TransGrid

Response to the ACCC's Draft Decision on TransGrid's 2004/05-2008/09 Revenue Caps:

Section 5 of 6

TransGrid's Regulated Rate of Return

Non Confidential Version

September 2004

5. TRANSGRID'S REGULATED RATE OF RETURN

5.1 Introduction

TransGrid notes the Commission's analysis and approach in relation to setting TransGrid's weighted average cost of capital (WACC) in the draft decision. In relation to the equity beta, TransGrid commends the Commission's decision to not adopt the 'market data' approach foreshadowed in the discussion paper on the draft statement of regulatory principles. The adoption of 10 year bond rates as the reference point for determining the risk free rate of return on debt is also supported.

However, TransGrid has asked Professor Bruce Grundy (Ian Potter Professorial Fellow in Corporate Finance at the Melbourne Business School, University of Melbourne) to review the Commission's decision on the cost of debt for TransGrid. Professor Grundy (refer Appendix 5A) has raised a number of concerns which we would like the Commission to consider further. In particular, Professor Grundy notes that:

- [Confidential]
- the Commission's reliance on government owned businesses in its benchmarking of TransGrid's a credit rating results in the choice of an upwardly biased credit rating; and
- the use by the Commission of the standard convention when quoting bond yields results in a material underestimate of the true cost of capital per annum.

5.2 Confidential

5.3 Benchmarking a Credit Rating

The Commission draft decision sets TransGrid's credit rating based on a benchmarking process whereby comparable corporations were chosen from the Standard and Poor's publication "S&P Australian Report Card Utilities".

The draft decision does not explain the critieria by which these corporations were chosen. However, TransGrid notes that 5 of the 9 businesses chosen are government owned (four of these are owned by Australian State Governments while SPI PowerNet is owned by the Singapore Government). . TransGrid further notes that only 7 of the 23 businesses listed by Standard and Poor's, are government owned (the other two being Sydney Water and Delta Electricity). That is, the Commission's sample includes only 39% of all businesses in the S&P sample but 71% of all government owned businesses.

There appears to be a potential conflict in this approach with the Code requirement that the estimated WACC be consistent with the WACC of a privately owned business.

> *"The weighted average cost of capital is a "forward looking" weighted average cost of debt and equity for a commercial business entity. Accordingly, the Network Owner's weighted average cost of capital will represent the shadow price or social opportunity cost of capital as measured by the rate of return required by investors in a privately-owned company with a risk profile similar to that of the network company."* (6.1.2.1)

The Draft Decision "notes the concern that including government-owned companies in the sample may bias the credit rating upward". However, the Commission "considers that government/parent ownership ... would not create a significant bias to the sample." However, this is in direct conflict with other statements made by the Commission in relation to benchmarking the credit rating for gas transport businesses:

> *"The benchmarking approach to establishing the debt margin requires the consideration of two distinct empirical questions: the appropriate benchmark credit rating of the service provider; and the market observed debt margin associated with the benchmark credit rating.*
>
> *With regard to the benchmark credit rating of the service provider, the Commission considers that the relevant Code provisions (sections 8.30 and 8.2(e)) are best met by reference to Australian gas transmission companies. It is important for consistency with other parameter assumptions that these companies are stand alone entities and* ***are devoid of government ownership****. In addition, it is important that the gearing ratio of the entities used to calculate the debt margin are not significantly different from the gearing assumptions used to determine the WACC."* (Emphasis added.)[1]

The exclusion of Government owned businesses led the ACCC to conclude a credit rating of BBB+ was appropriate. This conclusion was reviewed by the Australian Competition Tribunal which found that the ACCC had erred in its calculations and that, based on the sample of privately owned businesses, the correct conclusion was that a BBB credit rating was justified. In fact the ACT states, "…the only rational conclusion from the chosen class is that a credit rating of BBB is appropriate".[2] This is a full credit rating below the level the "A" credit rating the ACCC has allowed for TransGrid.

Professor Grundy has examined the consistency of the Commission's approach with its requirement to estimate the cost of capital for a *privately-owned company with a risk profile similar to that of the network company*. In particular, he has been asked to examine whether there may be some other reasons that justify the Commission's selection of predominantly government owned businesses in the benchmark. In this regard Professor Grundy concluded:

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1 Page 120 of ACCC October 2003 Final Decision for the MSP.

2 Page 28 Australian Competition Tribunal decision on "Application by East Australia Pipeline Limited [2004] ACompT8"

> "I conclude that the inclusion of the government-backed companies in the sample does create a significant bias and that there is a significant upward bias in the ACCC's estimated credit rating. The reasons that underlie this conclusion are set out below."

Professor Grundy's reasons include the following:

- in assigning a credit rating Standard & Poor's explicitly states that the subsidiaries' ratings reflect the strength of the parental-backing. For example, a June 1, 2004 press release by S&P states that the A+ rating of *SPI PowerNet*'s debt reflects "insulation from competitive pressures afforded by the company's natural monopoly, the stability and transparency of the regulatory regime under which the company operates, <u>and its ownership by a strong and supportive parent, SingPower</u>. These strengths are offset by the company's aggressive financial structure and weak liquidity" (emphasis added);

- there is no material difference between the activities of private and government owned companies in the Commission's sample - yet the average credit rating is materially different (AA+ versus A-). That is, the lower credit rating of A- for privately owned companies in the Commission's sample cannot be adequately explained except by virtue of differences in ownership;

- taking a wider sample of privately owned businesses would result in a benchmarked credit rating of less than A-. For example, *United Energy* is not included in the Commission's benchmark calculation yet its activities mirror those of *Ergon Energy* exactly. *United Energy* is not government-backed and has a credit rating of BBB. *Ergon Energy* is government-backed and has a credit rating of AA+. Similar statements[3] can be made concerning *AGL* (A), *Atlinta* (BBB) and *TXU* (BBB) which were not included by the Commission. TransGrid considers this of particular concern because the Commission did include AGL as a comparable to TNSP's in its discussion of benchmarking equity betas (ACCC Discussion Paper on the Draft Statement of Regulatory Principles).

We reproduce Professor Grundy's 'Table I' below which provides details on all utilities rated in the Standard and Poor's publication and also provides details on their activities.

3 *AGL*'s activities mirror those of *Country Energy*. With the exception of Electric Plant Ownership and Operation, the activities of *Atlinta* and *TXU* also mirror those of *Country Energy*.

Table I

Company Name	S&P Rating	State Owned?	Electric Trans	Electric Dist	Electric Retail	Gas Retail	Gas Dist	Gas Dist Pipeline Owner	High Pressure Gas Trans	Electric Plant Owner / Operator
Ergon Energy Corporation Ltd	AA+	Y	N	Y	Y	N	N	N	N	N
Country Energy	AA	Y	N	Y	Y	Y	Y	Y	N	N
EnergyAustralia	AA	Y	N	Y	Y	Y	Y	N	N	N
Integral Energy	AA	Y	N	Y	Y	Y	N	N	N	N
SPI Powernet	A+	N	Y	N	N	N	N	N	N	N
Citipower Trust	A-	N	N	Y	N	N	N	N	N	N
ETSA Utilities Finance Pty Ltd	A-	N	N	Y	N	N	N	N	N	N
Powercor Australia LLC	A-	N	N	Y	N	N	N	N	N	N
ElectraNet Pty Ltd	BBB+	N	Y	N	N	N	N	N	N	N
Sydney Water Corp	AAA	Y	N	N	N	N	N	N	N	N
Delta Electricity	AA-	Y	N	N	N	N	N	N	N	Y
Australian Gas Light Co.	A	N	N	Y	Y	Y	Y	Y	N	N
Origin Energy Ltd	A-	N	N	N	Y	Y	Y	N	N	Y
Snowy Hydro Ltd	BBB+	N	N	N	N	N	N	N	N	Y
Alinta Ltd	BBB	N	N	Y	Y	Y	Y	Y	N	Y
Edison Mission Energy Australia Ltd	BBB	N	N	N	N	N	N	N	N	Y
Envestra Ltd	BBB	N	N	N	N	N	Y	Y	N	N
GasNet Australia (Operations) Pty Ltd	BBB	N	N	N	N	N	N	N	Y	N
TXU Australia Holdings Ltd	BBB	N	N	Y	Y	Y	Y	Y	N	Y
United Energy Distribution Pty Ltd	BBB	N	N	Y	Y	N	N	N	N	N
Duke Energy Australia Pty Ltd	BBB-	N	N	N	N	N	N	N	Y	Y
Energy Partnership (Gas) Pty Ltd	BBB	No information found on the web								
Diversified Utility and Energy Trust	BBB-	Infrastructure investment vehicle								

Electric Trans	Transmit electricity from generator to distribution networks via high-voltage lines
Electric Dist	Distribute electricity from transmitters to retail/commercial points of sale
Electric Retail	Retailers are not necessarily distributors
Gas Dist	Distribute gas from high pressure pipelines to retail/commercial points of sale
Gas Dist Pipe Owner	Gas distributors are not necessarily the pipeline owners
High Pressure gas Trans	Transport gas from gas fields to gas distribution pipelines

TransGrid notes that simply including *United Energy* in the Commission's sample will reduce the average yield to A-. This is true without even attempting to account for the fact that 5 of the credit ratings in the Commission's sample are already biased upwards. Excluding these observations would result in a credit rating of BBB+ to A-.

On the basis of the above analysis Professor Grundy advises that a conservative (ie, still biased upwards) approach would be for the ACCC to adopt a credit rating of A- or below for TransGrid. TransGrid commends this conclusion to the Commission.

5.4 Yield Quoting Convention

Professor Grundy also makes an important point in relation to the convention for quoting yields in Australia (including that used by CBASpectrum). The standard convention is to quote an X% per annum yield when a bond pays a coupon of ½X every six months. However, this not an X% per annum yield according to the convention effectively used in the Commission's PTRM modeling. The PTRM modeling requires that the yield be the compounded yield over a 12 month period. In effect, this means that a quoted yield of X% should be converted into a yield of $(1+ \frac{1}{2} X)^2 -1$. For example, if the standard quoted yield is 10% the yield the Commission should use in the PTRM is 10.25%.

Importantly, this adjustment to quoted yields should be applied when calculating the cost of equity as well as the cost of debt. However, in the case of the cost of equity, this adjustment should be performed prior to the addition of the cost associated with beta risk. That is, the quoted risk free rate should be adjusted and the beta risk should be added to that as per ACCC standard practice.

5.5 Conclusions

The ACCC approach to setting the debt margin in biased downwards in two important respects. TransGrid recommends the ACCC amend their final decision to remove these biases by:

- [Confidential.]; and
- Adding around 9 basis points to the costs of debt as a result of adopting an A- credit rating rather than an A credit rating (based on CBA Spectrum reported differential in yields between A and A- corporate bonds on 2 July 2004).

In addition around 3 basis points needs to be added to the real risk free rate (and around 9 basis points to the nominal risk free rate) used in the draft decision to convert the yield quoting convention to a compounded yield over a single 12 month period.

APPENDIX 5A

AN ANALYSIS OF SECTION 6.5 OF THE NSW AND ACT TRANSMISSION NETWORK REVENUE CAP TRANSGRID: DRAFT DECISION DATED 28 APRIL 2004

REPORT BY BRUCE DAVID GRUNDY

Date of this report: 1 July, 2004

1. My full name is Bruce David Grundy. I am a Professor of Finance at the Melbourne Business School, University of Melbourne and hold the chair entitled Ian Potter Professorial Fellow in Corporate Finance. My curriculum vitae appears in Schedule 1 to this Statement.

2. I have been asked by *TransGrid* to advise on section 6.5 of the *TransGrid* draft decision dated 28 April, 2004.

3. The Draft Decision estimates the cost of debt on commercial loans of a given rating as the sum of the 10-year risk-free rate plus the debt margin on 10-year corporate debt of that rating. The goal of this estimation is to determine the cost of 10-year debt to *TransGrid*.

4. The relevant debt margin is determined via a two-step process. In the first step, an estimate is made of the credit rating of an electricity company with a 60% gearing ratio. In the second step, an estimate is made of the debt margin on 10-year corporate debt with a credit rating equal to the rating estimated in step one.

5. This report has four parts. Parts 1 and 2 consider the Draft Decision's implementation of the two steps. Part 3 discusses a convention in quoting bond yields that is relevant to the determination of the cost of debt and the WACC. Part 4 contains my conclusions.

Part 1. The Draft Decision's estimate of the credit rating of an electricity company with 60% gearing

6. Table 6.1 of the draft decision sets out the S&P ratings of nine electricity companies. Four of these nine companies are government-backed and they having ratings of AA+, AA, AA and AA. The other five are not government-backed and they have lower ratings: A+, A-, A-, A- and BBB+. The Draft Decision "notes the concern that including government-owned companies in the sample may bias the credit rating upward". However, the ACCC "considers that government/parent ownership … would not create a significant bias to the sample." The Draft Decision does not explain how it reached its conclusion that the bias is insignificant despite the fact that the four the government-backed companies have higher credit ratings than the non-government-backed companies.

7. I conclude that the inclusion of the government-backed companies in the sample does create a significant bias and that there is a significant upward bias in the ACCC's estimated credit rating. The reasons that underlie this conclusion are set out below.

8. The first reason is that in understanding the credit ratings Standard & Poor's attaches to businesses in the ACCC's sample it is important to understand the ownership structure of those entities –both the private and the government owned businesses. Four of the five non-government-backed companies are subsidiary companies. In each case, Standard & Poor's states that the subsidiaries' ratings reflect the strength of the parental-backing.

9. *SPI PowerNet* is a wholly owned subsidiary of *SingPower*. The March 30, 2004 S&P Australian Report Card Utilities states that "Although the outlook on *SPI PowerNet Pty Ltd* was revised to stable from positive on Feb 20, 2004, this was based on a detailed review of support from the company's parent, *Singapore Power Ltd* … and does not reflect any weakening of *SPI Powernet*'s business profile." Parental backing adds value to, and increases the rating of, a subsidiary's debt. Just how much value is added depends on three things:

   (a) The optimality from the parent's point of view of the trade-off between the subsidiary avoiding costs of financial distress and the parent bearing the costs of bailing out subsidiary debt-holders;

(b) The strength of the subsidiary on a stand-alone basis, and hence the need for parental backing; and

(c) The credit quality of the parent, and hence its ability to provide backing to the subsidiary.

10. A June 1, 2004 press release by S&P states that the A+ rating of *SPI PowerNet*'s debt reflects "insulation from competitive pressures afforded by the company's natural monopoly, the stability and transparency of the regulatory regime under which the company operates, <u>and its ownership by a strong and supportive parent, SingPower</u>. These strengths are offset by the company's aggressive financial structure and weak liquidity" (emphasis added).

11. Similarly, *Citipower Trust, ETSA Utilities* and *Powercor* are all wholly owned subsidiaries of two related entities, *Cheung Kong Infrastructure* and *Hongkong Electric Holdings*. The three Australian subsidiaries are each rated A-. The March 30, 2004 S&P Australian Report Card Utilities notes in each case that the subsidiaries' ratings are tied to the credit quality of the parent and "will until such a time as … the prospect of adequate support begins to diminish."

12. The second reason for reaching the conclusion in paragraph 7 is that I have undertaken a further analysis of the effect of government ownership on the credit ratings of utilities. Table I of this Report provides Standard and Poor's credit rating for the full set of companies in the publication "S&P Australian Report Card Utilities". Also provided is a description of the government ownership of each company and the activities of each company (as determined from an examination of each company's website).

13. From this table it can be seen that the average credit rating of government owned companies is AA, while the average credit rating of privately owned companies is BBB to BBB+. Within the ACCC's sample the Government owned entities having an average credit rating of AA and the privately owned entities having a credit rating of A-. While there may be a material difference between the activities of some of the private and government owned companies in the full sample, no such material differences exist in the ACCC's sample. That is, the lower credit rating of A- for privately owned companies in the ACCC's sample cannot obviously be explained by differences in activities.

14. Turning to the extended sample, some further matching of activities can be

undertaken. First, the activities of privately owned *United Energy* match those of companies in the ACCC sample. *United Energy*'s rating is only BBB. Second, the activities of state-owned *Delta Electricity* (AA-) match those of the private companies *Snowy Hydro Ltd* (BBB+) and *Edison Mission Energy* (BBB). Again, the government owned entity has a higher rating than the private companies. Further, while no other company undertakes activities like those of state-owned *Sydney Water*, *Sydney Water*'s rating of AAA is higher than that of any other utility.

15. On the basis of these facts I conclude that the ACCC's use of Government owned entities in its sample materially biases the benchmarked credit rating upwards. Given the existence of this bias, and having regard to the difference in the credit ratings of otherwise similar private and government companies in the full sample, it would be conservative to adopt an A- credit rating for *TransGrid*. Note that A- is the average credit rating of the privately owned companies in the ACCC's sample.

16. As an alternative to including the four upward-biased ratings of government-backed debt in order to increase the sample size, one might consider including other companies in S&P Australian Report Card Utilities beyond the nine selected for inclusion in the Draft Decision's Table 6.1. Such an approach would result in a benchmarked credit rating of less than A-.

17. The basis for selecting the set of companies included in Table 6.1 is not completely clear. As noted, *United Energy* is not included in Table 6.1. Yet its activities mirror those of *Ergon Energy* exactly. *United Energy* is not government-backed and has a credit rating of BBB. *Ergon Energy* is included in Table 6.1. *Ergon Energy* is government-backed and has a credit rating of AA+.

18. *AGL* (A) , *Atlinta* (BBB) and *TXU* (BBB) are not included in Table 6.1. *AGL*'s activities mirror those of *Country Energy*. With the exception of Electric Plant Ownership and Operation, the activities of *Atlinta* and *TXU* also mirror those of *Country Energy*. It may be that the ACCC considers that gas activities and electricity plant ownership and operation are more risky than electricity transmission, distribution and retail activities. It may also be that the ACCC therefore considers that the inclusion of *AGL*, *Atlinta* and *TXU* in the sample would have induced a significant downward bias in the Draft Decision's estimate of the credit rating of an electricity company with 60% gearing. The Draft Decision though does not contain any discussion on this point.

Part 2. The Draft Decision's estimate of the debt margin

[Confidential.]

Part 3. A convention in quoting bond yields

29. The Draft Decision adds an 87 basis point benchmark spread to a 5.89% nominal risk-free rate to obtain a nominal cost of debt of 6.76%. CBASpectrum yields and spreads are quoted using the following convention concerning compounding intervals: Consistent with the semi-annual payment of interest on government and corporate debt, a quoted rate of 6.76% per annum actually means that a lender will earn a 3.38% return over six months. $3.38\% = \frac{6.76\%}{2}$.

30. A quoted rate of 6.76% per annum actually means that a lender will earn 6.874% return over a full year. $6.874\% = 1.0338 \times 1.0338 - 1$. Thus a quoted rate of 6.76% based on half-yearly compounding actually means 6.874% with annual compounding.

31. When the WACC is a determinant of allowed annual revenues, consistency requires that one use an annual compounding interval. This means in this example a cost of debt of 6.874% per annum (and not the quoted 6.76%).

32. An analogous issue arises in the determination of the cost of equity component of the WACC. Suppose that the equity of a company has a beta of one. The cost of equity is the annual risk-free rate plus the annual market risk premium (MRP). Given a 6% MRP, the cost of equity is 12.874% = 6.874% + 6% per annum (and not 12.76%).

Part 4. Conclusions

33. I have undertaken an analysis of (i) the external backing of and (ii) the activities undertaken by the set of companies in Table 6.1 of the Draft Decision and the full set of companies included in the March 30, 2004 S&P Australian Report Card Utilities. Based on this analysis, it is my opinion that the credit rating of the long-term debt of a stand-alone electricity transmission and distribution company with 60% gearing would be A- or below.

34. [Confidential]

35. [Confidential.]

Table I

Company Name	S&P Rating	State Owned?	Electric Trans	Electric Dist	Electric Retail	Gas Retail	Gas Dist	Gas Dist Pipeline Owner	High Pressure Gas Trans	Electric Plant Owner / Operator
Ergon Energy Corporation Ltd	AA+	Y	N	Y	Y	N	N	N	N	N
Country Energy	AA	Y	N	Y	Y	Y	Y	Y	N	N
EnergyAustralia	AA	Y	N	Y	Y	Y	Y	N	N	N
Integral Energy	AA	Y	N	Y	Y	Y	N	N	N	N
SPI Powernet	A+	N	Y	N	N	N	N	N	N	N
Citipower Trust	A-	N	N	Y	N	N	N	N	N	N
ETSA Utilities Finance Pty Ltd	A-	N	N	Y	N	N	N	N	N	N
Powercor Australia LLC	A-	N	N	Y	N	N	N	N	N	N
ElectraNet Pty Ltd	BBB+	N	Y	N	N	N	N	N	N	N
Sydney Water Corp	AAA	Y	N	N	N	N	N	N	N	N
Delta Electricity	AA-	Y	N	N	N	N	N	N	N	Y
Australian Gas Light Co.	A	N	N	Y	Y	Y	Y	Y	N	N
Origin Energy Ltd	A-	N	N	N	Y	Y	Y	N	N	Y
Snowy Hydro Ltd	BBB+	N	N	N	N	N	N	N	N	Y
Alinta Ltd	BBB	N	N	Y	Y	Y	Y	Y	N	Y
Edison Mission Energy Australia Ltd	BBB	N	N	N	N	N	N	N	N	Y
Envestra Ltd	BBB	N	N	N	N	N	Y	Y	N	N
GasNet Australia (Operations) Pty Ltd	BBB	N	N	N	N	N	N	N	Y	N
TXU Australia Holdings Ltd	BBB	N	N	Y	Y	Y	Y	Y	N	Y
United Energy Distribution Pty Ltd	BBB	N	N	Y	Y	N	N	N	N	N
Duke Energy Australia Pty Ltd	BBB-	N	N	N	N	N	N	N	Y	Y
Energy Partnership (Gas) Pty Ltd	BBB	No information found on the web								
Diversified Utility and Energy Trust	BBB-	Infrastructure investment vehicle								

Electric Trans	Transmit electricity from generator to distribution networks via high-voltage lines
Electric Dist	Distribute electricity from transmitters to retail/commercial points of sale
Electric Retail	Retailers are not necessarily distributors
Gas Dist	Distribute gas from high pressure pipelines to retail/commercial points of sale
Gas Dist Pipe Owner	Gas distributors are not necessarily the pipeline owners
High Pressure gas Trans	Transport gas from gas fields to gas distribution pipelines

6 TABLE II

[Confidential.]

APPENDIX 5B

Bruce D. Grundy

6.1.1 Curriculum Vita

6.1.2 December 2003

Ian Potter Centre of Financial Studies, Melbourne Business School
University of Melbourne
200 Leicester Street, Carlton Vic. Australia 3053
+61 (0) 3 9349 8167, Fax: +61 (0) 3 9349 8271
E-mail: b.grundy@mbs.edu

Education

PhD, Finance, Graduate School of Business, University of Chicago. 1992. Specialisations:

Finance and Economics. Beta Gamma Sigma. Dissertation: "Preferreds and Taxes."

Committee: Merton Miller (Chairman), George Constantinides, Douglas Diamond.

B. Com. Honours (1st Class), University of Queensland. 1978.

7 ACADEMIC POSITIONS

Ian Potter Professor, Melbourne Business School, 2000-.

Professor of Finance, University of Melbourne, 1998-1999.

Andrew Heyer Assistant Professor of Finance, The Wharton School, University of Pennsylvania, 1991-1998.

Assistant Professor of Finance, Graduate School of Business, Stanford University, 1985-1990.

8 PUBLICATIONS

"The Analysis of VaR, deltas, and state prices: A new approach," forthcoming in *European*

Finance Review. Co-author: Zvi Wiener.

"Stock market volatility in a heterogeneous information economy," 2002, *Journal of Financial and Quantitative Analysis* 37(1), 1-27. Co-author: Youngsoo Kim.

"Momentum: Fact or factor? Momentum investing when returns have a factor structure,"

2001, *Review of Financial Studies* 14(1), 29-78. Co-author: Spencer Martin.

"Merton H. Miller: His contribution to financial economics," 2001, *Journal of Finance* 56(4),

1183-1206.

"Generalised properties of option prices," 1996, *Journal of Finance* 51(5), 1573-1610. Co-

authors: Yaacov Bergman and Zvi-Wiener.

"Option prices and the underlying asset's return distribution," 1991, *Journal of Finance 46(3),*

1045-1070.

"Changing risk, changing risk premiums, and dividend yield effects," 1990, *Journal of Business*

63(1,Part 2), S51-S70. Co-authors: Nai-fu Chen and Robert F. Stambaugh.

"Optimal investment with stock repurchase and financing as signals," 1989, *Review of Financial Studies* 2(4), 445-465. Co-author: George Constantinides.

"Trade and the revelation of information through prices and direct disclosure," 1989, *Review*

of Financial Studies 2(4), 495-526. Co-author: Maureen McNichols.

Conference Proceedings

"Call and conversation of convertible corporate bonds: theory and evidence," 1986, *Proceedings: Seminar on the Analysis of Security Prices* 31, 35-70. Co-author: George Constaninides.

"The behavior of stock prices around ex-dividend dates," 1983, *Proceedings: Seminar on the*

Analysis of Security Prices 28, 83-114.

9 WORKING PAPERS

"Optimal exercise and valuation of real options: The effects of uncertainty and asymmetric information." Co-author: Johannes Raaballe. Under review at *Review of Financial Studies*.

10 PAPERS IN PREPARATION

"Human capital, financial capital and optimal corporate governance."

"Optimal fund size: The role of consultants and performance guarantees." Co-author, Simone Gervaise

11 EDITED VOLUMES

Selected Works of Merton Miller: A Celebration of Markets. Vol I Finance, 2002 (University of Chicago Press, Chicago, I11).

Selected Works of Merton Miller: A Celebration of Markets. Vol II Economics, 2002 (University of Chicago Press, Chicago, I11).

12 AWARDS

1998 Geewax-Terker Prize

1994-95 Batterymarch Fellow

1994 Hauck Teaching Award (Wharton)

1993 Outstanding Teaching Award (Wharton)

Professional Society Activities

Fellow: Australian Society of Certified Practicing Accountants.

Member: Australian Institute of Company Directors, Asian Finance Association, American Economics Association, American Finance Association, American Mathematical Society, European Finance Association, PRMIA , Western Finance Association.

Reviewer: Australian Accounting Research Foundation Proposed Exposure Draft on Director and Executive Disclosures.

Doctoral Colloquium Fellow: AFAANZ 2003 Colloquium

Australian Society of CPA's 1999 Research Lecture, University of Tasmania

Editor:

International Review of Finance, 2002-present

Associate Editor:

Journal of Finance, 2000-2003

Journal of Financial Research, 1999-present.

Accounting and Finance, 1999-2002.

Journal of Financial and Quantitative Analysis, 1992-1996.

Review of Financial Studies, 1988-1994.

Editorial Board:

Accounting and Finance, 2002-present

Ad Hoc Referee:

American Economic Review, Australian Journal of Management, Accounting and Finance, European Economic Review, European Journal of Finance, Financial Management, Financial Review, Journal of Accounting Research, Journal of Business, Journal of Business and Economic Statistics, Journal of Finance, Journal of Financial Economics, Journal of Financial Intermediation, Journal of Political Economy, Journal of Public Economics, Management Science, Mathematical Finance, Review of Quantitative Finance and Accounting, Quarterly Journal of Economics.

Program Committee:

American Finance Association Meetings: 2001.

Asian Finance Association Meetings: 2004

European Finance Association Meetings: 2000, 2001 and 2002.

Journal of Accounting Research Annual Conference: 2002.

European Financial Management Association Meetings: 1999.

American Economics Association Meetings: 1998.

Western Finance Association Meetings: 1990, 1991, 1994, 1995, 1997 and 1998.

Indiana University Symposium on Design of Securities and Markets: 1993.

Reviewer:

Research Grants Council of Hong Kong: 1997, 2000 and 2004.

National Science Foundation Proposals: 1990, 1991, 1994 and 1997.

Australian Research Council: 1994 and 1995.

Social Sciences and Humanities Research Council of Canada: 1993 and 1994.

Discussant:

American Finance Association Meetings: 1986, 1987, 1988, 1989, 1990, 1994 and 1995.

Annual Conference on Financial Economics and Accounting: 1992 and 1996.

Asia-Pacific Finance Association Meetings: 1999

European Finance Association Meetings: 2002.

Fifth Annual Texas Finance Festival: 2003

Ph.D. Conference in Economics and Business: 1999.

Simulation Based & Finite Sample Inference in Finance Conference: 2003

Western Finance Association Meetings: 1993 and 1997.

Session Chair:

Accounting & Finance Association of Australia and New Zealand Meetings: 2003.

Australasian Finance & Banking Conference 2003

American Finance Association Meetings: 2001.

European Finance Association Meetings: 2002.

Western Finance Association Meetings: 1995.

Keynote Speaker:

Accounting & Finance Association of Australia and New Zealand Meetings: 2003.

Australasian Banking & Finance Conference: 2002.

Organiser:

The Dollars and Sense of Bank Consolidation: MBS Conference 2002.

Risk Management and Pricing for Financial Institutions: Lessons from the Closed-End Fund Industry: Wharton Financial Institutions Center Conference 1995.

Panelist:

Tax Issues in Capital Structure and Dividends. Uni. of Chicago, GSB Conference 1994.

Conference Presentations:

AGSM Finance and Accounting Camp: 1996, 1997 and 1999.

Berkeley Program in Finance: 1998.

American Finance Association Meetings: 1986, 1989, 1990, 1996, 1997 and 1998.

Annual Conference in Financial Economics and Accounting: 1995 and 1996.

American Mathematical Society Meetings: 1996.

European Finance Association Meetings: 1995.

NBER Financial Risk Assessment and Management Conference: 1995.

N.J.C.R.F.S. Conference in Security Design and Innovations in Financing: 1993.

Western Finance Association Meetings: 1984, 1989 and 1993.

Sixth Annual Conference MSMESB: 1991.

Australasian Banking and Finance Conference: 1989.

NBER Summer Institute: 1998.

Finance Seminar Presentations:

Aarhus, Alberta, Australian Graduate School of Management, Australian National University, Bond University, Boston College, Carnegie-Mellon, Central Queensland University, Chicago, Columbia, Commodity Futures Trading Commission, Cornell, Dartmouth, Duke, Fields Institute, Frankfurt am Main, Hong Kong University of Science and Technology, Houston, Humboldt, Insead, London Business School, London School of Economics, Macquarie, Maryland, Melbourne Business School, Michigan, Minnesota, MIT, Monash, Monash-Mt Eliza, National University of Singapore, New York University, Northwestern, Odense, Ohio State University, Oregon, Queens, Rutgers, Stanford, University of Adelaide, University of British Columbia, University of California Berkley, University of California Irvine, University of California Los Angeles, University of Illinois Champaign, University of Melbourne, University of New South Wales, University of North Carolina Chapel Hill, University of Queensland, University of Sydney, University of Technology Sydney, University of Western Australia, Vanderbilt, Washington University, Yale.

Teaching Experience

Derivatives-related courses: Undergraduate, Masters and PhD courses on options, futures, swaps, mortgage backed securities and exotics.

Corporate Finance-related courses: Honours, Masters and PhD courses on capital budgeting, mergers and acquisitions, corporate taxation, agency problems, information asymmetries, and security design.

Corpoprate Governance: MBA course

Real Options and Resource Projects: MBA course

Financial Management: EMBA course

Executive Education:

ABN Amro

Australian Graduate School of Management

KPMG

Liechtenstein Global Trust

Melbourne Business School

PaperLinx

Susquehanna Investment Group

Telstra Risk Management and Assurance

Turkish Capital Markets Board

Wharton School Pension Funds and Money Management Program

Member of Thesis Committees.

Completed: Ken Bechmann (Copenhagen Business School), Jacob Boudoukh (New York University), Jennifer Carpenter (New York University), Adam Dunsby (Goldman Sachs), Michael Gallmeyer (Carnegie-Mellon), Pekka Heitala (Insead), Terry Hildebrand (Enron), Ron Kaniel (University of Texas), Youngsoo Kim (Alberta), Michele Kreisler (Morgan Stanley), Guan Hua Lim (University of

Singapore), Spencer Martin (Ohio State) Ed Nelling (Georgia State), Rob Reider (J.P Morgan), Mark Vargus (University of Michigan).

In Progress: Krishnan Maheswaran, Ian O'Connor.

External Examiner: Aarhus University, University of Technology Sydney.

Visiting Positions:

Visiting Professor, Maquarie University 1994.

Metzler Bank Professor, Johann Wolfgang Goethe-Universität Frankfurt am Main 1998.

Visiting Professor, University of Chicago, Winter-Spring 2003.

Administrative Positions

Melbourne Business School:

Director's Advisory Committee, 2001-present.

Melbourne Business School Committee, 2001-2003.

Academic Planning and Development Committee, 2002-present.

Curriculum Committee, 2002-present.

University of Melbourne:

Accounting and Finance Departmental Committee, 1999.

Faculty of Economics and Commerce Research Committee, 1999.

The Wharton School:

Convenor Corporate Finance Workshop, 1995-1997.

Selection Committee, Wharton Fellows Fund, 1993-1997.

Wharton Finance Faculty Recruiting Committee, 1995-1996.

Convenor Finance Seminar Series, 1992-1994.

Stanford Graduate School of Business:

Convenor Finance Seminar Series, 1988-1990.

Deans Advisory Committee, 1986-1988.