

# M&A Accounting and the Diversification Discount

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# Motivation - The Diversification Discount

- Most corporate diversification studies find that conglomerates are valued less than industry-matched portfolios of focused firms.
- Different strands of research tried to explain the diversification discount:
  - Agency costs (Jensen 1986);
  - Inefficient internal capital markets (Scharfstein and Stein (2000) and Rajan, Servaes and Zingales (2000));
  - Endogeneity/self-selection of the decision to diversify (Villalonga (2004a), Campa and Kedia (2002), Maksimovic and Phillips (2002), Graham, Lemmon and Wolf (2002));
  - Biases caused by data/measurement (Villalonga (2004b)).

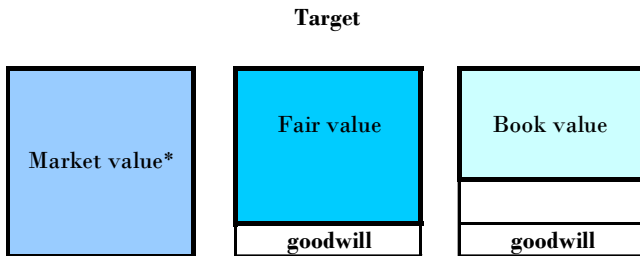
# Motivation - Contribution

- $q$ -based measures of the diversification discount are biased upward by M&A activity and its accounting implications:
  - Purchase accounting reports acquired assets at transaction value
  - Transaction value typically exceeds pre-merger book value
  - Thus, the  $q$  of the merged firm tends to be lower than that of a portfolio that combines both pre-merger entities
  - Conglomerates are more acquisitive, therefore their  $q$  tends to be lower
- This bias explains a sizeable part of diversification discount;
  - Correcting  $q$  for goodwill reduces the diversification discount (between 30% and 76%)

# M&A Accounting

After 2001 firms can only use the purchase:

- **Purchase Method** - target's net assets are reported at fair value, any premium paid in excess is capitalized as goodwill.



\* transaction value

# Purchase accounting, $q$ and excess value

## Acquirer A buys target T to form firm AT:

Under the purchase method the combined firm  $q$  is:

$$q_{AT}^{Purchase} = \frac{M_A + M_T - c(M_T + P) + S}{B_A + (M_T + P)(1 - c)}$$

Where:

$M_i$  - market value of firm  $i$

$B_i$  - book value of firm  $i$

$P$  - premium paid above (below)  $M_i$

$S$  - synergies

$c$  - proportion of  $(M_i + P)$  financed with internal funds

# Deal Excess-value

**Definition:**  $EV = q_{AT} - \frac{M_A + M_T}{B_A + B_T}$

*Under the purchase method, deal excess-value is:*

$$EV \equiv \frac{M_A + M_T + S - c(M_T + P)}{B_A + (1 - c)(M_T + P)} - \frac{M_A + M_T}{B_A + B_T}$$

- Assuming  $c = 0$  (no internal financing), excess value simplifies to:

$$EV = \frac{M_A + M_T + S}{B_A + M_T + P} - \frac{M_A + M_T}{B_A + B_T}$$

- In this case **excess value is negative** as long as  $q_A > 1$ ,  $q_T > 1$  and  $P > S$ .*
  - $q_A > 1$ ,  $q_T > 1$  holds for 93% of the deals in my sample
  - $P > S$  is very likely to be satisfied in practice as the negative acquirer returns documented in the M&A literature suggest that acquirers tend to overpay for synergies.
- For the median acquirer ( $q_A=2.42$ ) buying a target with  $q$  above the sample median ( $q_A > 2.14$ ), deal excess value is negative as long as the premium represents at least 7% of the synergies.

# A Simple Example...

A buys T at its market valuation. There are no synergies. Under the purchase method:

	<b>Firm A</b>	<b>Firm T</b>	<b>Firm AT</b>
Book value of assets	100	100	250
Market value of assets	150	150	300
<i>q</i>	1.5	1.5	1.2

The *q* drops to 1.2 after the acquisition. Excess value (1.2-1.5) is negative, even though synergies are zero !

One needs to adjust for the difference between the transaction price and target's BV, to get unbiased excess value:

$$q_{adjusted} = \frac{150+150}{250-(150-100)} = 1.5$$



# Data

- Deals data from SDC platinum - The impact of M&A accounting on  $q$  and deal excess value;
- Firm and segments data from Compustat and Compustat Segments from 1988 to 2007 - The impact of M&A accounting on the diversification discount;
- Excluding:
  - Firms with segments in the financial sector, agriculture, government and other non-economic activities;
  - Firms for which the sum of business segments sales/assets deviate from the firm's total sales/assets by more than 5%.

# Diversification Discount - Typical empirical test:

- Estimate firm excess value:
  - *Firm Excess Value* =  $q$  – imputed  $q$ , where:
    - *imputed*  $q = \sum w_i \times \text{Hypothetical } q_i$
    - $w_i$  - business segment's assets (or sales) weight
    - *Hypothetical*  $q_i$  – median (average)  $q$  of standalones in the same industry of the business segment  $i$
- Regress firm excess-value on a diversification measure (diversification dummy):
  - $EV_{it} = \beta_0 + \beta_1 dDIV_{it} + \beta_2 X_{it} + \varepsilon_{it}$

# Diversification Discount

Conglomerates' excess-value might have a downward bias, because of the impact of M&A accounting:

$$EV_{it}^{Adjusted} = \beta_0^A + \beta_1^A dDIV_{it} + \beta_2^A X_{it} + \varepsilon_{it}^A$$

**The average diversification discount should be lower once  $q$  is corrected for goodwill ( $\beta_1^A < \beta_1$ ).**

# Deal-excess-value

## Summary statistics of deals

	Mean	Median	Std. Dev.	Min	Max	N
<i>Panel A - Acquisitions</i>						
Pre-deal $q$ - Acquirer	2.42	1.83	1.77	0.79	15.98	3,363
Post-deal $q$ - Acquirer	2.13	1.65	1.41	0.81	10.45	3,363
Deal Excess value	-0.27	-0.11	1.08	-12.93	6.59	3,363
$q$ - Target	3.46	2.14	4.28	0.65	43.47	3,363
Total assets - Target (\$MM)	513.00	74.90	2,079.08	0.06	56,553.00	3,363
Net assets - Target (\$MM)	193.10	32.15	838.49	-994.19	23,534.00	3,363
Total Equity Mkt Value - Target (\$MM)	773.70	119.60	3,439.97	0.05	89,165.59	3,363
Transaction Value (\$MM)	781.23	112.38	3,512.57	0.05	89,167.72	3,363
Price-to-book difference (\$MM) (Mv - Bv)	608.76	72.97	2,948.59	-496.48	84,069.42	3,363
Transaction premium (\$MM)	66.76	0.00	384.86	-3,188.50	9,999.97	3,363
External financing dummy	0.80	1.00	0.40	0	1	2,525
<i>Panel B - Purchase deals</i>						
Pre-deal $q$ - Acquirer	2.25	1.74	1.57	0.79	15.98	2,879
Post-deal $q$ - Acquirer	1.95	1.56	1.18	0.81	10.31	2,879
Deal Excess value	-0.29	-0.12	1.02	-12.93	5.37	2,879

# Deal excess value

- The post-merger  $q$  tends to be lower than pre-merger  $q$
- Deal excess value is negative on average: post-merger  $q$  is lower than the  $q$  of a portfolio combining the two pre-merger firms as standalones.
- At the same time, there is on average a positive premium paid above market value of target.

# Firm-excess-value - adjusting for goodwill

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Excess value (assets weight)				Excess value (sales weight)			
Goodwill correction	No	Yes	No	Yes	No	Yes	No	Yes
	<i>Panel A: Industry median</i>							
Div. dummy	-0.100*** [-10.942]	-0.072*** [-7.504]	-0.022** [-2.116]	-0.006 [-0.563]	-0.103*** [-11.380]	-0.075*** [-7.914]	-0.021** [-2.012]	-0.005 [-0.498]
Log assets	0.007*** [2.655]	0.011*** [4.374]	-0.115*** [-20.105]	-0.101*** [-16.845]	0.006** [2.477]	0.011*** [4.161]	-0.115*** [-20.321]	-0.101*** [-17.052]
Ebit-to-sales	0.414*** [18.786]	0.434*** [19.685]	0.665*** [25.343]	0.671*** [25.434]	0.412*** [18.690]	0.431*** [19.578]	0.663*** [25.269]	0.669*** [25.358]
Capex-to-sales	0.073*** [3.632]	0.019 [0.927]	0.305*** [11.842]	0.289*** [11.160]	0.075*** [3.697]	0.020 [0.999]	0.307*** [11.915]	0.291*** [11.205]
Observations	59,056	59,047	59,056	59,056	59,090	59,094	59,090	59,090
R-squared	0.037	0.037	0.037	0.090	0.037	0.037	0.037	0.091

# Excess value adjusted for goodwill

- Adjusting excess value for  $q$  reduces the diversification discount by 30% in the OLS specification
- Adjusting excess value for  $q$  reduces the diversification discount by 70% in the firm fixed effects specification
- In some of the firm-fixed effects specifications adjusted for goodwill the diversification discount is not significant any more!
- These results suggest that M&A accounting explains at least partially the diversification discount

# Firm-excess-value - other diversification measures

	(1)	(2)	(3)	(4)
	Excess value (industry median)			
Goodwill correction	No	Yes	No	Yes
Unrelated div. dummy	-0.069*** [-6.674]	-0.047*** [-4.254]	0.015 [1.261]	0.025** [2.048]
Number of segments	-0.037*** [-10.409]	-0.026*** [-7.033]	-0.007* [-1.710]	-0.000 [-0.050]
N. of unrelated segments	-0.038*** [-5.615]	-0.026*** [-3.714]	0.010 [1.345]	0.017** [2.151]
Herfindahl index	-0.192*** [-10.680]	-0.135*** [-7.057]	-0.052** [-2.447]	-0.016 [-0.696]
Total entropy	-0.350*** [-10.793]	-0.247*** [-7.136]	-0.097** [-2.515]	-0.032 [-0.797]
Unrelated entropy	-0.252*** [-5.901]	-0.154*** [-3.250]	0.055 [1.038]	0.113** [2.108]
Firm fixed effects	No	No	Yes	Yes

- Previous results are robust to using alternative measures of firm diversification



# Firm-excess-value - using market-to-sales

	(1)	(2)	(3)	(4)
	Excess value (assets weight)		Excess value (sales weight)	
<i>Panel A: Industry median</i>				
Div. dummy	-0.208*** [-14.799]	-0.121*** [-6.961]	-0.195*** [-14.074]	-0.103*** [-5.960]
Log assets	0.083*** [22.953]	0.097*** [11.448]	0.092*** [24.697]	0.099*** [11.399]
Ebit-to-sales	0.108*** [3.129]	0.349*** [9.572]	-0.029 [-0.765]	0.264*** [6.505]
Capex-to-sales	0.648*** [19.430]	0.909*** [22.180]	0.740*** [20.529]	0.988*** [21.810]
Observations	59,047	59,047	59,094	59,094
R-squared	0.092	0.697	0.097	0.694

- Market-to-sales should not be affected by M&A accounting: I still find a significant diversification discount using market-to-sales.

# Conclusion

- M&A accounting generates a mechanical negative excess value for a significant proportion of deals (more than 50%);
- Correcting  $q$  for goodwill decreases the diversification discount by 30% (this is a conservative adjustment), and up to 76%;
- This is consistent with  $q$ -based measures of the diversification discount being biased upward by M&A activity and its accounting implications
- Evidence of the diversification discount persists when market-to-sales is used (market-to-sales is not affected by these M&A accounting effects)
- The differences between the  $q$  and the market-to-sales estimate of the discount remain to be explained
- These results cast serious doubt on these widely used methods.