Can Deal Failure Be Predicted?
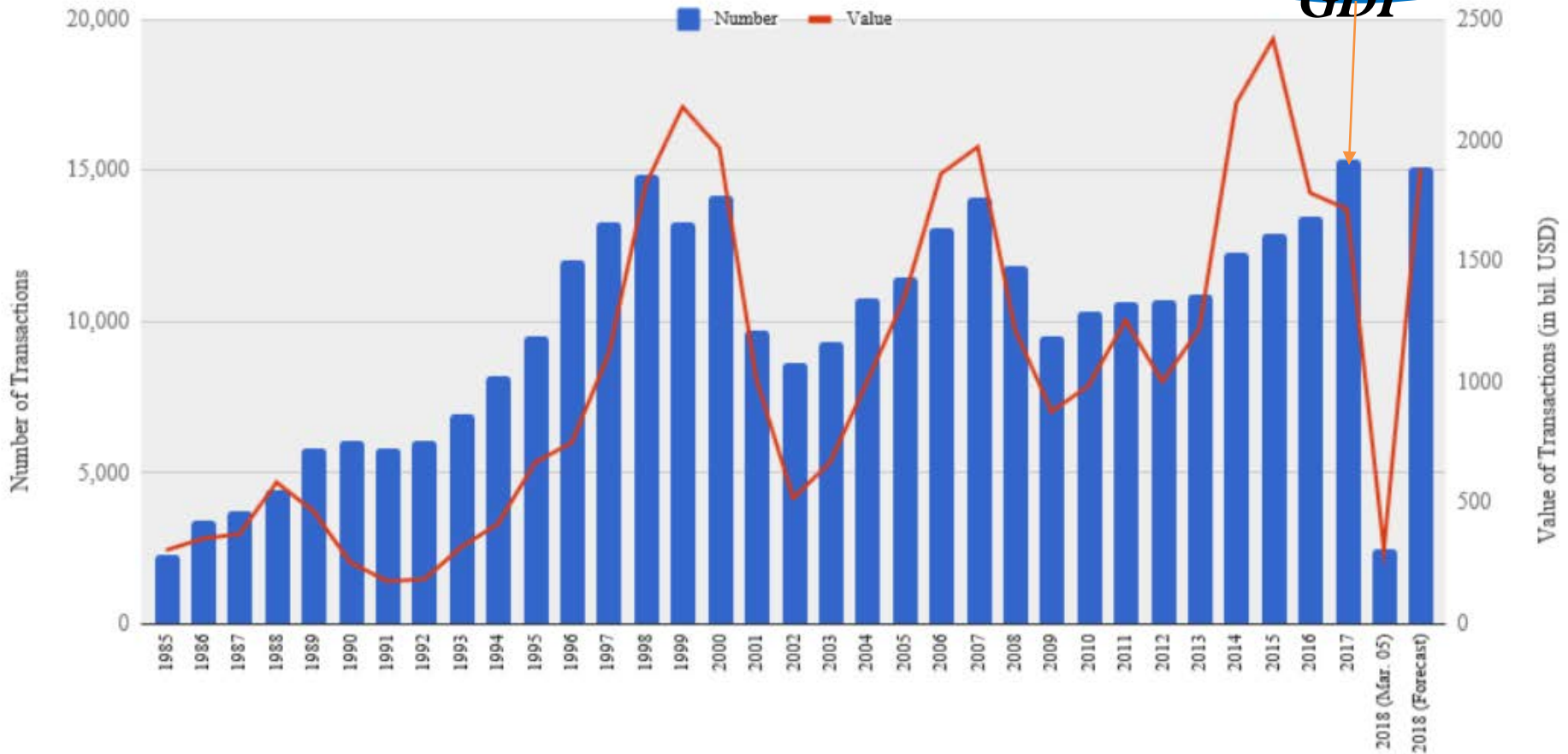
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M&A Activity in the U.S.

Mergers & Acquisitions in the United States

DOES M&A CREATE VALUE?

How To Measure M&A Value Creation?

- Ideal: ex-post performance of the merged entity minus the counterfactual performance had they not merged.
  - We do not observe counterfactuals.
  - Difficult to isolate the performance of the target and realized synergies.

- Long-term stock/accounting performance (ex-post measure)
  - Difficult to disentangle deal-specific causality from other firm, industry, and market-wide post-acquisition shocks.

- Event study/market reaction to announcement (ex-ante measure)
  - Easy to compute and short window helps to isolate event impact.
  - Eventus in WRDS

Popularity of CAR

Number of papers published in JF, JFE and RFS in last 10 years
2818

Of which, percentage of papers in M&A
6.4%

Of which, percentage of papers that measure deal quality
62.4%

Of which, percentage of papers that use CAR to measure deal quality
95.6%

TAKE AWAY:

It is almost a self-evident truth in finance that measure of value creation = market reaction at announcement = CAR

1) It is an ex-ante measure. So it assumes market efficiency.

2) Acquisition announcement returns may not only reflect value creation.

    a. It will include the market's assessment of the probability of deal completion

    b. It will include reassessment of acquirer standalone value due to the likelihood of future bids

    c. It will include expectations of changes in capital structure

    d. It may signal lack of investment opportunities

    e. It will be different for public vs public targets, stock financed vs cash financed, etc, etc

    f. etc…etc.

Ex-Post Measure from Accounting

Current assets - $3	
Tangible assets (PP&E) - $6	
Identifiable Intangibles (patents) - $4	
Goodwill (the residual) - $12	Going-Concern - $2
	Synergies - $6
	Overpayment/Overvaluation of Consideration - $3 = -AR*$V_{acq}$

Total Purchase Consideration - $25

LATER: GOODWILL IMPAIRED BY $9

TAKE AWAY:

(1) *It is a self-evident truth in accounting that ex-post measure of value destruction = goodwill impairment*

(2) *Finance's ex-ante = $3 < Accounting's ex-post = $9*

Is There a Link Between Finance's Ex-Ante Measure of Value Creation with Accounting's Ex-Post Measure?

Are we the first to ask this question?

YES

THESE PAPERS HAVE CAR AS ONE PREDICTOR:

Gu and Lev (2011), no linkage
Hayn and Hughes (2006), no post SFAS 142, 22% linkage for 56 deals
Henning, Lewis, and Shaw (2000), no post SFAS 142, no linkage
Li, Shroff, Venkataraman, and Zhang (2011), no linkage

Is Goodwill Impairment a Good Ex-Post Measure of Value Destruction?

- Impairments are value relevant (Li, Shroff, Venkataraman, Zhang (11)).
  - Negative market reaction to impairment announcement
  - We reconfirm this (Table II)
  - Impairments are leading indicators of declines in future profitability
  - We reconfirm this (some panels of Table X)

- New accounting rules in 2001 (SFAS 142):
  - Annual impairment tests → less discretion in write-down occurrence, amount, timing
  - Better disclosure of initial goodwill and impairment at reporting-unit level
    → easier to link impairment to a specific target

Problems with Goodwill Impairment

1) We only observe the lower tail of deal outcomes; such extreme failure events may not generalize to more moderate value destruction that does not result in a goodwill write-down.

Our response: Can CAR predict extreme failure?

2) Truncation error: goodwill cannot be increased to reflect underestimated value creation.

Our response: Will not affect forecasting probabilities. Will affect predicting magnitudes, and we will take care of this.

3) Annual impairment tests involve the determination of a reporting unit's fair value, which may be subject to valuation errors and manipulation. Managers have some discretion in the amount, timing, and choice of business unit to allocate the goodwill impairment.

Our response: It is hard to hide extreme value destruction. We only look at significant impairments.

4) Goodwill is not easy to estimate at a transaction level because Compustat reports at firm level and not at target level.

Our response: We manually read through 10-K Notes to determine the specific target that triggered impairment.

Manual collection of data

Number of deals from Jan 2003 to Dec 2013
2982

Deals with no goodwill data or not under Purchase Accounting
-1421 = 1561

Of which, deals not impaired/impaired
1000/561

Of 561, impairments that can be linked to a deal in sample
354

Of 561, impairments that can be linked to a deal out of sample
106

Of 561, impairments that cannot be linked to a deal
101

So, impaired = 354 and not impaired = 1000+106 = 1106
We link 83%; the best in accounting till now (Hayn and Hughes, 2006) link 22%

Goodwill is big!!!

About 51% of purchase price, about 10% of assets
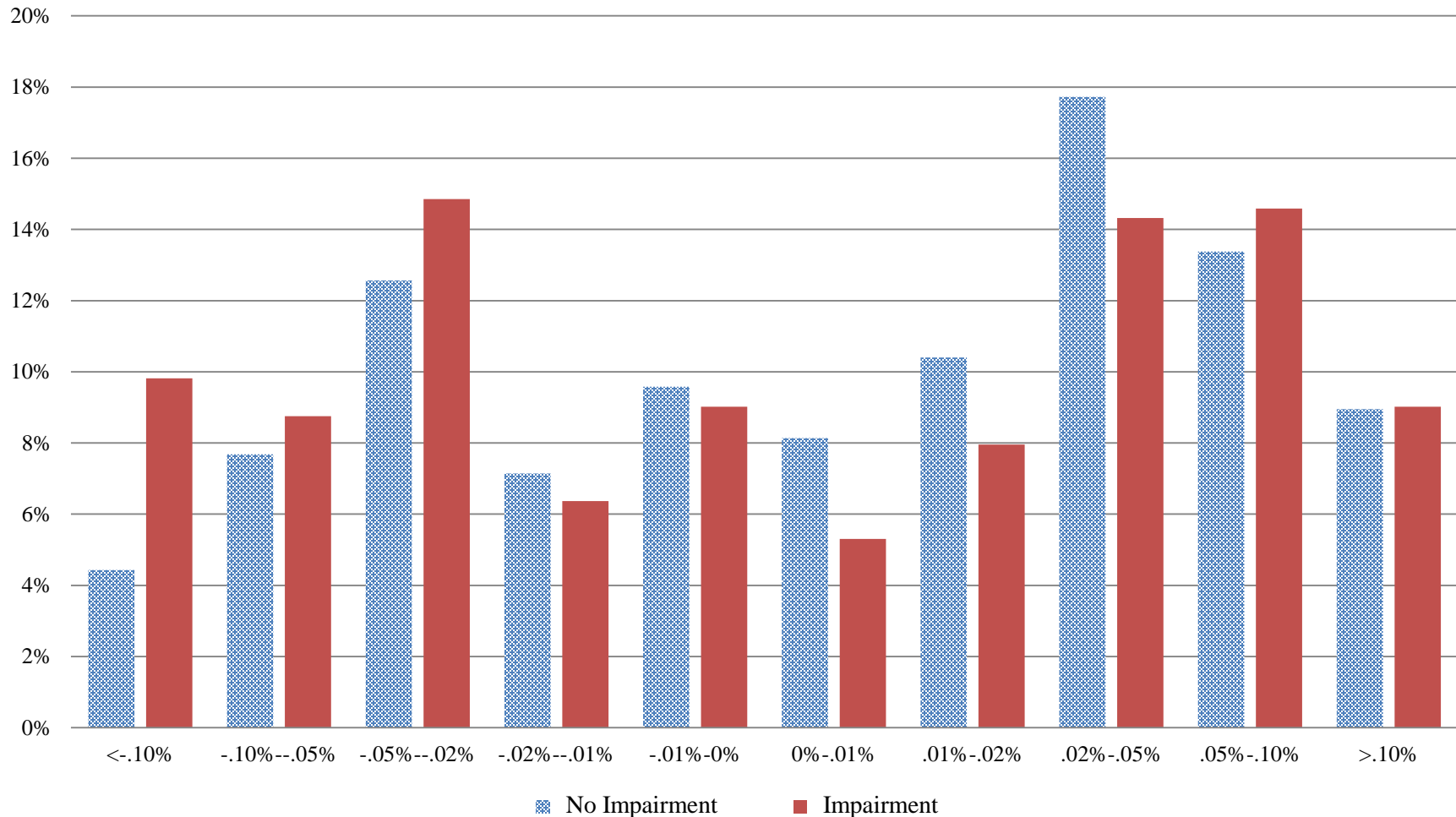
Goodwill impairments are common!!!

About 24% of deals impair

If they impair, most goodwill is wiped out!!!

86% of total transaction-level goodwill, 46% of the total purchase price, and 11% of acquirer assets. Overall, the aggregate impairment loss in our sample is $87 billion.

Can CAR Predict Impairment Probability? (Eyeball Tests)

Histogram of Acquirer Announcement Returns [-1,1]

Statistical significance: yes

Increase in CAR decreases the probability of impairment

Economic significance: no

A dramatic move from the highest quartile of announcement returns (+4.6% CAR) to the lowest quartile of announcement returns (-2.3% CAR) increases the probability of impairment from 24.25% to 26.1%

Type I and Type II errors

False positive when predict impairment: 44%

False negative when predict no impairment: 49%

CAR Exclusion Model

Explanatory power and Type I and Type II errors dramatically improve. Not much improvement after CAR is added back.
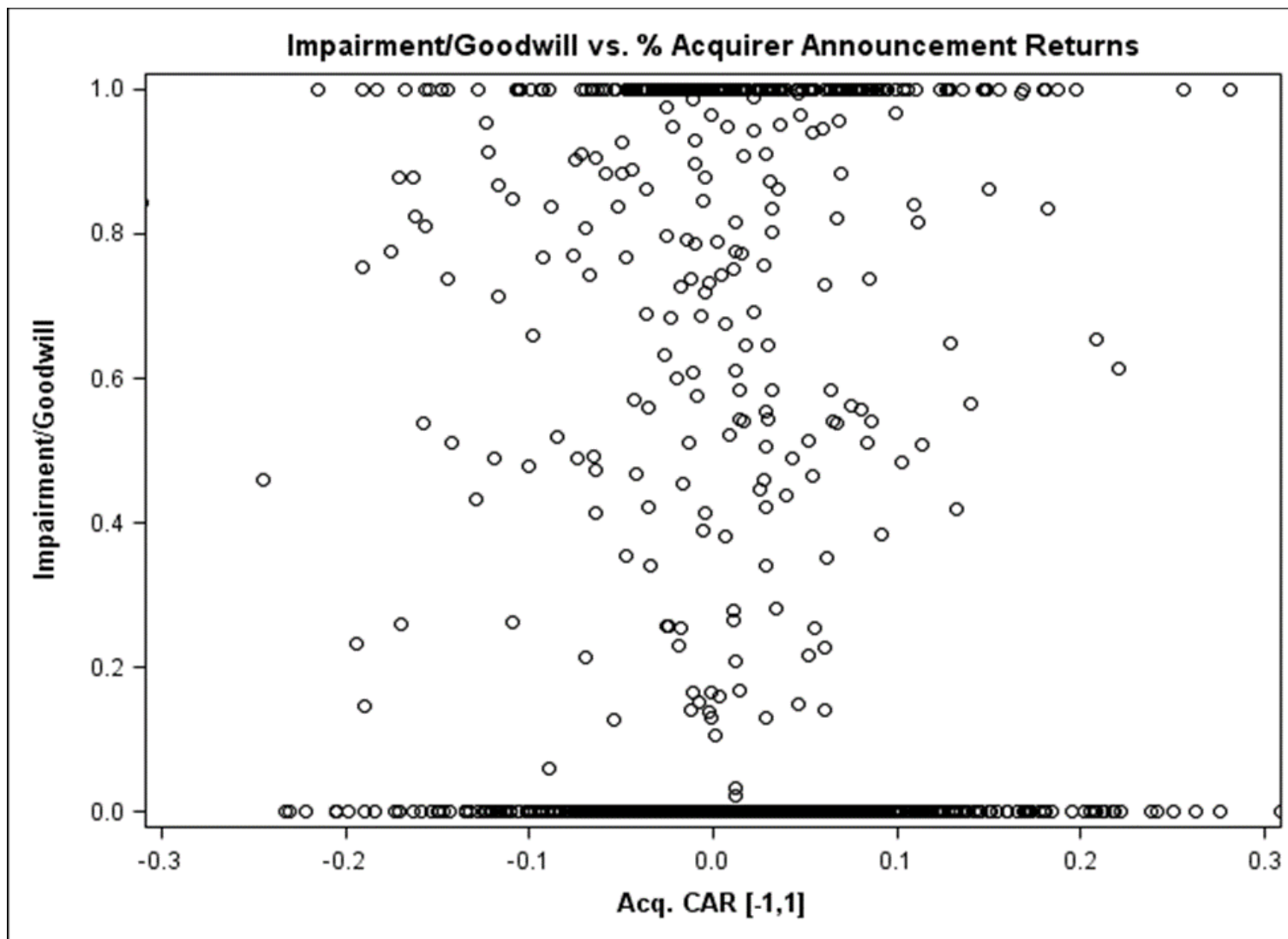
TAKE AWAY:

CAR has a modest power in forecasting the probability of impairment

Can CAR Predict Impairment Probability? (A formal test)

	Panel A: Predictive Ability of Acquirer CAR on Probability of Goodwill Impairment				
	% of Realized Impairment Sample in Each Decile				
	(1)	(2)	(3)	(4)	(5)
	CAR Only Model	CAR Exclusion Model	Full Model	CAR Exclusion Model	Full Model
Decile of model's predicted probability of impairment	Acquirer CAR	Deal/Firm Characteristics and Industry Controls	Acquirer CAR, Deal/Firm Characteristics, and Industry Controls	Deal/Firm Characteristics, Industry, and Announcement Year Controls	Acquirer CAR, Deal/Firm Characteristics, Industry, and Announcement Year Controls
1: Low Probability	10%	3%	3%	2%	2%
2	12%	6%	5%	3%	3%
3	6%	7%	6%	4%	3%
4	10%	9%	10%	5%	6%
5	8%	9%	10%	9%	8%
6	7%	10%	9%	10%	11%
7	10%	10%	9%	12%	13%
8	10%	12%	14%	16%	14%
9	11%	17%	15%	19%	20%
10: High Probability	15%	18%	19%	21%	21%
Total	100%	100%	100%	100%	100%
Decile 8+9+10 (High Predicted)	36%	47%	48%	56%	55%
Decile 1+2+3 (Low Predicted)	29%	16%	14%	8%	7%
Difference	8%	31%	34%	47%	48%

Can CAR Predict Impairment Magnitude? (Eyeball Test)

Impairment/Goodwill vs. % Acquirer Announcement Returns

Can CAR Predict Impairment Magnitude? (Formal Univariate/Multivariate Tests)

HKUST
BUSINESS SCHOOL
香港科大商學院
WORLD CLASS IN ASIA

Statistical significance: no

It also has the wrong sign. Increase in CAR increases the magnitude of impairment

Economic significance: N/A

Type I and Type II errors

False positive when predict above median impairment: 49%

False negative when predict below median impairment: 51%
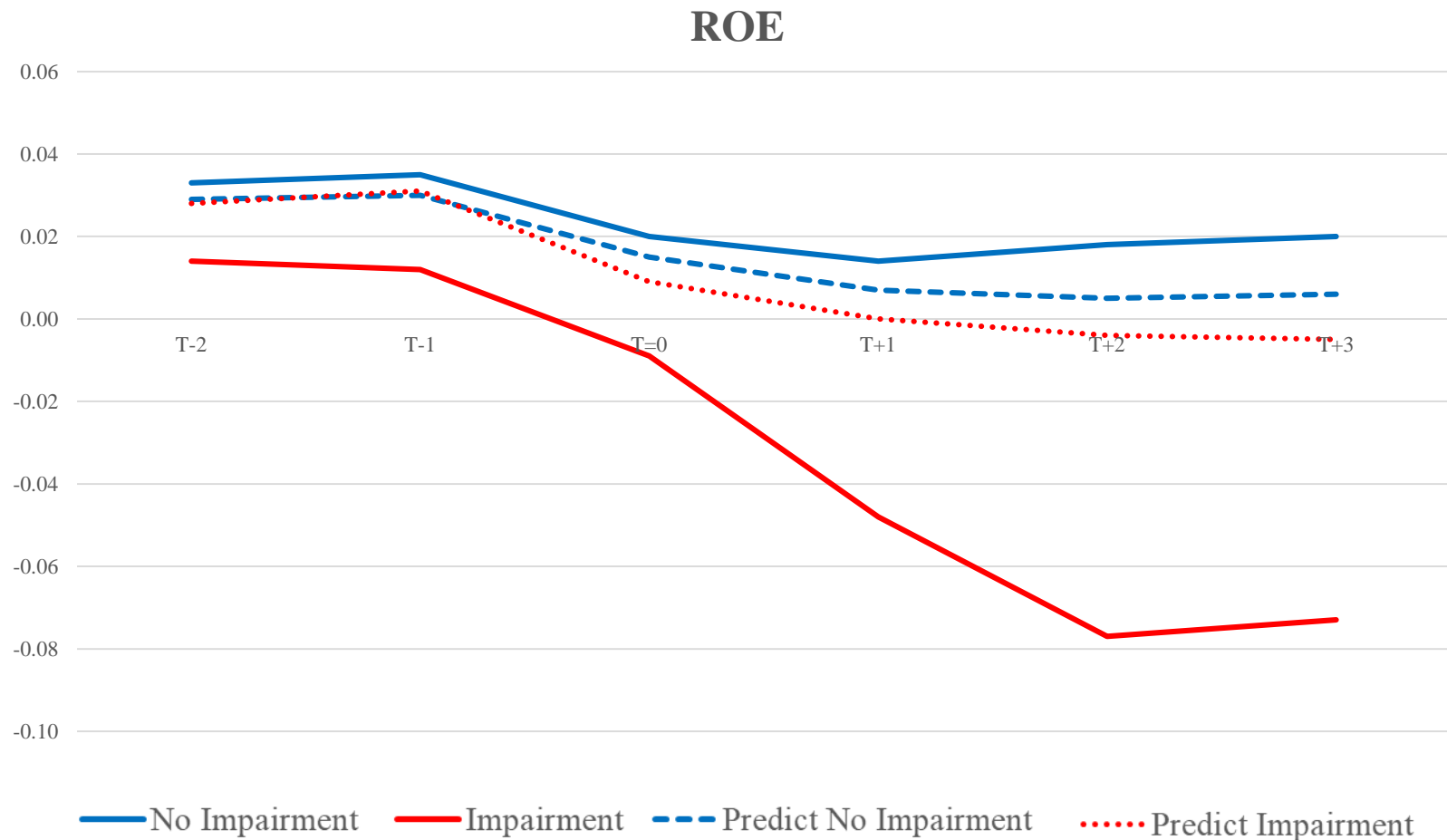
CAR Exclusion Model

Explanatory power and Type I and Type II errors dramatically improve. Not much improvement after CAR is added back

TAKE AWAY:

CAR has poor power in forecasting the magnitude of impairment

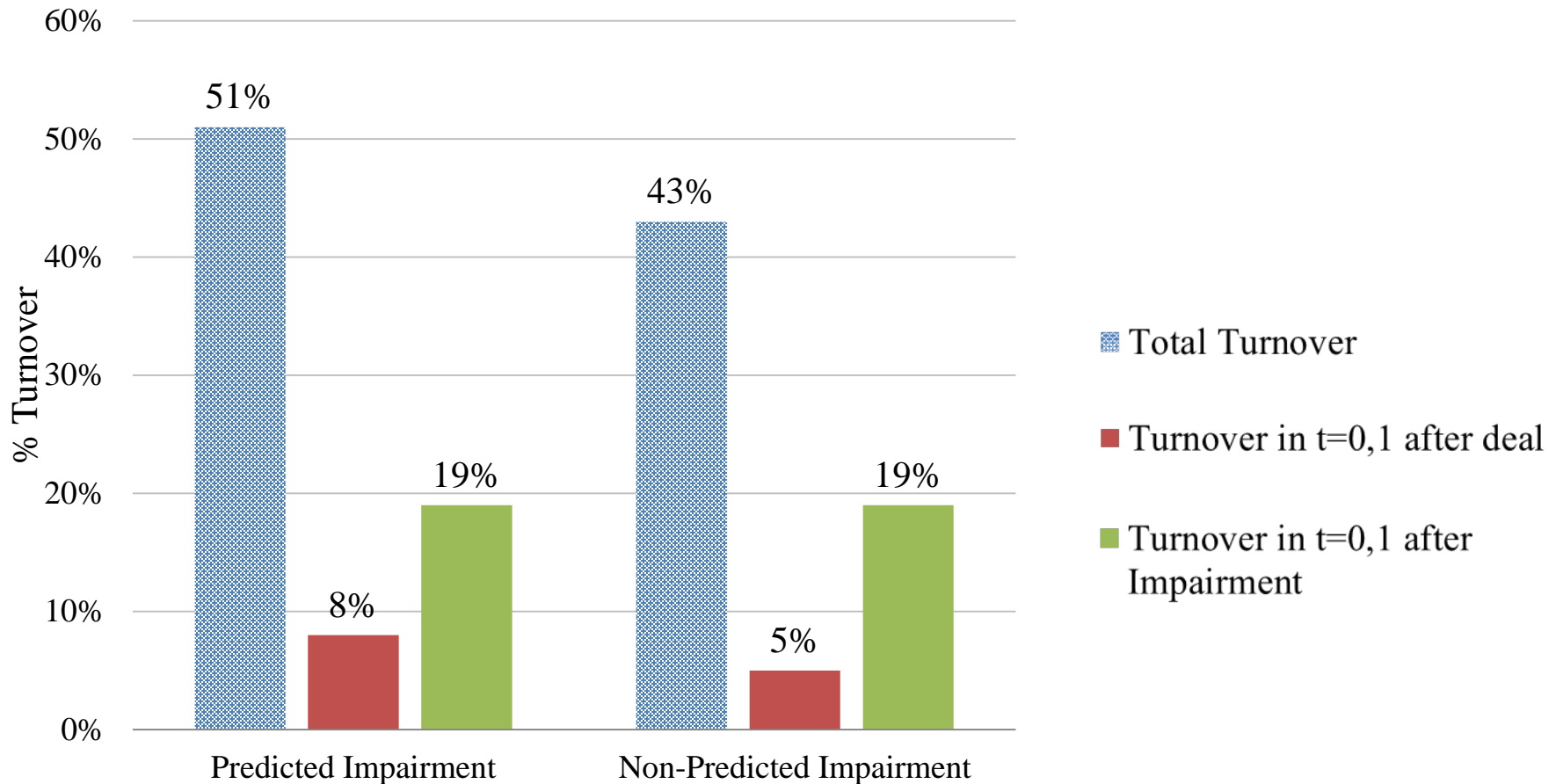# Can CAR Predict Future Acquirer Outcomes (Firm Metrics)?

ROE

Accounting performance metrics begin to materially diverge in the years following the announcement for the Impairment and Non-Impairment samples → Impairment firms encounter significant firm-level negative shocks. Little divergence for firms with predicted and no predicted impairment using CAR.

BHARs

Industry-Adjusted Buy-And-Hold Returns by Month Since Announcement
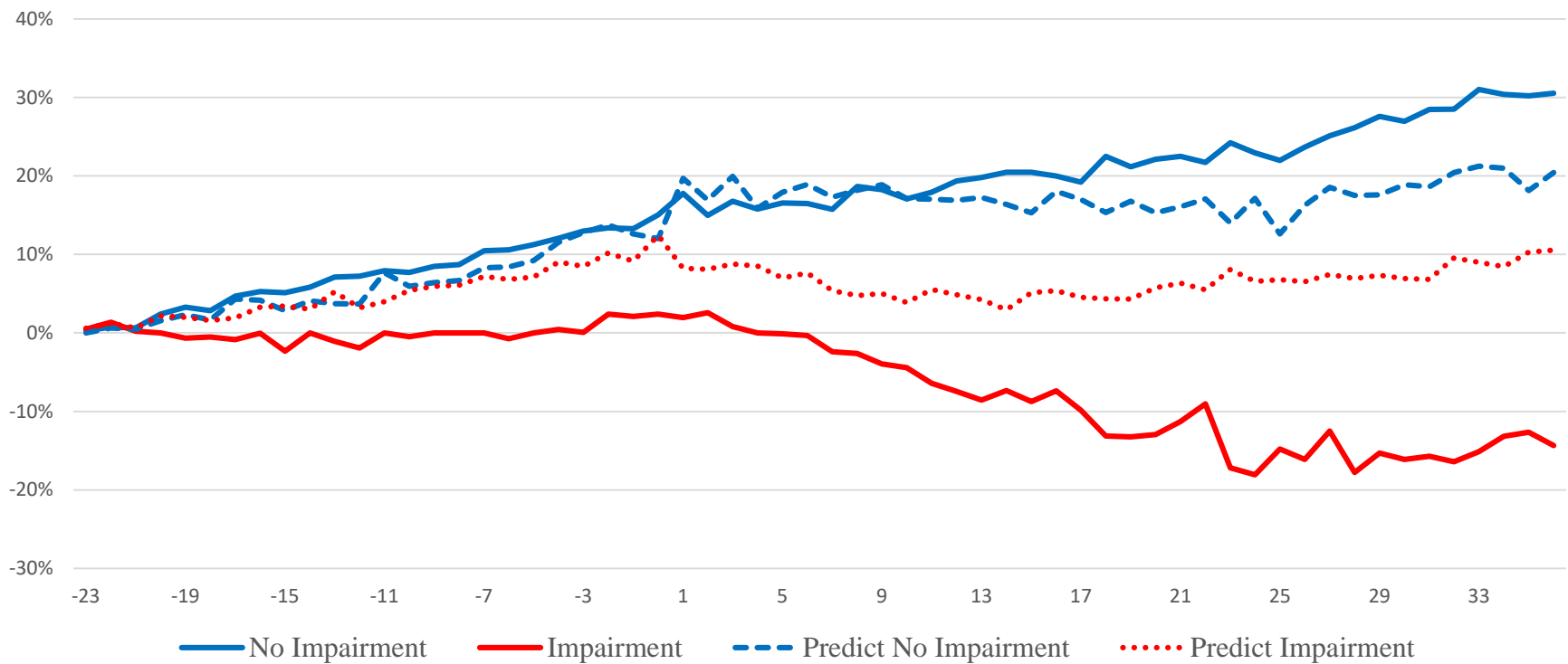
Can CAR Predict Future Acquirer Outcomes (CEO Turnover)?

CEO turnover events are 2.5x more likely to occur following the impairment rather than the deal announcement

Can CAR Predict Future Acquirer Outcomes (Exits)?

Post-Transaction Public Market Exits

	Non-Impairment Sample		Impairment Sample		Difference		Below Median Predicted		Above Median Predicted		Difference	
	#	%	#	%			#	%	#	%		
Merged/Went Private	263	23.8%	96	27.1%	3.3%	ns	179	24.6%	180	24.6%	0.0%	ns
Delisted	25	2.3%	31	8.8%	6.5%	***	29	4.0%	27	3.7%	-0.3%	ns
Bankrupt/Liquidated	2	0.2%	8	2.3%	2.1%	***	4	0.5%	6	0.8%	0.3%	ns

Ex-ante impairment expectations have no ability to predict distressed delisting.

We utilize an ex-post realized measure of deal outcome, the write-down of acquisition goodwill, to define deal failure. We find:

1) In a sample of 1,400 completed acquisition deals, goodwill exceeds 50% of the purchase price, is impaired for 24% of acquirers, and over 80% of goodwill is eliminated at impairment.

2) Announcement period abnormal returns have moderate power in forecasting the probability of impairment and poor power in forecasting the magnitude of impairment.

3) Accounting and stock performance measures begin to diverge in the years following the deal completion for the impairment and no impairment samples; no such divergence exists between the negative and positive announcement return samples.

4) Symptoms of deal failure – forced CEO turnover, poor long-term stock and operating performance, and distressed delisting – are associated with firms with goodwill impairment events, but negative acquirer announcement returns fail to forecast these ex-post outcomes.

5) Our evidence suggests that deal failure may be largely triggered by latent factors that are unknown at deal announcement.