FIE401 - First assignment
M&A and Method of Payment

Group 8

2022-09-21

Abstract

In this report we intend to answer the research question: "Do mergers destroy value for bidder shareholders depending on the method of payment?" We have used the provided file "CAR_M&A.Rdata" which contains 5154 deals over a period from 1990 to 2014 to investigate the impact of payment method. Our findings on this topic are that when a bidding company fully uses stocks as currency for acquisitions it receives a negative announcement effect on the wealth if the target company is a public company. In contrast, the effect tends to be the opposite when the target company is private.

Exploratory analysis and outlier detection

Table 1:

Statistic	Min	Pctl(25)	Mean	Pctl(75)	Max	St. Dev.
deal_value	1.000	19.593	835.173	341.445	164,746.900	4,418.937
carbidder	−0.590	−0.042	0.009	0.055	1.368	0.116
bidder_size	400.500	144,881.700	5,154,525.000	2,388,443.000	432,000,000.000	19,739,995.000
sigma_bidder	0.007	0.022	0.037	0.045	0.280	0.023
run_up_bidder	0.238	0.820	1.191	1.332	4.688	0.692
relsize	0.010	0.047	0.373	0.371	12.170	0.850
bidder_mtb	0.324	1.387	2.867	3.070	58.041	3.475
bidder_fcf	−1.193	−0.011	−0.011	0.086	0.253	0.215
bidder_lev	0.000	0.002	0.155	0.260	0.747	0.176

Comments on the Table 1

Comments to figure 1 just by looking at the scatterplot we indicate a huge outlier This could be an error but nonetheless should be removed from the dataset
overall there seem to be other "smaller" outliers and we therefore have to winsorize or use log-transformation because of the shape of the historgram we decided to use log-transformations

Comments to figure 2

Comments to figure 3 Seems suspicious to be an error but we believe the reason for high values only in year 2000 is the dotcom bubble

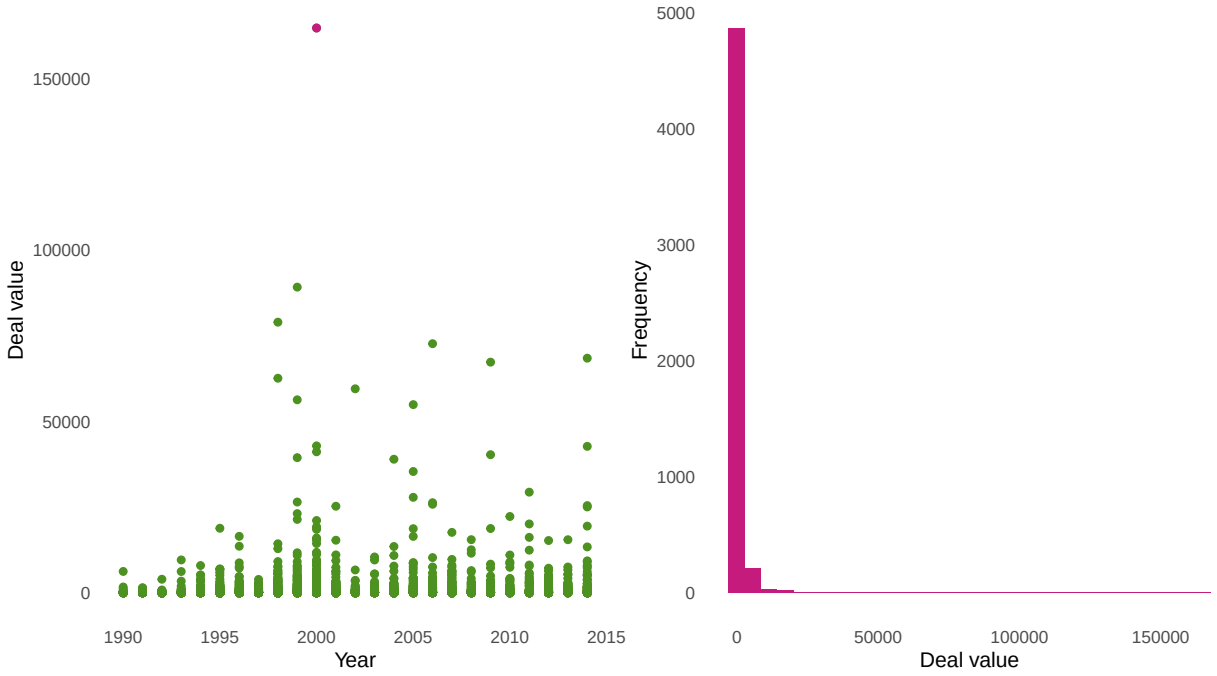

Figure 1: Scatterplot and histogram of deal value

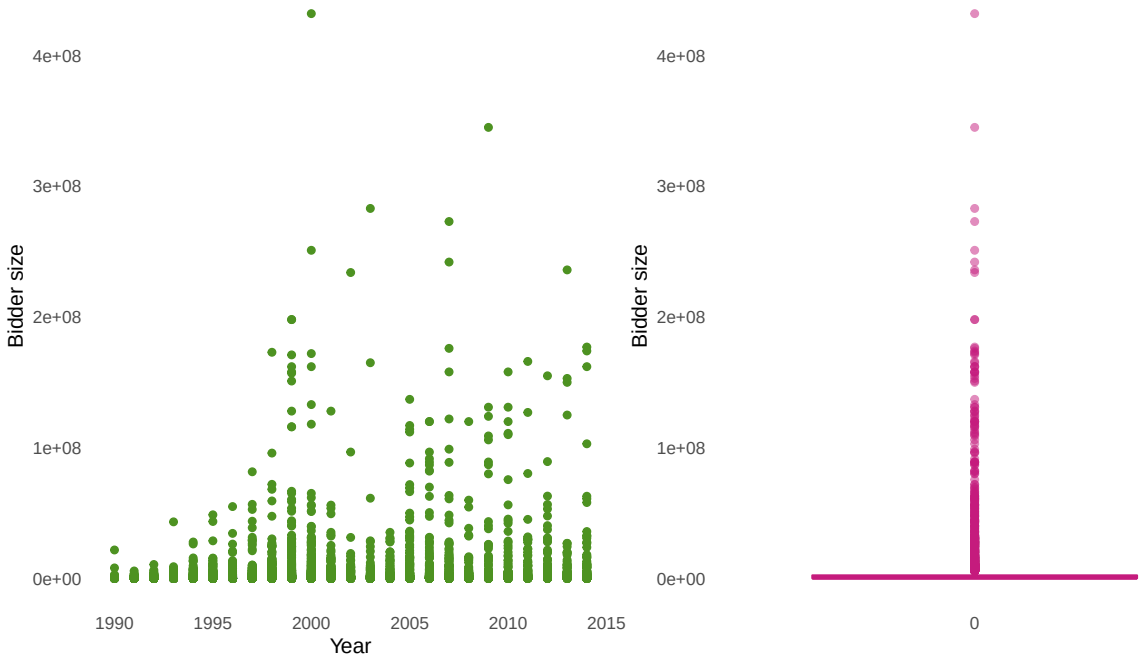

Figure 2: Scatterplot and boxplot of bidder size

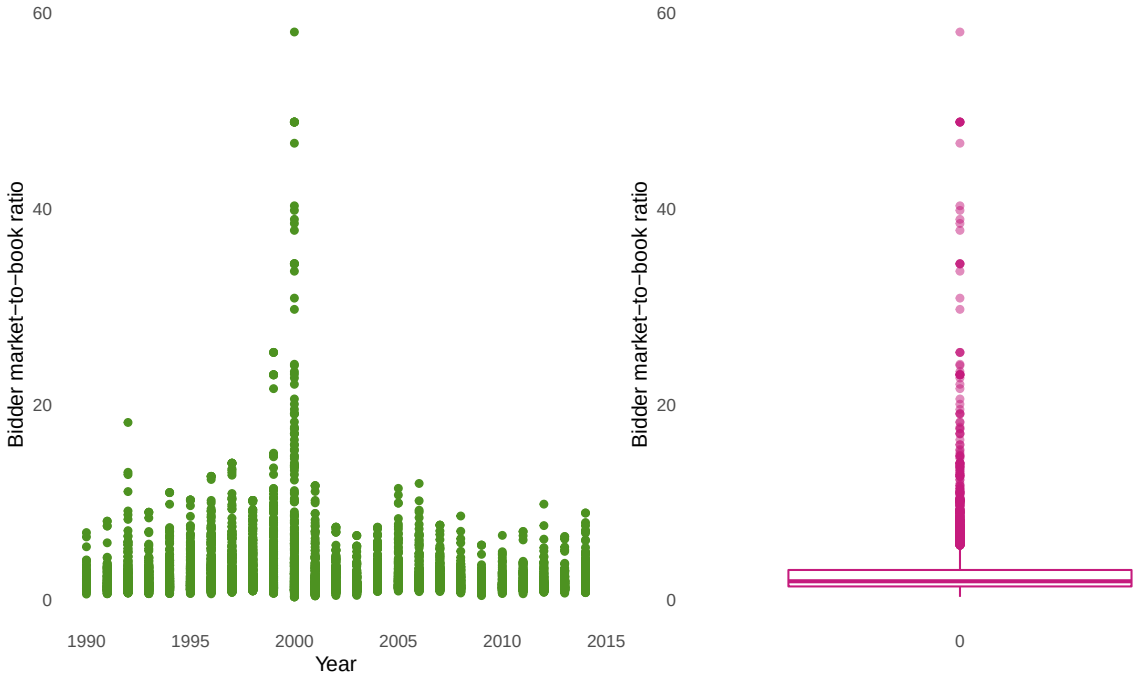

Figure 3: Scatterplot and boxplot of bidder book-to-market ratio

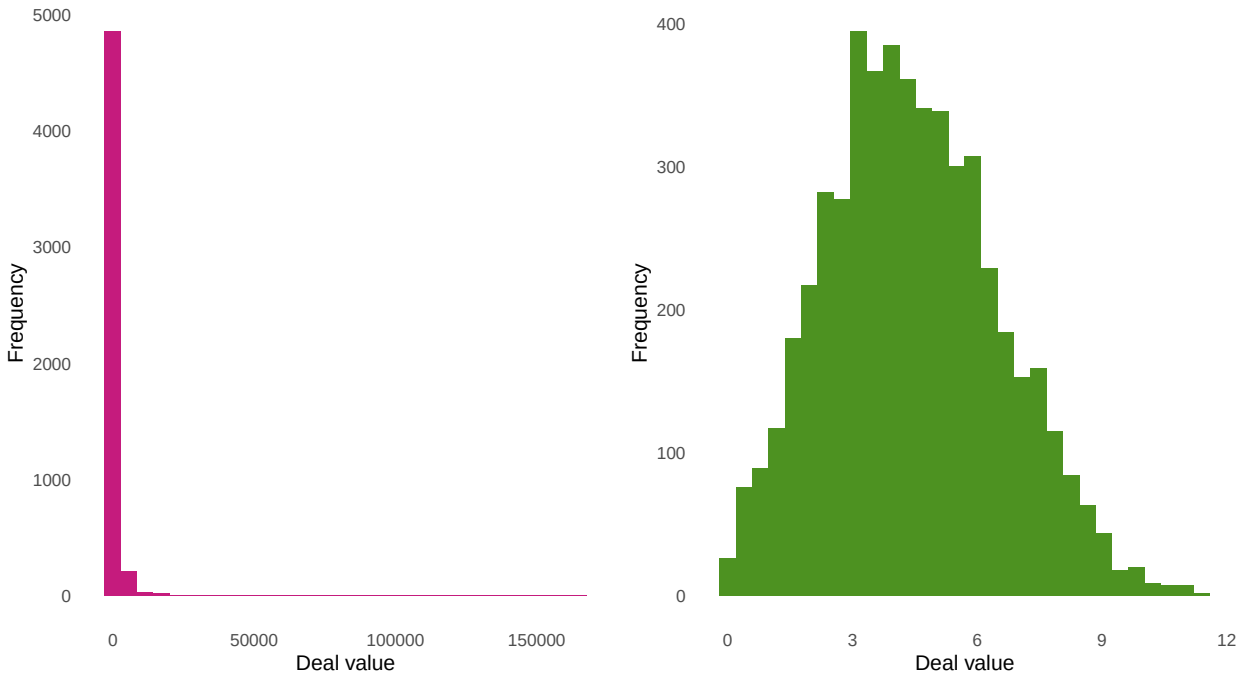

Figure 4: Deal size histogram before and after log-transformation

Table 2:

	year	avg_deal_size	avg_bidCAR	avg_share_private	avg_share_stock
1	1990	3.303	-0.009	0.448	0.478
2	1991	3.183	0.042	0.612	0.515
3	1992	3.16	0.029	0.719	0.597
4	1993	3.146	0.042	0.673	0.491
5	1994	3.663	0.021	0.59	0.556
6	1995	3.823	0.013	0.581	0.578
7	1996	4.057	0.021	0.58	0.589
8	1997	4.298	0.019	0.538	0.54
9	1998	4.409	0.008	0.5	0.5
10	1999	4.797	0.013	0.468	0.522
11	2000	4.851	-0.017	0.544	0.529
12	2001	4.604	-0.021	0.394	0.389
13	2002	4.082	-0.012	0.503	0.284
14	2003	4.381	0.02	0.485	0.263
15	2004	4.487	-0.001	0.551	0.177
16	2005	4.892	-0.004	0.571	0.171
17	2006	5.047	0.006	0.51	0.161
18	2007	5.047	0	0.515	0.102
19	2008	4.691	0.001	0.598	0.165
20	2009	4.956	0.003	0.45	0.2
21	2010	5.192	0.007	0.437	0.118
22	2011	5.313	-0.005	0.612	0.095
23	2012	5.429	0.03	0.491	0.069
24	2013	5.384	0.029	0.57	0.112
25	2014	5.197	0.023	0.562	0.171

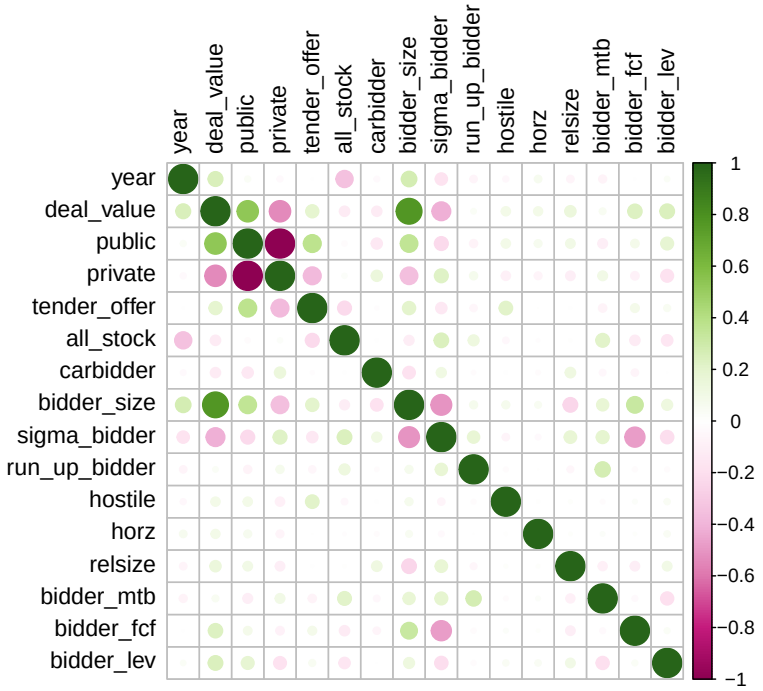

Figure 5: Correlation plot

Table 3:

	Dependent variable:					
	carbidder					
	(1)	(2)	(3)	(4)	(5)	(6)
all_stock	0.014^{***}	-0.023^{***}	0.014^{***}	0.012^{**}	-0.014^{***}	0.016^{***}
	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
public			-0.019^{***}			-0.018^{***}
			(0.004)			(0.005)
I(all_stock ∗public)			-0.037^{***}			-0.040^{***}
			(0.007)			(0.007)
deal_value				0.012^{***}	-0.006^{***}	0.004^{**}
				(0.003)	(0.002)	(0.002)
bidder_size				-0.015^{***}	-0.001	-0.008^{***}
				(0.002)	(0.002)	(0.002)
bidder_mtb				-0.0002	-0.002^{**}	-0.001^{**}
				(0.001)	(0.001)	(0.001)
run_up_bidder				0.002	-0.008^{**}	-0.002
				(0.003)	(0.004)	(0.002)
bidder_fcf				0.006	-0.001	0.004
				(0.011)	(0.013)	(0.008)
bidder_lev				-0.001	0.037^{***}	0.014
				(0.015)	(0.012)	(0.010)
sigma_bidder				0.269^{**}	-0.275^{*}	0.236^{**}
				(0.125)	(0.149)	(0.095)
relsize				0.023^{***}	0.001	0.011^{***}
				(0.004)	(0.003)	(0.002)
horz				-0.001	-0.002	-0.003
				(0.005)	(0.004)	(0.003)
tender_offer				0.013	0.010^{**}	0.014^{**}
				(0.044)	(0.005)	(0.006)
year				-0.0004	0.001^{***}	0.0002
				(0.0004)	(0.0004)	(0.0003)
hostile					0.001	-0.004
					(0.015)	(0.018)
Constant	0.019^{***}	0.00003	0.019^{***}	0.854	-1.975^{***}	-0.320
	(0.003)	(0.003)	(0.003)	(0.877)	(0.729)	(0.586)
Observations	2,769	2,384	5,153	2,769	2,384	5,153
Adjusted R^2	0.003	0.013	0.026	0.085	0.040	0.061
Note:	*p<0.1; **p<0.05; ***p<0.01					
	Notes with explanations?					