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Abstract

We explore the relationship between the type of derivative instrument used and firm value, in a sample of Australian firms. Specifically, we examine the impact of the corporate use of swaps, futures, forwards and options, and the extent of such usage, on firm value. Our findings suggest that a 'discount' is most severely imposed on users of swaps.

1. Introduction

In one of the pioneer papers that address the relationship between corporate risk management via the use of financial derivatives and firm value, Allayannis and Weston (2001) report that the corporate use of foreign currency derivatives by US (non-financial) firms has a positive impact on firm value. They documented a hedging premium of 4.87% of firm value for firms with positive foreign sales. More recently, Carter, Rogers and Simkins (2006) support the finding of Allayannis and Weston (2001) and report a hedging premium of 14% associated with fuel hedging in the airline industry. However, Lookman (2004) and Jin and Jorion (2006) examine the risk management practices of U.S. oil and gas producers and fail to find a significant relationship between commodity derivatives and firm value. Accordingly, in this paper we extend the literature by testing the hypothesis of whether the use of specific financial derivative instruments is rewarded by a higher market value. Specifically, we examine the impact of the corporate use of swaps, futures, forwards and options, and the extent of such usage, on firm value as measured by Tobin's Q for a sample of Australian publicly listed companies over the period of 1999–2000. In direct contrast to the prediction that the use of derivatives is associated with a 'hedging premium', our findings suggest that if anything financial markets that are more prone to information asymmetry impose a 'discount' on derivative users – notably, the users of swaps.

2. Research Framework

2.1 Data

We use the Connect4 database that contain data of publicly listed Australian firms on the ASX to obtain our sample of non-financial firms. Based on the Notes to Financial Statements of each individual firm, we classify a company as either a derivative user or non-user. Specifically, a company is identified as a derivative user if it reports the use of options, swaps and futures/forwards. For every derivative user, the notional value of derivative contracts is

used to proxy how active that user is in that derivative instrument. The sample obtained from Connect4 was then compared with the Datastream database to obtain data on the market value of equity. Our final sample consists of 428 firm/year observations, of which 217 observations relate to 1999 and the remainder to 2000. As revealed in Table 1, our sample is unevenly distributed across 23 industries, most heavily represented by the Property Trusts (47 observations), Miscellaneous Industrials (50 observations) and, as expected from an Australian sample, Gold (35 observations) industries.

2.2 Variables

We use a simple type of TobinQ calculated as the sum of total liabilities and market value of equity divided by total book assets as our dependent variable. Table 1 further reveals that, specific to our sample, firms belonging to the Healthcare and Biological Index industry have the highest average TobinQ (2.53). At the other end of the spectrum, firms in the Engineering sector score the lowest average TobinQ (1.07).

Our independent variables are measures of whether a firm uses a specific financial derivative instrument or not and in the case of a user, the extent to which that instrument is used. To proxy for the incidence of derivative usage, we use a dummy variable which equals unity if a firm uses a particular form of financial derivative and zero otherwise: (a) FUFO – futures and/or forwards; (b) OP - options; (c) SW - swaps. The extent of usage is calculated as the total notional value of derivative contracts for the given instrument, scaled by firm size where firm size is defined as total book assets: (a) ExtentFUFO – futures and/or forwards; (b) ExtentOP - options; (c) ExtentSW - swaps.

To identify the impact of financial derivatives on firm value, we consider a number of factors that have been documented in the literature. These control variables are (a) firm size (eg Daines, 2001; Carter, Simkins and Simpson, 2003) – proxied by the log of total assets; (b) Leverage (eg Titman and Wessels, 1988; Rees, 1997) – proxied by the ratio of long term debt

to total assets; (c) Liquidity – proxied by the ratio of corporate cash and cash equivalents holding to total assets; (d) Profitability (eg Rees, 1997 and Hand and Landsman, 2005) – proxied by the ratio of net profit after tax and before abnormal items to total assets, ROA; (e) Growth (eg Sougiannis, 1994; Green, Stark and Thomas, 1996) – proxied by capital expenditure scaled by total assets; (f) Industrial Diversification – proxied by an 'industry segment' variable, the number of industrial segments in which the firm operates; (g) Geographical Diversification (eg Carter, Panzalis and Simkins, 2001) – proxied by the ratio of foreign sales to total sales (FSTS); (h) Managerial Ownership – proxied by the percentage of shares held by directors and executive officers.

3. Findings

We aim to ascertain if the use of one type of derivative instrument is more value inhibiting than another. To achieve this objective, we classify our sample into futures and forwards users (FUFO), option users (OP) and swap users (SW). These analyses are motivated by the belief that derivatives with symmetrical payoffs are potentially more value hurting than derivatives with asymmetrical payoffs, assuming constant costs of hedging.

Panel A of Table 2 reports the results of regressions that differentiate the use of financial derivatives along these dimensions.[1] The major result observed is that the market apparently imposes a hedging discount on swap users. Moreover, the magnitude of the hedging discount is striking. Specifically, the incidence of swap usage is associated with a reduction in firm value of around 0.36. Given that the average TobinQ of the sample is 1.51, the hedging discount associated with the use of swaps represents a 24% reduction in firm value. Additionally, the more extensively firms make use of swap instruments, the lower the

[1] The results for the control variables are suppressed to conserve space.

firm value. Although futures/forwards also provide symmetrical payoffs, the use of these instruments does not appear to induce a 'hedging discount'.

In Panels B and C of Table 2, we go one step further by considering the two dimensional interaction between the type of derivative instruments and the underlying exposure. As such, we develop nine new independent variables and examine the impact of each of these variables on firm value.[2] The results that we obtain are largely consistent with those reported in Panel A. The choice of the type of derivative instrument does impact firm value – swap contracts tend to impair firm value.

While derivative usage in general can potentially be a source of information asymmetry that explains a hedging discount, market participants may discount the use of swaps more heavily due to the possibly higher default risk associating with swap contracts. Despite the fact that default risk is inherent for all derivative contracts, in the case of exchange traded futures and options, the risk is mitigated through daily marking to market processes by an organized exchanged. In contrast, the swap market, like all other over the counter derivative markets, does not have such a systematic approach to control default risk but primarily rely on credit enhancement devices to control for default risk. Our results, therefore, suggest that market participants may price default risks associating with swap contracts into the valuation of a firm.

5. Conclusion

We extend the literature by testing the hypothesis of whether the use of specific financial derivative instruments is rewarded by a higher market value. Specifically, we examine the impact of the corporate use of swaps, futures, forwards and options, and the extent of such usage, on firm value for a sample of Australian publicly listed companies. In direct contrast to

[2] They are: FUFO_FCD, FUFO_IRD, FUFO_COM, OP_FCD, OP_IRD, OP_COM, SW_FCD, SW_IRD and SW_COM.

the prediction that the use of derivatives is associated with a ‘hedging premium’, our findings suggest that a ‘discount’ is imposed on derivative users. This discount is most strongly related to the use of swaps, while there is little evidence indicating that the use of options is harmful to value.

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Table 1
Industry Classification

Industry	*Number of Observations*	*Mean Tobin Q*	*Median Tobin Q*
Gold	35	1.2735	1.1486
Other Metals	19	1.2545	1.1951
Diversified Resources	5	1.4293	1.3126
Energy	27	1.5888	1.1601
Infrastructure and Utilities	17	1.4193	1.1711
Developers and Contractors	15	1.4502	1.1703
Building Materials	15	1.1353	1.0460
Alcohol and Tobacco	9	2.4296	2.2706
Food and Household Goods	12	1.1872	1.1408
Chemicals	5	1.1854	1.1861
Engineering	7	1.0735	1.0124
Paper and Packaging	8	1.3625	1.2409
Retail	29	1.8085	1.5238
Transport	8	1.8204	1.3727
Media	24	1.6271	1.3907
Banks	0	NA	NA
Insurance	4	1.7081	1.0875
Telecommunications	21	2.3358	1.9528
Investment and Financial Services	29	1.3570	1.0506
Property Trusts	47	1.1102	1.0108
Healthcare and Biological	17	2.5302	2.0802
Miscellaneous Industrials	42	1.5346	1.2855
Diversified Industrials	22	1.2630	1.1783
Tourism and Leisure	11	1.5570	1.2355
Total	428	1.5133	1.1904

Table 2
Type of Derivative Instrument Used and Firm Value

	Predicted Sign	Tobin Q	t-stat	R-squared
Panel A: Futures/Forwards; Options; Swaps				
FUFO	+	-0.1012	-1.2035	0.4048
OP	+	-0.0299	-0.4333	0.4019
SW	+	-0.3633[a]	-4.3576	0.4343
ExtentFUFO	+	-0.0012	-0.7645	0.4020
ExtentOP	+	0.0004	0.2004	0.4017
ExtentSW	+	-0.0086[b]	-2.4556	0.4088
Panel B: An Interactive Model of Derivative Usage				
		Tobin Q	t-stat	R-squared
FUFO_FCD	+	-0.0360	0.0795	0.4021
FUFO_IRD	+	-0.2179	-0.9838	0.4023
FUFO_COM	+	-0.0718	-0.9763	0.4026
OP_FCD	+	-0.0257	-0.2934	0.4018
OP_IRD	+	0.1962	1.3189	0.4039
OP_COM	+	0.0449	0.5613	0.4020
SW_FCD	+	-0.0360	-0.2761	0.4018
SW_IRD	+	-0.3117[a]	-3.8557	0.4272
SW_COM	+	-0.1860	-1.4760	0.4044
Panel C: An Interactive Model of the Extent of Derivative Use				
		Tobin Q	t-stat	R-squared
FUFO_FCD	+	-0.0003	-0.2417	0.4017
FUFO_IRD	+	-0.0794	-1.8452	0.4025
FUFO_COM	+	-0.0004	-1.4453	0.4028
OP_FCD	+	-0.0002	-0.2470	0.4017
OP_IRD	+	0.0034	0.4363	0.4019
OP_COM	+	-0.3866	-0.3009	0.4018
SW_FCD	+	-0.0050[c]	-1.7058	0.4029
SW_IRD	+	-0.0070[a]	-3.2036	0.4104
SW_COM	+	-0.0031[b]	-2.4987	0.4040

[a] significant at 1% level
[b] significant at 5% level
[c] significant at 10% level