

Event Study Methodology: A Look at META and the Effects of the Amazon / IRobot
Acquisition Stalemate

Brady Bulls

Texas State University

QFE 5330 Financial Theory and Corporate Policy

December 8, 2023

Number 1:

Parts A

This event study analyzes three companies, Meta, Amazon, and IRobot. The Meta analysis includes events surrounding the company and its founder Mark Zuckerberg between the beginning of 2018 and the end of August 2023. These events include: The launch of Threads on July 5th, 2023, Twitter threatening legal action over the launch Threads on July 6th, 2023, Meta cutting 11,000 jobs on November 9th, 2022, Meta threatening to remove news from its site on December 5th, 2022, Facebook officially changing its name to Meta on October 28th, 2021, Mark Zuckerberg testifying to congress on April 10th, 2018, Zuckerberg appearing on the Joe Rogan podcast on August 25th, 2022, and Zuckerberg testifying to congress again this time over the Libra cryptocurrency on October 23, 2019. Figure 1 below shows the normalized stock returns over this period with each event marked, and figure 2 lists the events and the t-statistics for the

cumulative abnormal returns. Of these events, the only one that is not statistically significant is Facebook changing its name to Meta.

Figure 1

Standard returns are plotted at the end of the paper.

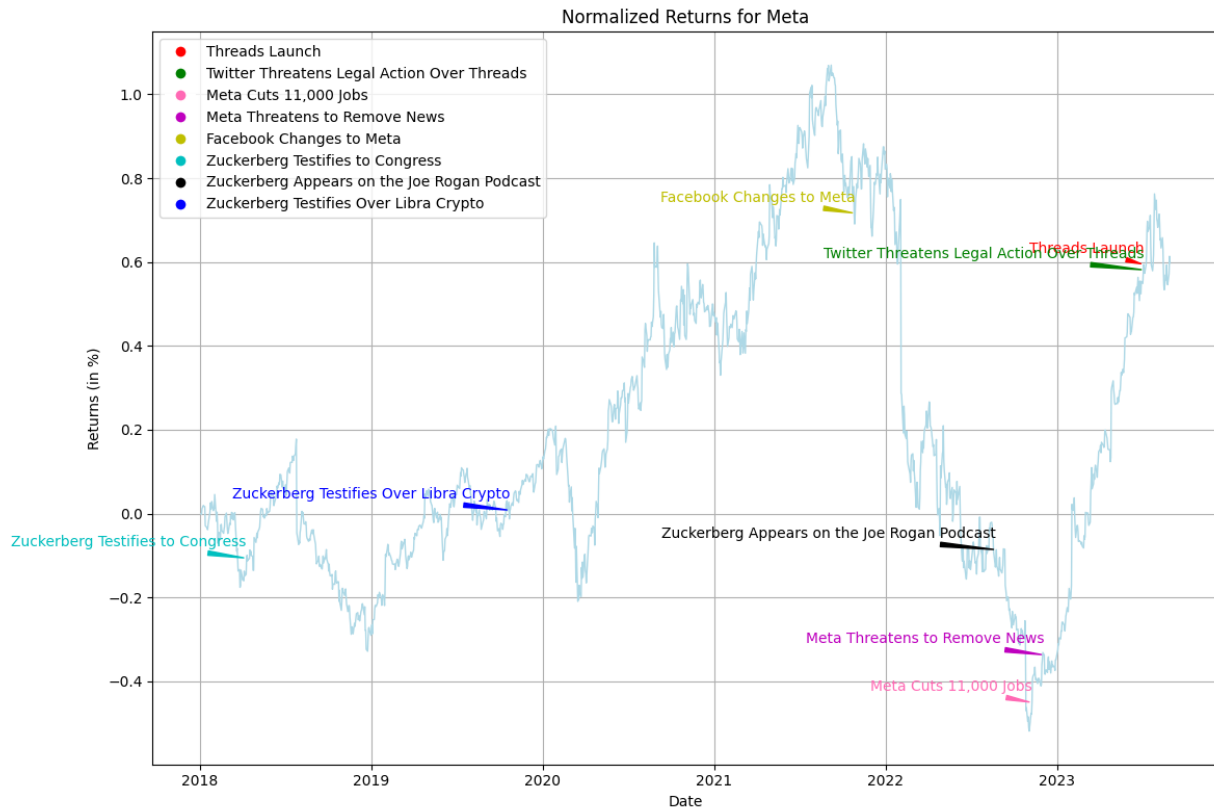


Figure 2

Event	T-Statistic of Cumulative Abnormal Returns
Threads Launch	6.4064
Twitter Threatens Legal Action	8.0859
Meta Cuts 11,000 Jobs	7.4423
Meta Threatens to Remove News	5.8373
Facebook Changes its Name to Meta	-0.3167
Zuckerberg Testifies to Congress	7.0587
Zuckerberg Appears on the Joe Rogan Podcast	7.9318
Zuckerberg Testifies Over Libra Crypto	-3.0828

As all but the name change t-stats are over the 95% critical value of 1.92, the abnormal returns are shown to be statistically significant from zero. The impact of every event is interesting. The launch of threads is a little more self-explanatory. It was Meta's answer to the popular tweets of Twitter. For a long time, Twitter dominated the quick drop in drop out style of social media. With Threads, Meta finally had a way to try and take some of the market share, and the stock reacted positively to that news. Twitter threatening legal action is an interesting case. According to the study, Meta stock saw an abnormal increase in the stock when they sent the letter to Zuckerberg's lawyer. One cause of this strangeness could be explained by how close these two events are to each other. Only being a day apart, they share almost identical estimation windows. It is possible that they are opposing forces, but the launch of Threads is the much stronger force. The launch could have had an even larger effect on the returns, but the threat of legal action pulled it down. When Meta cut 11,000 jobs, there was also an abnormal increase in the stock returns. This is a sign that investors see the cost cutting moves as a positive, so the share price saw a noticeable increase above the norm. In December of 2022, Meta threatened to remove news from its platform if congress signed a bill that would make it easier for news organizations to bargain collectively. This is another event that appears strange at first glance. One cause of the increase in returns above the norm could be attributed to Meta showing that they're willing to stand their ground. Meta stands to gain a lot from keeping the bargaining power of the new sources on its website in check. The investors appeared to have reacted favorably to that show of force. The one event that did now show any statistically significant changes was when Facebook changed their name to Meta. An odd choice, but not entirely out of

the ordinary. Investors clearly did not think it affected the underlying value of the company, and the returns were as expected during the event window.

Part B

Alongside the events surrounding Meta are the events surrounding its founder and CEO Mark Zuckerberg. As one of the more noteworthy CEO's, the events surrounding his life and the things he does and says have a strong sway on the stock price of his company. Two of the three events studied showed a positive abnormal impact on Meta stock returns, with the cryptocurrency hearing being the abnormal decrease. On April 10th, 2019, Mark Zuckerberg testified in front of congress as he was questioned about their misuse of user data and user safety. Looking at the returns, it appears the investors were reassured by the CEO's answers. The stock had been having some trouble leading up to the testifying, and the abnormal growth could be a sign that the investors felt better about how the company was handling itself in adversity. Mark Zuckerberg also appeared on the incredibly popular Joe Rogan Podcast. During the podcast the host, Joe Rogan, asked some tough questions of the CEO. The study shows that again, investors were reassured that the company was moving in a growth-oriented direction. The only abnormal negative returns surrounding Mark Zuckerberg was when he again testified in front of congress, this time to discuss their involvement with the cryptocurrency Libra. During the long hearing Zuckerberg was forced to admit that Meta, at the time Facebook, would have to leave the organization that governed Libra. Investors appeared to be worried about the answers that were given during the hearing, and the stock price saw a significant deviation from the expected returns.

Number 2:

Part A

The Amazon (AMZN) acquisition of IRobot (IRBT) is an all-cash deal that was originally priced at \$61/share but was later amended to \$51.75/share.

Part B

The equity cost of capital for IRBT is 12.0925%.

$$R_e = r_f + \beta(r_m - r_f)$$

Part C

The weighted average cost of capital for IRBT is 11.1165%.

$$WACC = CostofEquity \times \left(\frac{Equity}{Total\ Capitalization} \right) + CostofDebt \times \left(\frac{Debt}{Total\ Capitalization} \right)$$

Part D

The present value of the future cash flows at an estimated growth rate of 4 % is \$2,442.76 million, with a share price of \$78.99. Figure 3 shows the stock price sensitivity to the growth rate. As shown in the figure, the 10% change resulted in a more than 10% increase in the stock price, but not by much.

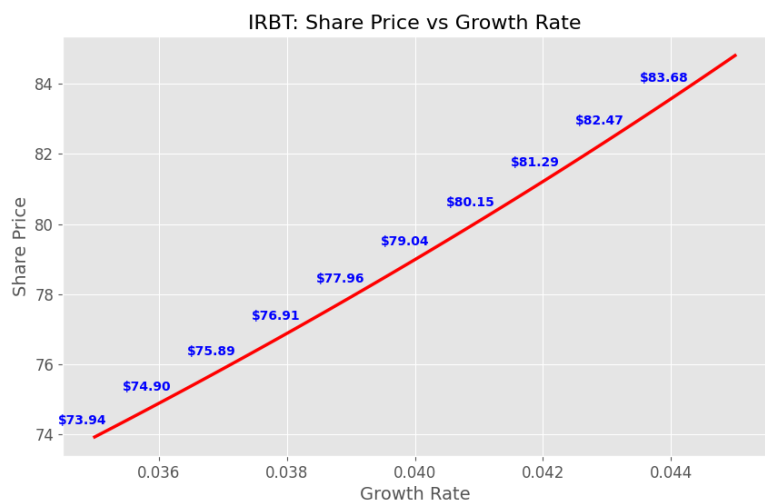


Figure 3

Currently the stock price is almost one-to-one with the growth rate.

b)

Re-estimated free cash flows from scratch using the financial statements comes out to be \$157.54 million, and the re-estimated price per share at 4% growth is \$80.44. The growth sensitivity is

shown in

figure 4.

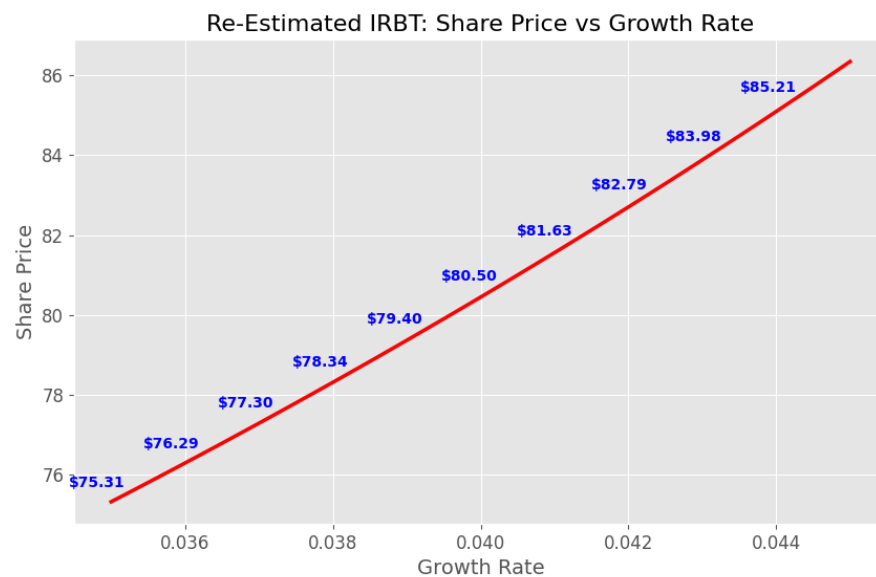


Figure 4

c)

Both price estimates come in much higher than the offers from Amazon, and there very well could be a rational reason behind that. As demonstrated by the figures, the stock price is closely tied to the growth rate. It could be that Amazon reasoned that IRobot's growth rate was much lower than investors estimated it to be.

Part E

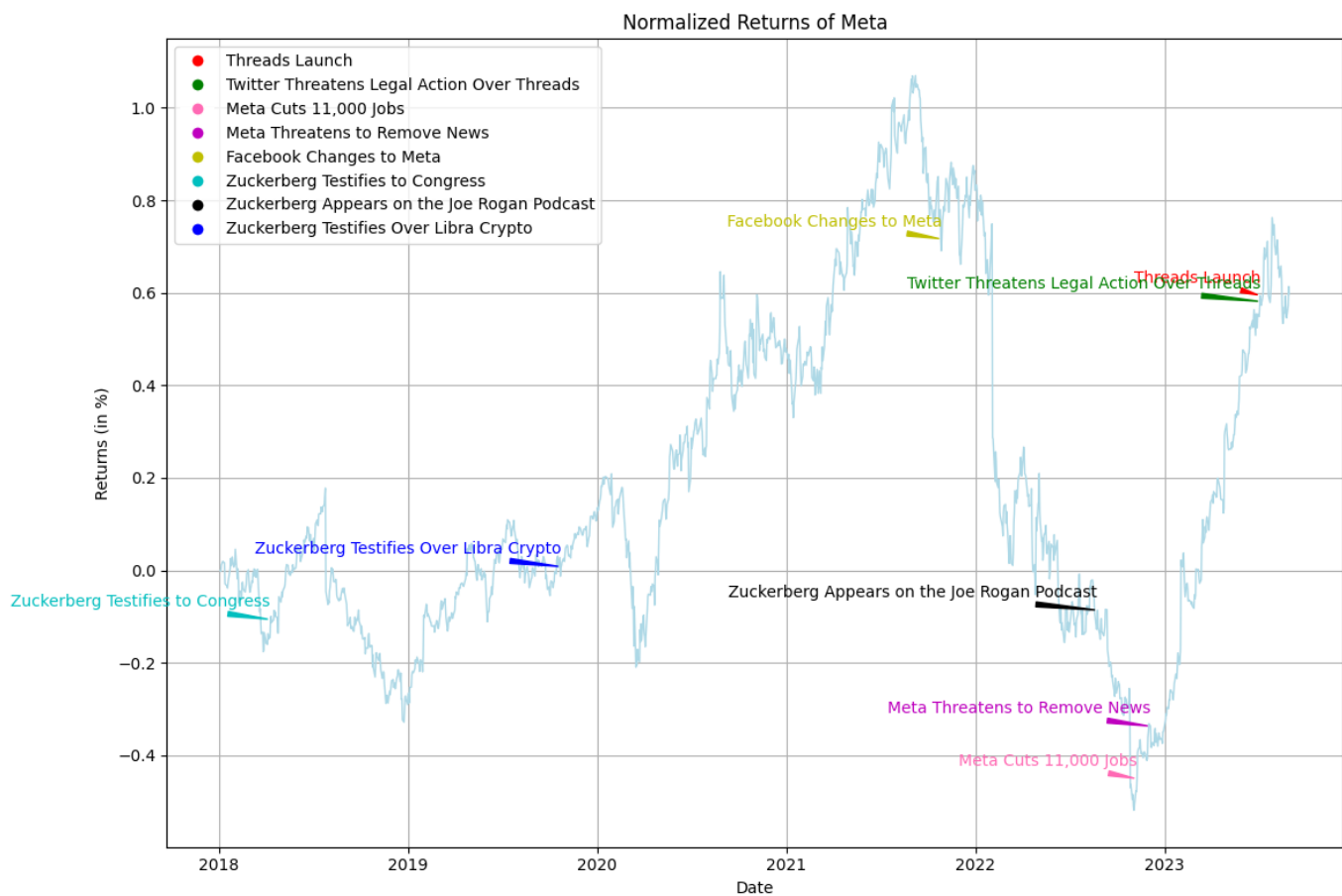
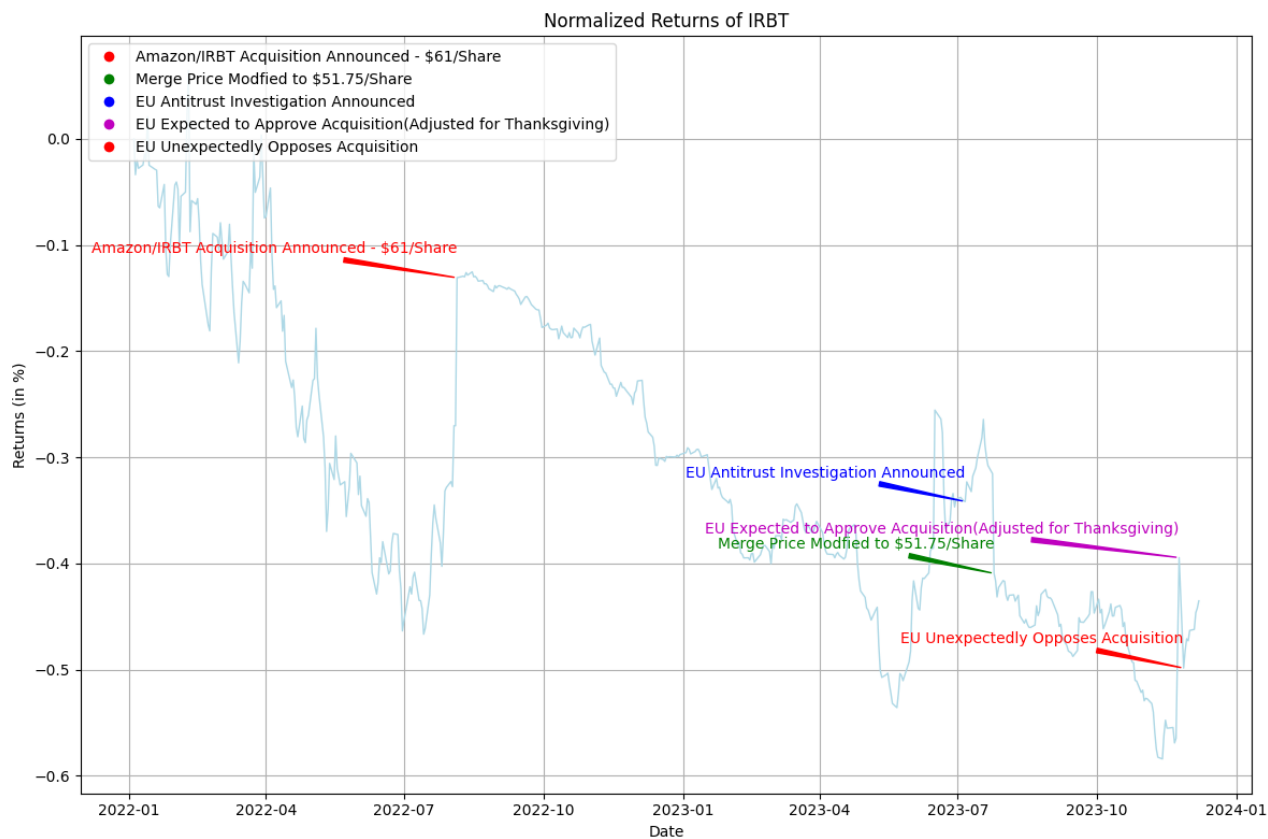
According to the results of the event study, the acquisition announcement was well received by investors, and on the IRBT side of the equation came as a relative surprise.

The t-statistics surrounding the announcement date are shown in the following two tables, and it should be noted that for IRobot they are majority insignificant aside from the day of the announcement.

Amazon Stock Event Window		IRobot Stock Event Window	
Date	T-Statistic	Date	T-Statistic
8/1/2022	3.7268	8/1/2022	0.9188
8/2/2022	0.6425	8/2/2022	0.1486
8/3/2022	7.5427	8/3/2022	4.861
8/4/2022	11.2115	8/4/2022	0.0803
8/5/2022	-4.7982	8/5/2022	14.6707
8/8/2022	-3.8573	8/8/2022	0.2299
8/9/2022	-2.282	8/9/2022	0.4646

Part F

The entire acquisition, other than its immediate reception, has had its fair share of troubles, especially for IRobots valuation. Almost one year after the announcement the purchase price was downgraded to \$51.75/share, and IRobots stock took a hit. A few months after that, the EU announced their anti-trust organization is launching an investigation into the acquisition, and the stock took another hit. Things started to look up when, on November 23rd, 2023, rumors were that the EU was going to approve the acquisition and IRobot's stock saw a nice gain. Then just four days later the EU announced that they were opposed to the acquisition and the stock nose-dived. All these events are illustrated in the following two figures, the normalized returns, one from the perspective of Amazon's stock, and the other from IRobots.



Standard Daily Returns with Events for META, AMZN, and IRBT

