

# M&A in Supplier-Customer Firm Relationships

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## 1 Goal

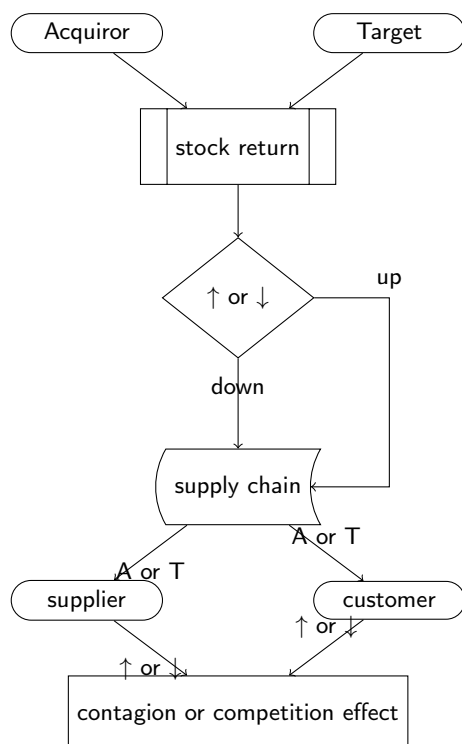
Since the M&A effect contagion along the supply chain in the M&A events has not yet received attention, we want to explore whether it exists contagion or competition effect in supply chain when M&A event happens.

### 1.1 Basic Assumptions

In the M&A market, there always exists opaque and even rumor informations. It's reasonable to implement the announced data as the start of such an event because of this characteristic. It's not until the event is announced public that it can lead to fluctuation in the market. In the meantime, we just take the completed status into consideration and ignore all the other status. The date that the event is effective is the end of such an event. After making sure of the start and stop time of this event, we also hope to know the equity of it. We simply take the return of that month to represent the equity of the company.

### 1.2 Flowchart

Here is a flowchart of the main goal and steps.



## 2 Normal M&A Events Tier1

### 2.1 Description of Data

There are four dta files MA SDC, Revere, Return and Market Return in this project. MA SDC has 317,375 objects and 66 variables that documents every M&A event, especially their Acquiror Cusip, Target Cusip, Start Date and Stop Date. The number of Acquiror company is 111,763 while the number of Target company is 250,214. Revere has 3,664,668 objects and 9 variables that documents the supply chain relationship, especially their Supplier Cusip, Customer Cusip and Date. In the supply chain network, we only have 12,530 suppliers and 14,132 customers. Return has 4,332,052 objects and 9 variables that documents the monthly returns of each cusip. Market Return has 1,093 objects and 4 variables that documents monthly benchmark returns. We choose a sample that ranges from 2003 to 2015 because it overlaps with the supply chain information. In the MA SDC dataset, we select DateAnnounced as the start date of M&A and DateEffective as the stop date of M&A. We drop the null value and save the rest 71.8%.

What is date with-drawn and the meaning of each status

What is the permno?

### 2.2 Analysis

In this lite version we use the monthly return changes after comparison with the benchmark return change. We define an Acquiror event as a company merge or acquire another one. Similarly, we define a Target event as a company is merged or acquired by the acquiror. Then we subtract the portfolio returns by the corresponding market returns and obtain the net returns. We name the variable NetRet. NetRet of firm  $j$  in month  $t$  is defined as  $NR_{jt} = Ret_{jt} - MktRet_t$ . Then we set some symmetric windows around the month of the event and compute the change of returns. We name the variable RetC. RetC of firm  $j$  in time window  $[a,b]$  is defined as follows:  $RetC_j[a,b] = NetRet_{jb} - NetRet_{ja}$ . We want to know how these two events affect the equity value along the supply chain upstream and downstream. For each event, we construct an equally-weighted portfolio of its customers and an equally-weighted portfolio of its suppliers at the exact month of the event. We then compute RetC of these portfolios using 3-month symmetric window around the time of M&A.

### 2.3 Implements

Because the dataset is too large that it cannot merge successfully, we choose to use cycle to select the same variables: Year, Month, AcquirorCusip, TargetCusip, Suppliercusip, CustomerCusip. Then we define a function that can flexibly set a window and select the corresponding return and compute the RetChange.

### 2.4 Results

## 3 Extreme M&A Events Tier1

### 3.1 Basic Analysis

There are some very important characteristics in the M&A dataset

1. The enterprise value of target company can reflect the size of M&A, it only has 20.9% virtual values.
2. The ofsharesAcq can reflect how much is the transaction, it will influence acquirors more than targets, it has 71.1% virtual values.
3. price per share during the transaction can reflect the expected value of such an event.

Thus, when analyzing the M&A events, we tend to believe that the larger the size of M&A, the more effect it will demonstrate along the supply chain. Here we use a transaction size to get the 95th percentile to catch extreme acquiror events and extreme target events.

The measures are the same with the second part.

#### **4 Normal M&A Events in higher tier**

#### **5 Extreme M&A Events in higher tier**

#### **6 Prospect**

- Concentrate on different status of the transaction and explore the meaning of Dateannounced. Also inspect the tendency through target company's closing price from 12 months before to 1 day before and analyze the relationship between this tendency and the supply chain's equity value.
- Explore different fields and respectively implement t-test.
- View the distribution in different windows and compare the upstream equity change and downstream equity change.