FIE401 - First assignment
M&A and Method of Payment

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Overview

Research question: Do mergers destroy value for bidder shareholders depending on the method of payment?

Corporate takeovers are among the largest investments that a company will ever undertake. M&A deals provide researchers with a unique opportunity to analyze value implications of important managerial decisions. Empirical research in this area has focused on a wide range of topics including size and division of takeovers gains (short- and long-run abnormal stock returns to bidders and targets). Data availability has allowed researchers to conduct empirical tests based on unprecedented sample sizes and detail.

In this assignment, you have to evaluate the announcement effect of takeovers on the wealth of bidder shareholders and study the impact of the method of payment (stock versus cash). In addition, you ask whether this impact is different for public and private targets.

Researchers have been investigating merger announcements and the method of payment for decades. See this passage from Officer, Poulsen, and Stegemoller, 2007.

> Particularly compelling is the result that announcement returns are significantly negative on average when acquirers use stock to acquire publicly traded targets (Travlos, 1987), whereas the opposite is true for takeovers of privately held targets (Chang, 1998). A widely accepted rationale for the negative returns associated with stock payments for public targets is adverse selection: managers use stock as currency to pay for acquisitions only when that stock is overvalued.[2] A further puzzle, therefore, is why the method of payment is associated with such different valuation effects in acquisitions of public versus private firms.

For a list of papers investigating the choice of payment in a merger setting, see Betton et al., 2008, Table 4.

Formalities

This assignment will be handed out on September 15th at 17:00 and has to be submitted no later than the September 22nd at 14:00. Submit your commented coding file (file extension: ".R") and a pdf file (file extension: ".pdf") including the numerical results and answers to questions posted.

Please comment your code shortly so that a reader can reconstruct your thinking. You do not need to explain the used functions. You do not need to describe your coding in the pdf file. Please keep your answers very brief.

On Canvas, you will find a guideline of how to make good tables. Note that in the last lecture of this course, we will cover the subject of how to present research in detail.

After submission, the assignments will be randomly redistributed. Read your peer's work carefully and compare your solution to theirs. There are many different approaches to code the same exercise, so let's learn from each other.

In order to make it easy for us to allocate individual assignment submission, please follow following file name structure. For the assignment submission: "Assignment1_group_XX.R/pdf". "XX" indicates the group number that submitted the assignment.

Please do not include any personal information such as name, student number, etc. in the submitted files.

Work together in groups of four.

Submit your assignment even if you do not finish all tasks. For a pass, 50% has to be correct.

Note that some concepts are introduced for first time in this assignment. Please use online resources actively.

We touched on almost all functions you have to use to solve this assignment. If you are unsure how to use a function, either use R's own documentation (type ?command) or use www.stackoverflow.com. We encourage you to code this assignment yourselves, and not to use purpose-made solutions or packages as provided on the internet.

Before starting to code, try to separate the task into smaller pieces.

Data provided for this assignment

CAR_M&A.Rdata contains 5,154 deals over the 1990-2014 period. The sample consists only of deals that fulfill a set of criteria that are typically used in the literature:

- Domestic transactions (U.S. acquirers and U.S. targets)
- Completed control transactions (acquirer holds less than 50% of the target shares before the announcement and ends up with 100% of the target shares)
- Public acquirers and targets of all statuses (private, public, subsidiaries)
- Deal value of at least 1 US$ million
- Relative transaction size (ratio of the deal value to the acquirer market value) of at least 1%
- Financial industries (SIC codes 6000-6999) excluded
- Necessary information available in the CRSP and COMPUSTAT databases to compute the acquirer cumulative abnormal return (CAR) and the set of control variables.

The dataset includes a set of variables widely used in M&A literature (e.g., Moeller et al. (2004); Golubov et al. (2015)):

- yyyymmdd: year, month, and day of the deal announcement;
- yyyy: year of the deal announcement;
- carbidder: The acquirer CAR calculated over a three-day event window centered on the deal announcement, as reported in the SDC database. Abnormal returns are calculated using the market model. Estimation window is from day -300 to day -91 relative to the announcement on day 0;
- deal_value: the deal value in millions of U.S. dollars;
- bidder_size: the bidder's market value at the end of the fiscal year before the acquisition announcement in millions of U.S. dollars;
- all_stock: a dummy variable equal to 1 if the transaction is fully paid in stock;
- private: a dummy variable equal to 1 if the target is a private company;
- public: a dummy variable equal to 1 if the target is a public company;
- bidder_mtb: the acquirer market value of assets (defined as the book value of total assets minus common equity plus the market value of equity) divided by the acquirer book value of assets;
- run_up_bidder: the market-adjusted buy and hold return of the acquirer's stock price from day -210 to day -11 with respect to the announcement date;
- bidder_fcf (free cash-flow): the acquirer's operating income before depreciation minus interest expense and income taxes plus changes in deferred taxes and investment tax credit minus dividends on both

preferred and common share divided by the book value of total assets;
- bidder_lev (leverage): the acquirer's long-term debt divided by the market value of assets, defined as above;
- sigma_bidder: the standard deviation of the acquirer market-adjusted daily returns from day -210 to day -11 with respect to the announcement date;
- relsize: the ratio of the deal value to the acquirer market value;
- horz (horizontal): a dummy variable equal to 1 if the bidder and the target operate in the same industry at the two-digit SIC code level;
- tender_offer: a dummy variable equal to 1 if the deal is classified as a tender offer in the SDC database; and
- hostile: a dummy equal to 1 if the transaction is classified as hostile in the SDC database.

Tasks

- Familiarize yourself with the data
  - Are there outliers? Evaluate if you should winsorize the data.
  - Are there some mistakes in the data? Evaluate to make adjustments to the data.
- Descriptives table 1
  - For each year in the sample, report the average deal size, bidder CAR, share of deals with private targets, and share of deals fully paid in stock.
- Descriptives table 2
  - By methods of payment (fully paid by stock or not), report the average of all variables you include in your regression model. Report the difference in means for both sub-samples and the associated p-value (t-test; text book page 119-120).
- Regression table
  - Make a regression table with 6 models.
  - The dependent variable is the bidder CAR.
  - The main independent variable is method of payment and whether or not the target is public or private.
  - Consider three sub-sample (2 models each): only deals with public target, only deals with private targets, and both.
  - For each sub-sample, do models with and without controls (3 times 2 = 6 models).
  - For the models with all deals, include an interaction term between method of payment and public/private status of target.
- Interpretation and additional questions
  - Make sure that your pdf starts with a short and consise abstract presenting your analysis (as you would in your Master thesis)
  - In writing, discuss the insights from both descriptive tables for your research design.
  - In writing, discuss your regression results briefly (5-10 sentences). Make sure that you discuss statistic as well as economic significance. Regarding the latter, argue whether or not the detected effects are meaningful.
  - Answer following questios specifically [difficult]:
    * Can you include both a dummy for private and public targets in the regression? If not, why?
    * If you limit the sample to private deals, what's the coefficient on the hostile variable?

References

- Betton, S., Eckbo, E., Thorburn, K., 2008, Corporate takeovers. In Handbook of Corporate Finance: Empirical Corporate Finance, Vol. 2, E. Eckbo, ed. Amsterdam: Elsevier/North- Holland
- Golubov, A., Yawson, A., Zhang, H., 2015, Extraordinary acquirers. Journal of Financial Economics, 116(2), pp. 314-330.
- Moeller, S., Schlingemann, Fr., Stulz, R., 2004, Firm size and the gains from acquisitions. Journal of Financial Economics, 73(2), pp. 201-228

- Officer, M., Poulsen, A., and Stegemoller, M., 2009, Target-firm information asymmetry and acquirer returns. Review of Finance, 13, pp. 467–493