



Corporate Interest Rate Risk Management with Derivatives in Australia

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Joint paper with Prof. Michael Sherris, UNSW.



Introduction

- Corporate interest rate risk hedging in Australia
- Corporate Demand for hedging
- Australian data
- Results from the study
- Summary



Corporate Interest Rate Risk Hedging in Australia

- Survey by Benson and Oliver (2004)
 - 76% of the respondents use derivatives
 - 63% hedge interest rate risk with derivatives
 - 58% hedge FX risk with derivatives
 - 29% hedge commodity price risk with derivatives
- Essential information available in annual reports (Australian Accounting Standard 33 AAS 33, Dec 1996)

Corporate Demand for Hedging

- Theory underlying risk and capital management motivating the corporate demand for hedging:
 - Taxes
 - Financial distress and insolvency
 - Agency costs
 - Economies of scale
 - Shareholder's value creation



Corporate Demand for Hedging

- Hypothesis 1 (H1):
 - Companies with larger amounts of tax loss carry-forwards hedge more
 - These tax credits can only be used if companies have a sufficiently large pre-tax income
 - Companies hedge to increase the likelihood of using deductions from tax credits
- Proxy for H1:
 - Future tax benefits scaled by assets (+ive)

Corporate Demand for Hedging

- Hypothesis 2 (H2):
 - Companies with larger expected costs of financial distress hedge more
- Proxies for H2:
 - Leverage (Total liabilities/Total assets) (+ive)
 - Floating IR rate debt / Total debt (+ive)
 - Earnings per share (EPS) (+ive)
 - Current ratio (Curr. assets/Curr. liab.) (-ive)
 - Free cash flow (scaled by asset value) (-ive)
 - Financial assets / financial liabilities (-ive)



Corporate Demand for Hedging

- Hypothesis 3 (H3):
 - Leveraged companies with larger growth opportunities are more exposed to the underinvestment problem and hence hedge more
- Proxy for H3:
 - Research and development expenditure (R&D) scaled by total assets (+ive)



Corporate Demand for Hedging

- Hypothesis 4 (H4):
 - Company size has an effect on corporate hedging demand, but the sign of the effect is ambiguous a priori
- Proxy for H4:
 - Natural logarithm of company's total book asset value (+ive)

Corporate Demand for Hedging

- Hypothesis 5 (H5):
 - Hedging increases the value of the firm through reduction in taxes, expected costs of financial distress and agency costs
- Proxy for H5:
 - Annual log return in share price (+ive)



Australian Data

- Accounting standards in force since 1997 (AAS 33) require Australian companies to provide detailed information on interest rate risk exposures:
 - Value of liabilities indexed to floating interest rate
 - Value of liabilities indexed to fixed interest rate
 - Notional value of derivatives used to switch from floating to fixed interest rate
 - Notional value of a derivative is shown together with the respective hedged item

Australian Data

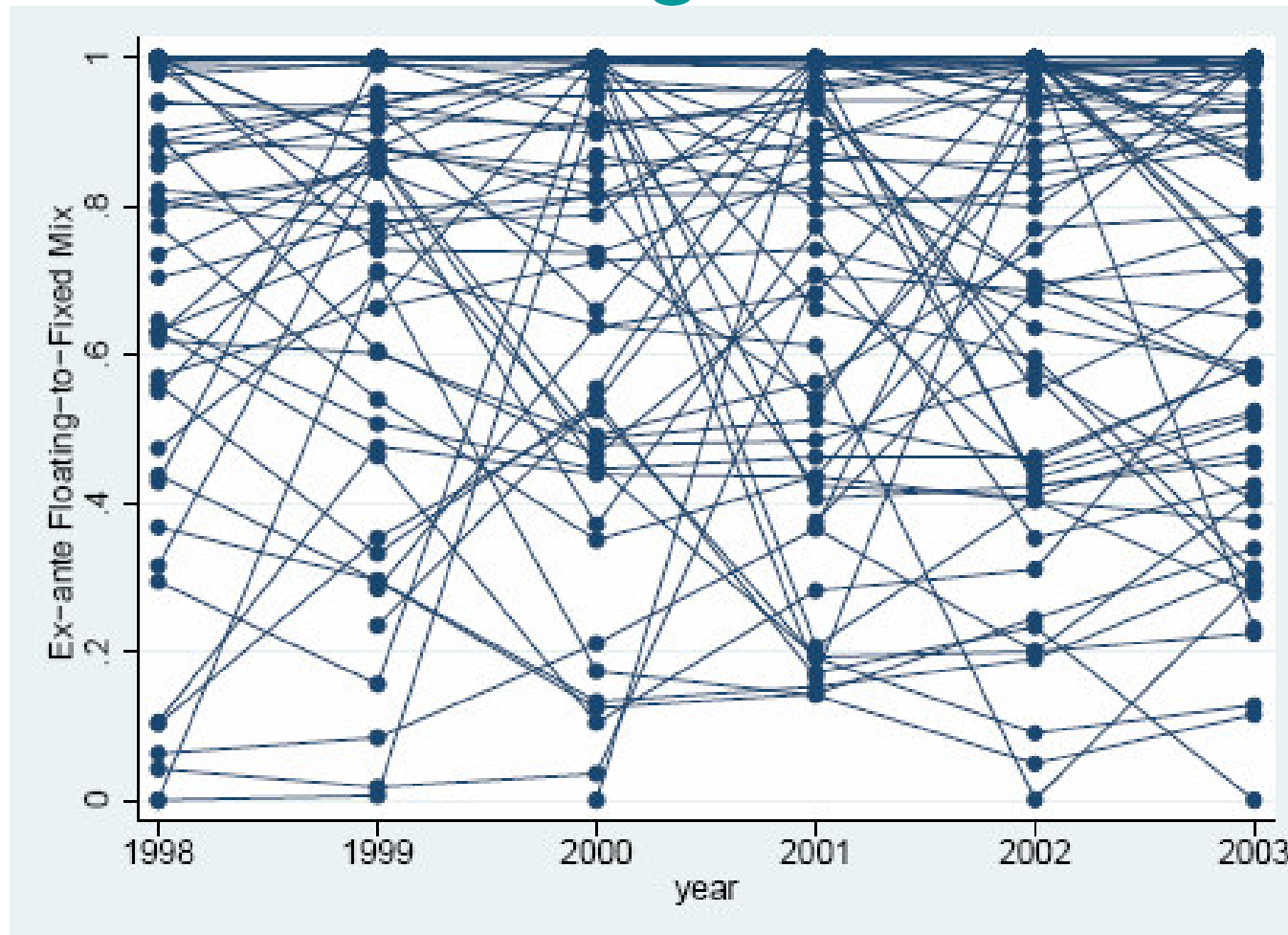
- American data from the 1990s has limitations:
 - Graham and Rogers (2002):
“Current financial reporting guidelines do not require firms to disclose the underlying asset and/or liability that is being hedged with a derivative contract”

Australian Data

- The extent of hedging can be measured with
$$\frac{\text{Notional Value of Derivatives}}{\text{Interest Rate Bearing Liabilities}}$$
- As opposed to previous studies
$$\frac{\text{Notional Value of Derivatives}}{\text{Total Asset Value}}$$
- It is also possible to measure the floating-to-fixed mix

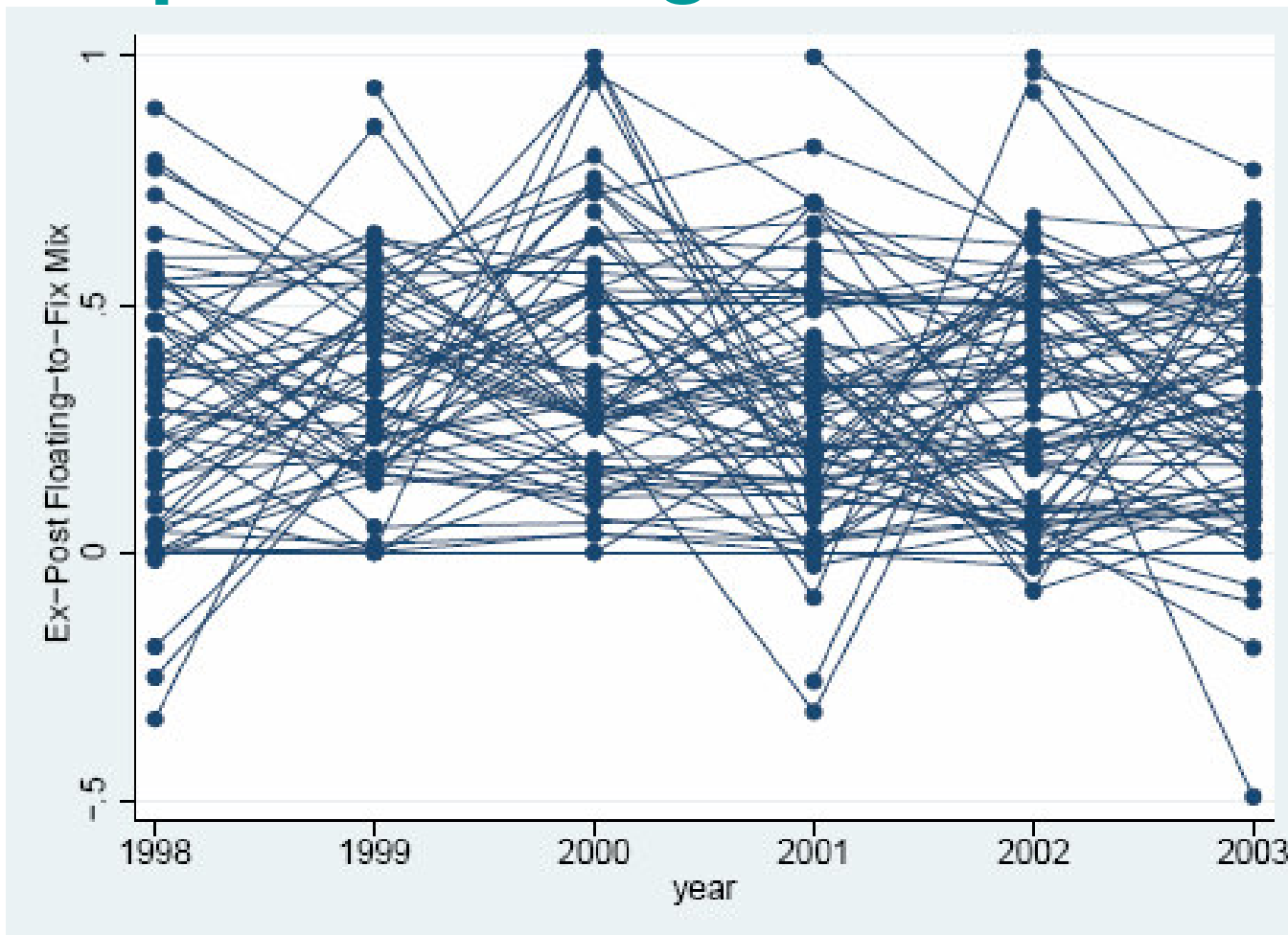


Australian Data: Ex-ante Floating-to-Fixed Mix





Australian Data: Ex-post Floating-to-Fixed Mix





Australian Data

- Hints given by the previous graphs:
 - 1) Companies use interest rate derivatives to maintain their target floating-to-fixed mix
 - 2) The ex-ante floating-to-fixed mix should be an important variable to explain the demand for hedging with interest rate derivatives



Australian Data

- Two Panel Data Sets – 1998 to 2003.
 - **First Data Set (Decision to use to hedge derivatives)**
 - Binary dependent var.: 1 for hedger, 0 for non-hedger
 - 189 companies (banks excluded)
 - 108 hedgers (57%) and 81 non-hedgers
 - 1102 observations
 - **Second Data Set (Extent of hedging)**
 - Continuous dependent var.: extent of hedging
 - 78 companies
 - 465 observations

Australian Data

- Allowed for
 - Year Dummy Variables
 - Dummy variable for type of industry:
 - Utility companies
 - Non-banking financial companies
 - Property trusts
- Diagnostic tests:
 - error structure presents group-wise heteroskedasticity, contemporaneous correlation and serial correlation (OLS with PCSEs is used)



Results from the Probit Regression

Regressor	Probit Estimate	(p-value)
Constant	-22.045	(0.000)
Ln Assets	1.1236	(0.000)
Leverage	0.8699	(0.089)
Ln Returns	0.0059	(0.980)
Future Tax Benefit	-3.0902	(0.683)
R&D	-0.0531	(0.648)
CurrentRatio	-0.0224	(0.448)
Free Cash Flow	0.2741	(0.747)
EPS	0.0032	(0.382)

Results for the Extent of Hedge

Regressor	Dependent Variable: Notional Value/ Assets		Dependent Variable: Hedge Ratio	
	Estimates	p-value	Estimates	p-value
Constant	0.0684	(0.462)	0.7963	(0.003)
Ln Assets	-0.0080	(0.055)	-0.0367	(0.003)
Leverage	0.2885	(0.000)	-0.0956	(0.310)
Financial Ratio	0.0015	(0.142)	-0.0002	(0.859)
Float Ratio	0.1192	(0.000)	0.5276	(0.000)
Ln Returns	0.0147	(0.042)	0.0353	(0.066)
Future Tax Benefits	-0.2342	(0.436)	1.8427	(0.044)
Dummy Utilities	0.1390	(0.000)	0.2200	(0.000)
Dummy Financial	-0.0247	(0.109)	0.1020	(0.046)
Dummy Prop. Trusts	0.0651	(0.000)	0.1567	(0.002)

Results for the Extent of Hedge

- Non-significant results for:
 - R&D
 - Current Ratio
 - Free Cash Flow
 - EPS

(Please, refer to models 3 to 6 in our paper)

 - Year Dummies



Summary of Results

- Decision to hedge
 - **Company size** and **leverage** are both have a significant positive relation with the decision to hedge with interest rate derivatives
- Extent of hedging
 - Different results when the **Hedge Ratio** is used as the dependent variable;
 - **Leverage** is no longer significant and the estimated coefficient is almost zero



Summary of Results (Cont.)

- Extent of hedging (Cont.)
 - **Company size** has a small negative impact on the extent of hedging
 - Significant +ive relation with **Ln Returns (3.5%)**
 - The **Float Ratio** and the **Future Tax Benefit** are the most relevant explanatory variables to the extent of hedging
 - Companies from the **utilities**, (non-banking) **financial** and **property trust** industries hedge more than companies in other industries.



Summary

- Study confirms the important role of interest rate derivatives in Australian companies
- Importance of the measurement of risk exposures being hedged
- Quality of Australian data contributed to the robustness of results
- Future studies will benefit from hedging reporting required by the IFRS



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