models. I have also lectured in graduate level finance and economics classes discussing corporate capital theory and costs of equity determination, and am a member of the Professional Advisory Council for the Eller School of Management Finance Department at the University of Arizona.

In my tenure with L. E. Peabody & Associates, Inc., I have presented stand-alone cost evidence, including discounted cash-flow models and cost of capital determinations, in numerous proceedings before the STB, and presented evidence on railroad fuel surcharges in STB in Ex Parte No. 661, *Rail Fuel Surcharges.* I have submitted evidence on cost of capital determinations and related issues in Ex Parte No. 558 (Sub-No. 10), *Railroad Cost of Capital – 2006,* Ex Parte No. 558 (Sub-No. 11), *Railroad Cost of Capital – 2007*, Ex Parte No. 558 (Sub-No. 12), *Railroad Cost of Capital – 2008,* Ex Parte No. 558 (Sub-No. 13), *Railroad Cost of Capital – 2009,* Ex Parte No. 558 (Sub-No. 14), *Railroad Cost of Capital – 2010,* Ex Parte No. 664, *Methodology To Be Employed In Determining The Railroad Industry Cost Of Capital,* and Ex Parte No. 664 (Sub-No.1), *Use Of A Multi-Stage Discounted Cash Flow Model In Determining The Railroad Industry's Cost Of Capital.* In addition, my reports on railroad valuations have been used as evidence before the Nevada State Tax Commission.

STB Multi-Stage Discounted Cash Flow
Cost of Equity and Standard & Poor's Railroad Cost of Equity

		CSX		NSC		UNP	
	Year	STB MSDCF	S&P COE 1/	STB MSDCF	S&P COE 1/	STB MSDCF	S&P COE 1/
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	2008	17.0%	2/	16.5%	2/	15.5%	2/
2.	2009	13.6%	10.9%	14.8%	11.2%	13.0%	10.5%
3.	2010	14.0%	10.9%	15.1%	10.8%	13.8%	10.5%
4.	2011	16.7%	10.9%	16.8%	10.8%	15.0%	10.5%
5.	2012	18.3%	10.9%	17.7%	10.8%	15.5%	10.5%

1/ Standard & Poor's reported cost of equity in their equity research reports for the year after the STB MSDCF cost of equity, e.g., the CSX 2012 value of 10.9% was taken from a 2013 S&P Report. The lag is necessary to account for Standard & Poor's accounting for year-end railroad information.

2/ Standard and Poor's did not report a cost of equity for these periods in its Stock Report.

Note: Standard and Poor's did not report its cost of equity for the BNSF for the years 2008 and 2009, the last full years the BNSF's stock was publicly traded.

MarketGrader Railroad Costs of Equity - July 2013

Item	Source	MarketGrader Costs of Equity		
		CSX	NSC	UNP
(1)	(2)	(3)	(4)	(5)
1. Weighted Cost of Equity	MarketGrader Report	4.97%	5.62%	6.34%
2. Debt Weight	MarketGrader Report	49.30%	45.63%	31.61%
3. Equity Weight	100% - Line 2	50.70%	54.37%	68.39%
4. Unweighted Cost of Equity	Line 1 ÷ Line 3	9.80%	10.34%	9.27%
5. STB 2012 MS-DCF Cost of Equity	EP 558 (Sub-No. 16)	18.32%	17.65%	15.53%
6. % STB exceeds MarketGrader	(Line 5 ÷ Line 4) -1 x 100	87%	71%	68%

Sources: MarketGrader.com StockGrader Reports

EXHIBIT B

VERIFIED STATEMENT OF PROFESSOR JAMES E. HODDER

VERIFIED STATEMENT

OF

JAMES E. HODDER

My name is James E. Hodder. I am an Emeritus Professor at the University of Wisconsin-Madison, where I was the Charles and Laura Albright Professor of Finance in the Wisconsin School of Business from 1992-2012. I am also the Principal of a consulting firm, 5 Lakes Financial Research, LLC. My address is 100 E. Huron #4904, Chicago, Illinois, 60611. While I have retired from my teaching post, I remain active in research and consulting and am preparing to begin serving as an Economic Fellow at the Securities and Exchange Commission starting in the fall.

While at the Wisconsin School of Business, I also served as Chair of its Finance Department during 2004-2008 and 2011-2012. From 1978 to 1992, I served on the faculty of Stanford University, where I received my Ph.D. in Economics in 1979. My other academic degrees are a Bachelor of Science in Industrial Engineering from Stanford University, a Masters of Business Administration from the University of Michigan, and a Masters of Arts in Economics from the University of California (Berkeley).

At Wisconsin, I taught Corporate Finance at the graduate level as well as corporate-oriented courses on Financial Policy and on Multinational Business Finance at both graduate and undergraduate levels. In addition, I have taught several courses on options and other derivative securities. At Stanford, most of my teaching was in corporate finance with a particular focus on valuing manufacturing and technology investments.

A substantial portion of my research and publications has addressed the subjects of investment evaluation and discounting. A key aspect of those subjects is the firm or project cost of capital, including appropriate risk and inflation adjustments. Another substantial portion of my research has addressed corporate capital structure.

I previously have submitted testimony to the Surface Transportation Board ("Board") in several coal rate cases: on behalf of Wisconsin Power & Light in its case against Union Pacific Railroad Company, on behalf of PPL Montana in its case against the Burlington Northern and Santa Fe Railway Company, on behalf of the Western Fuels Association and the Basin Electric Power Cooperative in their case against the Burlington Northern and Santa Fe Railway Company, and on behalf of AEP Texas North Company in its case against BNSF Railway Company. I also provided testimony to the Board on several occasions on behalf of the Western Coal Traffic League ("WCTL") in connection with Ex Parte No. 664, Methodology to be Employed in Determining the Railroad Industry's Cost of Capital as well as with Ex Parte No. 664 (Sub-No. 1), Use of a Multi-Stage Discounted Cash Flow Methodology In Determining the Railroad Industry's Cost of Capital. My participation included a Verified Statement in December 2006, a Public Hearing in February 2007, a Verified Statement in September 2007, a Reply Verified Statement in October 2007, a Public Hearing in December 2007, and a Verified Statement in April 2008. A copy of my detailed curriculum vitae is included herewith as Appendix A.

In the current instance, I have been asked by counsel for WCTL to provide comments regarding the particular multi-stage discounted cash flow ("MSDCF") procedure mandated by the Board in Ex Parte No. 664 (Sub-No. 1), Use of a Multi-Stage Discounted Cash Flow Methodology In Determining the Railroad Industry's Cost of Capital.

As a starting point, the MSDCF estimate for the railroad cost of equity has exceeded the estimate using the Capital Asset Pricing Model ("CAPM") by a substantial amount in every year since the MSDCF procedure was adopted by the Board. This is illustrated in Table 1 below, where the estimates for 2008 – 2012 are based on the Board decisions for those years.

Table 1
Cost of Equity Estimates

	STB Decision 2008	STB Decision 2009	STB Decision 2010	STB Decision 2011	STB Decision 2012	Average
MSDCF Estimate	15.95%	13.34%	14.13%	15.83%	16.53%	15.16%
CAPM Estimate	10.39%	11.39%	11.84%	11.31%	10.27%	11.04%
Difference (MSDCF - CAPM)	5.56%	1.95%	2.29%	4.52%	6.26%	4.12%

Note that the MSDCF estimates have exceeded the CAPM estimates by an average of 4.12%, which is a very substantial deviation. Moreover, this does not seem to be a purely random occurrence. If the chance of the MSDCF estimate exceeding the CAPM estimate in any year were like a coin flip with a 50% probability of occurring, the probability of observing 5 years in a row with the MSDCF higher would be (.5)(.5)(.5)(.5)(.5) = .03125. Such a systematic and substantial deviation warrants investigation.

The particular MSDCF procedure mandated by the Board is a minor modification of an approach used by Morningstar/Ibbotson to estimate the cost of equity for a wide range of firms. The Morningstar/Ibbotson approach is a particular implementation of the general concept of finding the discount rate (cost of equity) that equates the Present Value from a stream of forecasted future cash flows to a firm's shareholders with the current market value of that firm's shares. Their implementation attempts a "one-size-fits-all" approach that turns out to be a poor

fit for the Class I Railroads used to estimate the Railroad Cost of Equity during the 2008-2012 period.

The Morningstar/Ibbotson approach uses a 3-stage model with a set of additional assumptions on how to estimate the annual cash flow available to shareholders during those 3 stages. The basic logic of a three stage model is as follows:

a) During the first stage, the firm is allowed to grow faster or slower than its long-run growth rate.

b) In the third stage, the firm grows at its long-run growth rate, which is usually chosen to match a forecast for long-run growth of the economy as a whole.

c) The middle (second) stage provides a transition period during which the growth rate from the first period can be gradually adjusted to the level of long-run growth in the final stage.

The Morningstar/Ibbotson approach corresponds to the above logic for the first and third stages; but the "transition" during the second stage is problematic for the set of large railroads studied. The Morningstar/Ibbotson approach uses the industry average growth rate for its second stage growth rate. This might be reasonable if the industry in question were expected to grow at roughly the same rate as the economy. However in the implementation adopted by the Board, the railroads whose cost of equity is being estimated have their first-stage growth rates averaged to obtain the "industry" average for stage two; and those (currently three) railroads are all forecast to grow substantially faster than the postulated long-run growth rate for the U.S. economy of 5.48%. To illustrate this point, consider the 2012 data in Table 2 below, which is taken from Table 11 in the Board's 2012 Decision. In what follows, I will frequently use the stock symbols give in that table as an abbreviated way to refer to specific railroads.

Table 2 2012 First Stage Growth Rate Estimates		
Company	Stock Symbol	Growth Rate
CSX Corporation	CSX	14.70%
Norfolk Southern Corporation	NSC	12.10%
Union Pacific Corporation	UNP	15.40%
Simple Average		14.07%

The lack of a gradual transition during the second stage of the model results in the estimated cash flows available to shareholders of all three railroads growing rapidly for 10 years then suddenly dropping from a growth rate of 14.07% to 5.48% annual growth thereafter. That is a drop approaching two-thirds in the annual growth rate for all three firms. From an economic perspective, this is not a reasonable transition. Moreover, it will result in a substantial upward bias of the cost of equity estimate from that model for each of the three railroads.

There is another problem with the transition structure between stages 2 and 3 in the Morningstar/Ibbotson approach as it applies to these three railroads. One has to dig into the calculations a bit in order to see this, but there is a massive upward jump in the estimated cash flow available to investors between the end of year 10 and the beginning of year 11 -- in effect, an "overnight" jump. Consider for example the 2012 MSDCF cost of equity estimate for CSX. Looking in Table 11 of the Board's 2012 Decision, one can see that the estimated cash flow value for the end of year 10 is 4,608 (million $). Using the formula for $IBEI_{10}$ from Appendix J of the AAR 2012 Opening Statement, one can work out that the cash flow to shareholders at the beginning of year 11 is $6,507 million. That represents a jump of 41.20% (or $1.899 billion) between the end of a year and the next day (beginning of the following year). Furthermore, as

indicated below in Table 3, there are similarly massive increases in the cash flow estimates for NSC and UNP.[1]

Table 3
Jump in 2012 MSDCF Cash Flow Estimates
($ millions)

Company	CSX	NSC	UNP
	$	$	$
Input for Terminal C.F.	1,697	1,734	3,327
Stage One Growth	14.70%	12.10%	15.40%
Stage Two Growth	14.07%	14.07%	14.07%
	$	$	$
Cash Flow End Year 10	4,608	3,965	10,343
	$	$	$
Cash Flow Beginning Year 11	6,507	5,928	13,150
	$	$	$
Dollar Increase (millions)	1,899	1,963	2,807
Percentage Jump	41.20%	49.52%	27.14%

These are not only large percentage increases but involve billions of dollars. This is not plausible and indicates another substantial flaw in the Morningstar/Ibbotson approach as it applies to these three railroads. Again, the result is to bias upward the cost of equity estimates for all three railroads.

There is a third major problem with the Morningstar/Ibbotson approach as it applies to these three railroads. The first stage growth rate for each firm is based on the median 3-5 year Earnings Per Share ("EPS") forecast for that firm by analysts contributing to the Institutional Brokers Estimate System ("IBES").[2] A key issue here is that forecast is for earnings per share rather than a firm-wide earnings forecast.[3] However, those growth rates are being applied to

[1] Input values are from Table 11 of the Board's 2012 Decision. The cash flows at the beginning of year 11 are calculated using the formula for $IBEI_{10}$ from Appendix J of the AAR 2012 Opening Statement.
[2] The IBES forecast is distributed by Thomson Financial.
[3] That the forecasts are for EPS is very clearly indicated on the computer screen shots from Thomson that are included as pages 2-4 of Appendix L of the AAR 2012 Opening Statement.

cash flow estimates based on firm-wide earnings, i.e., Income Before Extraordinary Items ("IBEI") plus some adjustments. The problem with this implementation arises because these three railroads have been engaged in major share buybacks (also called share repurchases) during the last several years. Such share buybacks serve to inflate EPS growth relative to firm-wide earnings growth.[4] Indeed, net share reductions will increase EPS even if the firm's earnings are not increasing. One could suggest that this aspect of the Morningstar/Ibbotson approach would not be a problem for firms that have not engaged in substantial share buybacks, but that has definitely not been the case for these three railroads as indicated in Table 4 below.[5] Thus, we have another major problem with the Morningstar/Ibbotson approach as applied to these three railroads.

Table 4

Annual Net Share Reduction Rates
a/o Q3 over the previous year Q3

	CSX	NSC	UNP
2008Q3	6.16%	4.36%	3.58%
2009Q3	0.48%	0.65%	0.38%
2010Q3	4.69%	1.22%	2.26%
2011Q3	6.47%	7.51%	2.03%
2012Q3	1.77%	5.98%	2.63%
5 Year Ave	3.91%	3.95%	2.17%
2010-2012 Ave	4.31%	4.91%	2.31%

[4] As a point of clarification, the buyback rates calculated below are based on shares outstanding and thus are net of any share issuance (e.g. in connection with the exercise of employee stock options). Hence, the term buyback or buyback rate should be interpreted in the sense of a net reduction in shares outstanding.

[5] In this table, I calculated buyback rates based on shares outstanding from firm 10-Q reports as of the third quarter for each year. The third quarter was utilized since the market value input to the MSDCF calculation uses that share amount.

If we consider the last 3 years, average buyback rates range from 2.31% to almost 5%. Buybacks were relatively small in 2009; but if we go back to 2008 and calculate a 5-year average, the rates are still large (2.17% to almost 4%). How did share buybacks affect analysts' EPS forecasts? We don't know unless each analyst tells us the particulars for their forecast. We do know that these share buyback programs are public information (e.g., discussed in firm annual reports) and have been going on at these three railroads for several years. So analysts should certainly be aware of the buybacks and take them into consideration when providing EPS estimates. If for example, an analyst projecting NSC's growth assumed an annual share buyback rate of 5% (using a round number for simplicity), the effect would be to add slightly more than 5% to the EPS growth forecast. The math is that each $1.00 of EPS without that share buyback becomes $1.00/.95 = $1.0526 of EPS when the buyback is considered. So if the analyst anticipates share buybacks, their EPS forecast would be increased by slightly more than the expected buyback rate; and thus, using an otherwise accurate EPS forecast in the MSDCF would over-estimate firm-wide earnings growth by slightly more than the buyback rate. Since the buyback rates have been quite substantial, this is a serious problem.

There could be some analysts that have been acting like Rip Van Winkle and are unaware of the buyback programs. If so, their EPS estimates would not be inflated by anticipated buybacks. One suspects this group is a small minority, since analysts presumably try to be accurate in their forecasts; but we don't actually know. It seems reasonable to think that the median analyst estimate has been inflated by anticipated buybacks.[6] Indeed, the median could be affected by a single analyst considering share buybacks for that firm. However, we don't

[6] The AAR seems to agree, or at least states that "WCTL has not demonstrated that the analysts who predict growth rates do not take into account the effects of stock issuances or repurchases on earnings per share in the future." See page 7 of the AAR Rebuttal Comments dated May 31, 2013 in connection with STB Ex Parte No. 558 (Sub-No. 16) Railroad Cost of Capital – 2012.

know which analysts considered buybacks; and we don't know what anticipated buyback rates they may have used in their forecasts.

If one wanted to adjust the first-stage growth rates for this problem, it would entail identifying the source of the median forecast and guessing at how much to reduce that forecast in order to get a growth rate that applies to firm-wide earnings. A reasonable basis for that guess is far from clear. Should we use the previous year's buyback rate, a 3-year average, a 5-year average, an average that gives more weight to recent years, or what? In fact, we ideally want a forward-looking estimate; and past history may not be that helpful. Moreover, it is likely there are different buyback rates buried in different analyst forecasts. If we somehow came up with analyst-specific adjustments to eliminate the buyback effects, a comparison of the adjusted forecasts could well result in a different median forecaster. This is a mess, and one with substantial implications for the cost of equity estimates generated by the Morningstar/Ibbotson approach for these three railroads.

Since the Board's MSDCF methodology effectively assigns great weight to the median forecast, the behavior of one or two analysts can have a major impact. Consequently, it seems appropriate to also comment on the general quality of the forecasts, in addition to the share buyback issue identified above. There are a limited number of forecasts (no more than five or six for each railroad in 2012), and there are large differences among them. For example in 2012, there are five estimates for CSX; and they range from a low of 4.6% to a high of 15%. Moreover, one of the two 15% forecasts has not been adjusted since July 2008, despite the substantial disruption that the economy has experienced since then. Indeed, that same analyst is depicted as also having a 15% forecast for NSC that has remained unchanged since September

2002, a period of over ten years. Thus, there are additional reasons to be concerned about this aspect of the MSDCF methodology.

There is also an issue with how the Morningstar/Ibbotson approach estimates the long-run growth rate for the U.S. economy that is used in stage 3 of the MSDCF estimates. That growth rate (currently estimated at 5.48%) uses a current long-run inflation forecast (2.26%) but an historic estimate for real GDP growth (3.22%).[7] Using history to predict the future is always a potential problem; and in the current economic environment, real GDP growth of 3.22% seems quite optimistic. For example, a June 2012 report from the Congressional Budget Office ("CBO") projects real GDP out to 2087.[8] Their 2087 projection of $85,300 billion (in 2012 dollars) compared with their estimate for 2022 (10 years beyond 2012) implies an annual growth rate over that 65-year period of 2.19%. PWC has a real GDP projection for 2050 with the U.S. at $37,998 billion (in 2011 dollars), which compared with their 2011 GDP figure of $15,094 billion implies an annual growth rate of 2.40%.[9] The OECD has published a projected real growth rate for the U.S. economy for 2011 – 2060 of 2.1%.[10] The Conference Board has an annual real GDP growth projection for the U.S. economy during 2019-2025 (a substantially shorter period) of 2.0% in its Base Scenario and 2.4% in its Optimistic Scenario.[11] Since the MSDCF Terminal Value calculation is quite sensitive to the assumed long-run growth rate, this is another aspect of the Morningstar/Ibbotson approach that warrants re-examination.

---

[7] See page 40 of the VS of Witness Gray in the ARR 2012 Opening Statement.
[8] See Appendix B: Long-Term Projections Through 2087 in *CBO: The 2012 Long-Term Budget Outlook*, June 2012. That document as well as data for the appendix is available at http://cbo.gov/publication/43288. The real GDP projections can be found in the worksheet named "Economic Vars and Population".
[9] See Table 1 of *World in 2050: The BRICs and Beyond*, January 2013, available at http://www.pwc.com/gx/en/world-2050/the-brics-and-beyond-prospects-challenges-and-opportunities.jhtml
[10] See Table A.1 of "Looking to 2060: Long-term global growth prospects," OECD Economic Policy Policy Papers, No. 3, November 2012, available at http://www.oecd.org/eco/outlook/lookingto2060.htm
[11] See *Global Economic Outlook 2013, May 2013 Update*, available at http://www.conference-board.org/data/globaloutlook.cfm

In summary, there are several substantial problems with using the Morningstar/Ibbotson MSDCF model for estimating a railroad industry cost of capital. These problems are not inherent characteristics of MSDCF models generally, but rather results of particular assumptions made by Morningstar/Ibbotson in implementing their version of the more general model. Their assumptions may be ok for some firms in other industries but are clearly inappropriate for the three railroads whose costs of equity are being estimated. Moreover, the problems with their assumptions are individually substantial and all result in upward biases to the estimated cost of equity. Collectively, they should explain much of the difference between the CAPM estimate and the Morningstar/Ibbotson MSDCF estimate.

It is important to note that these problems with the Morningstar/Ibbotson approach have affected the MSDCF cost of equity estimates since 2008, when that approach was adopted by the Board. In other words, the Morningstar/Ibbotson MSDCF cost of equity estimates during that period are not reliable and are biased upward. Hence, the CAPM estimates during that period are apt to be far more accurate and credible than the MSDCF estimates. To the extent that investment decisions by the railroads were influenced by those MSDCF estimates, there has been a misallocation of capital. The problems with the Morningstar/Ibbotson approach are substantial and have important implications. This issue has been going on for too long and warrants immediate attention by the Board.

VERIFICATION

I, James E. Hodder, declare under penalty of perjury, that the foregoing Statement is true and correct, and that I am qualified and authorized to file this Statement.

James E. Hodder

Executed on
August 26, 2013

Appendix A: Curriculum Vitae

JAMES E. HODDER

5 Lakes Financial Research
100 E. Huron #4904
Chicago, Il 60611

Phone: (608) 347-8774
Email: jhodder@alumni.stanford.edu

Areas of Specialization: Corporate Finance, Derivative Securities, and International Finance

Education:

1967	B.S.	Industrial Engineering, Stanford University
1968	M.B.A.	Business Administration, University of Michigan
1976	M.A.	Economics, University of California (Berkeley)
1979	Ph.D.	Economics, Stanford University

Dissertation: The Hedging of Exposure to Exchange-Rate Movements

Employment:

1968-69	Sylvania Electronic Systems: Project Administrative Engineer
1969-73	U.S. Navy: Engineering Duty Officer
1974-76	Department of Economics, University of California (Berkeley): Research and Teaching Assistant
1976-78	Department of Economics, Stanford University: Teaching Assistant and Instructor
1978-92	Department of Industrial Engineering and Engineering Management, Stanford University: Assistant Professor and Associate Professor, Associate Chairman 1987-1988, Ph.D. Program Director 1987-1992
1992-2012	School of Business, University of Wisconsin - Madison: Charles and Laura Albright Professor of Finance 1992-2012, Director of Quantitative Masters in Finance (QMF) Program 1995-2004, Department Chair 2004-2008 and 2011-2012, Emeritus Professor since 2012
2012-	5 Lakes Financial Research: Principal

Visiting Appointments:

1986	Visiting Scholar, Department of Economics, Osaka University -- funded by a fellowship from the Japan Society for the Promotion of Science
1990-91	Visiting Associate Professor, School of Business, University of Wisconsin - Madison

Teaching:

Derivative Securities
Advanced Derivatives
Contemporary Topics – Hedge Funds
Corporate Finance
Fixed Income and Derivative Securities
Options and Financial Futures
Ph.D. Seminar: Interest Rate and Credit Risk Models
Ph.D. Seminar: Risk Management in Financial Institutions
Multinational Business Finance
Financial Policy
Doctoral Seminar in Financial Decisions
Engineering Economy
International Economics

Awards:

Outstanding Teacher, Department of Industrial Engineering and Engineering Management, Stanford University, 1981-82 and 1986-87

Lawrence J. Larson Award for Excellence in Teaching, School of Business, University of Wisconsin-Madison, 1999

Wisconsin Idea Fellow, in recognition of extraordinary public service on behalf of the University of Wisconsin, 2004-2005

University Service:

Stanford:

Affiliate Faculty Department of Economics, 1979–1992.
Fellow of the Northeast Asia – U.S. Forum on International Policy, 1980-1992.
Faculty Liaison for IEEM Industrial Affiliates Program, 1982-1992.
School of Engineering Undergraduate Council, 1984-1991.

Wisconsin:

Business School, Subcommittee of the Executive Committee, 1993-1996, 1999-2001 and 2002-2003, Chair 1994-1995.
Business School Academic Planning Council, 1994 -1998.
East Asian Studies Faculty, 1994-2012.
Center for World Affairs and the Global Economy, 1995-2002 and 2008-2012.
University Social Sciences Divisional Committee, 2002-2004.
Global Studies Faculty, 2004-2012.
Business School Operations Committee, 2005-2008.
University Faculty Senate, 2009-2012.

Publications:

1. "Foreign Investment from the Firm's Perspective," in D. Bonham-Yeaman, ed., Developing Global Corporate Strategies, Academy of International Business and European International Business Association Joint Conference, Barcelona, Spain, December, 1981.

2. "Exposure to Exchange Rate Movements," Journal of International Economics, November, 1982.

3. "Plant Location Modeling for the Multinational Firm," with J. V. Jucker, Proceedings of the Academy of International Business Conference on the Asia-Pacific Dimension of International Business, Honolulu, Hawaii, December, 1982.

4. "Financial Market Approaches to Facility Location Under Uncertainty," Operations Research, November-December, 1984.

5. "Pitfalls in Evaluating Risky Projects," with H. E. Riggs, Harvard Business Review, January-February, 1985. This article has also been reprinted in Managing Projects and Programs, Harvard Business School Press, 1989 and as Chapter 3 in Kim B. Clark and Steven C. Wheelwright, eds., The Product Development Challenge, Harvard Business School Press, 1995.

6. "Pricing to Reduce Investment When Costs Follow an Experience Curve: Constrained Dynamic Programming as well as Heuristic Rules," with Y. A. Ilan, Proceedings of the American Institute for Decision Sciences Fourteenth Annual Meeting, Western Regional Conference, Monterey, California, March, 1985.

7. "International Plant Location Under Price and Exchange Rate Uncertainty," with J. V. Jucker, Engineering Costs and Production Economics, April, 1985.

8. "Some Aspects of Japanese Corporate Finance," with A. E. Tschoegl, Journal of Financial and Quantitative Analysis, June, 1985. This article is also reprinted as Chapter 3 in Edwin J. Elton and Martin J. Gruber, eds., Japanese Capital Markets, Harper-Row, 1990.

9. "A Simple Plant Location Model for Quantity-Setting Firms Subject to Price Uncertainty," with J. V. Jucker, European Journal of Operational Research, July, 1985.

10. "Evaluation of Manufacturing Investments: A Comparison of U.S. and Japanese Practices," Financial Management, Spring, 1986. This article has also been reprinted in Stephen H. Archer and Halbert S. Kerr, eds., Readings and Cases in Corporate Finance, McGraw-Hill, 1988.

11. "Capital Cost: Difference Between U.S. and Japan Shrinks" (in Japanese), Nihon Keizai Shimbun, August 30, 1986.

12. "A Multifactor Model for International Facility Location and Financing Under Uncertainty," with M. C. Dincer, Computers and Operations Research, 1986.

13. "Declining Prices and Optimality When Costs Follow an Experience Curve," with Y. A. Ilan, Managerial and Decision Economics, December, 1986.

14. "Technology Transfer and Second Sourcing when Production Costs Follow an Experience Curve," with Y. A. Ilan, IEEE Transactions on Engineering Management, February, 1987.

15. "Simple Solution Procedures for Nonlinear Programming Problems that are Derivative Decomposable," with R. C. Carlson and J. V. Jucker, European Journal of Operational Research, July, 1987.

16. "Corporate capital structure in the United States and Japan: financial intermediation and implications of financial deregulation," in John B. Shoven, ed., Government Policy Towards Industry in the USA and Japan, Cambridge University Press, 1988.

17. "On Dumping at Less than Marginal Cost," in Developments in Pacific-Asian Business: Education and Research, Volume 2, Pacific Asian Management Institute, 1989.

18. "A Commentary on 'Japanese Capital Exports through Portfolio Investment in Foreign Securities,'" in Charles A. E. Goodhart and George Sutija, eds., Japanese Financial Growth, Macmillan (London), 1990.

19. "Agency Problems and International Capital Structure," with L. W. Senbet, in S. Ghon Rhee and Rosita P. Chang, eds., Pacific Basin Capital Markets Research, Elsevier, 1990.

20. "Valuing Flexibility as a Complex Option," with A. J. Triantis, Journal of Finance, June, 1990.

21. "International Capital Structure Equilibrium," with L. W. Senbet, Journal of Finance, December, 1990.

22. "Is the Cost of Capital Lower in Japan?", Journal of the Japanese and International Economies, March, 1991.

23. "The Cost of Capital for Industrial Firms in the U.S. and Japan," in William T. Ziemba, Warren Bailey, and Yasushi Hamao, eds., Japanese Financial Market Research, Elsevier, 1991.

24. "Corporate Finance in Japan," with A. E. Tschoegl, in Shinji Takagi, ed., Handbook of Japanese Capital Markets, Basil Blackwell, 1993.

25. "Valuing Flexibility: An Impulse Control Framework," with A. J. Triantis, Annals of Operations Research, vol. 45, 1993.

26. "Cross-holdings: Estimation Issues, Biases and Distortions," with M. Fedenia and A. J. Triantis, Review of Financial Studies, Spring, 1994.

27. "Risk Management and Assessment," in Richard C. Dorf, ed., Handbook of Technology Management, CRC Press, 1998.

28. "Pricing Models with Transaction Fees," with T. Zariphopoulou, in W. M. McEneaney, G. Yin, and Q. Zhang, eds., Stochastic Analysis, Control, Optimization and Applications: A Volume in Honor of W. H. Fleming, Birkhauser Boston, 1999.

29. "Multinational Capital Structure and Financial Flexibility," with K. Singh, Journal of International Money and Finance, vol. 19, 2000.

30. "Numerical Schemes for Variational Inequalities Arising in International Asset Pricing," with A. Tourin and T. Zariphopoulou, Computational Economics, February, 2001.

31. "Valuing Real Options: Can Risk Adjusted Discounting Be Made To Work?," with A. S. Mello and G. S. Sick, Journal of Applied Corporate Finance, Summer, 2001.

32. "Corporate Finance," in Allan Bird, ed., Encyclopedia of Japanese Business and Management, Routledge, 2002.

33. "Debt/Equity Ratios," in Allan Bird, ed., Encyclopedia of Japanese Business and Management, Routledge, 2002.

34. "Incentive Contracts and Hedge Fund Management," with J. C. Jackwerth, Journal of Financial and Quantitative Analysis, December, 2007 (Lead Article).

35. "Managerial Responses to Incentives: Control of Firm Risk, Derivative Pricing Implications, and Outside Wealth Management," with J. C. Jackwerth, Journal of Banking and Finance, June, 2011.

36. "Recovering Delisting Returns of Hedge Funds," with J. C. Jackwerth and O. Kolokolova, Journal of Financial and Quantitative Analysis, forthcoming.

Published Book Reviews:

"Review of The Economic Analysis of Industrial Projects by Lynn E. Bussey," James E. Hodder and James V. Jucker in The Engineering Economist, Winter, 1980.

"Review of Investment Analysis and Management by Anthony J. Curley and Robert M. Bear," in The Engineering Economist, Spring, 1980.

Research in Progress:

"Hedge Fund Performance: Attribution, Time Variation, and Persistence," with J. C. Jackwerth and O. Kolokolova.

"Improved Portfolio Choice Using Second Order Stochastic Dominance," with J. C. Jackwerth and O. Kolokolova.

Testimony:

Wisconsin Power and Light Company vs. Union Pacific Railroad Company, Surface Transportation Board, Verified Rebuttal Statement, September 2000.

PPL Montana, LLC vs. Burlington Northern and Santa Fe Railway Company, Surface Transportation Board, Verified Rebuttal Statement, April 2001.

Xcel Energy vs. United States Government, Expert Report (March), Rebuttal Report (May), Deposition (June), 2006.

Surface Transportation Board, Methodology to be Employed in Determining the Railroad Industry's Cost of Capital, Verified Statement (December 2006), Public Hearing (February

2007), Verified Statement (September 2007), Reply Verified Statement (October 2007), Public Hearing (December 2007).

Deutsche Finance New Zealand vs. New Zealand Commissioner of Inland Revenue, Witness Statement, October 2007.

Surface Transportation Board, Use of a Multi-Stage Discounted Cash Flow Methodology In Determining the Railroad Industry's Cost of Capital, Verified Statement, April 2008.

Bank of New Zealand vs. New Zealand Commissioner of Inland Revenue, Witness Statement (July 2008), Supplementary Statement in Reply (December 2008), Testimony New Zealand High Court (May 2009).

Western Fuels Association, Inc. and Basin Electric Power Cooperative, Inc. vs. BNSF Railway Co, Surface Transportation Board, Verified Statement, August 2008.

AEP Texas North Company vs. BNSF Railway Co, Surface Transportation Board, Verified Statement (September 2008); Remand from U.S. Appeals Court, DC Circuit, Verified Statement (January 2011).

Westpac Banking Corporation vs. New Zealand Commissioner of Inland Revenue, Witness Statement (November 2008), Supplementary Statement in Reply (March 2009), Testimony New Zealand High Court (July 2009).

Blum vs. Commissioner of Internal Revenue, Expert Report (January 2011), Testimony U.S. Tax Court Los Angeles (February 2011).

Professional Societies:

American Finance Association
Global Association of Risk Professionals
Professional Risk Managers' International Association
Western Finance Association