

Detecting Information Pooling: Evidence from Earnings Forecasts after Brokerage Mergers

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Motivation

Substantial consolidation in financial sector in recent decades. What were effects of mergers?

- Much empirical literature focus on price effects
- But many enterprises of financial institutions are information-centric
- Focus on one-specific effect: opportunity for **information pooling**
→ combination of information and expertise which, prior to merger, were privately held by merging brokerages
- Focus on one enterprise: analysts' earnings forecasts
 - ▶ Very information-centric
 - ▶ Very good data available (analyst, stock-level)

Detecting information pooling: principle

Before merger: both brokerages have analyst covering (eg.) Apple Computer. Each has private information, private expertise.

After merger: both analysts are retained in brokerage. Does forecast accuracy for Apple improve, relative to stocks covered

- only by one brokerage pre-merger
- only one (or none) of pre-merger analysts retained?

⇒ detect IP by seeing whether forecast improvements more pronounced in subsamples of stocks for which information pooling should be stronger.

Data description

- IBES (Institutional Brokers Estimate System) database
- beg. 1983- mid 2002
- Focus on quarterly EPS forecasts

Four large mergers

Merger	A	B	C	D
Bidder Firm	Paine Weber	Morgan Stanley	Credit Suisse First Boston	UBS Warburg Dillon Read
Target Firm	Kidder Peabody	Dean Witter Reynolds	Donaldson Lufkin and Jenrette	Paine Webber
Merger Date	12-94	05-97	11-00	11-00
Bidder cover	440	852	1238	948
Target cover	381	418	749	494
"Affected"	137	197	383	224

In none of these mergers was improvement of research a major goal. However, did merger have effects?

- Large number of affected stocks (those forecast in common).
- Large amount of analyst selection [here](#)

Measuring forecast accuracy

- Standardized forecast error: defined as $FE_{ijt} = \frac{f_{ijt} - a_{jt}}{|p_{jt}|}$.
- Measure forecast accuracy by *mean-squared error* (MSE) of forecast errors K quarters surrounding merger:

$$\begin{aligned}
 MSE_{ij}^{pre} &= \frac{1}{K} \sum_{t=merg-K}^{merg-1} FE_{ijt}^2, \quad j = \text{bidder, target} \\
 &= \frac{1}{K} \sum_{t=merg+1}^{merg+K} FE_{ijt}^2,
 \end{aligned} \tag{1}$$

Consider only $K = 8$ quarters (short-term)

- Brokerage-level changes:** compare MSE^{post} to Avg ($MSE_{bid}^{pre}, MSE_{targ}^{pre}$)
- Analyst-level changes:** compare MSE_j^{post} to MSE_j^{pre} (same analyst j)

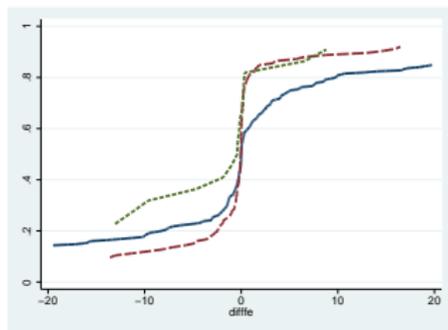
Brokerage-level forecast improvements

Define subsamples of stocks where IP should be (increasingly) stronger:

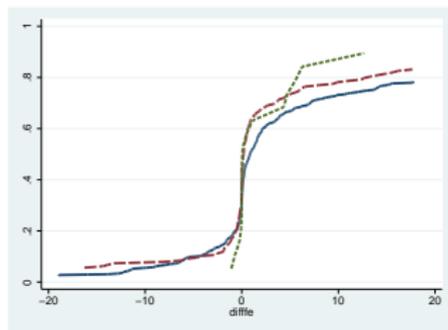
- 1 $AFFECTED_i = 1$ if stock i was covered by both the bidder and target brokerages prior to the merger
 - 2 $BOTHSTAY_i = 1$ if both the analysts who covered stock i at the bidder and target brokerages before the merger were retained in the merged brokerage.
 - 3 $BOTHCOVER_i = 1$ if both analysts cover stock i after the merger.
- $BOTHCOVER_i = 1 \Rightarrow BOTHSTAY_i = 1 \Rightarrow AFFECTED_i = 1$.
 - Also control for changes in timing before/after forecasts

Brokerage-level improvements: graphical evidence

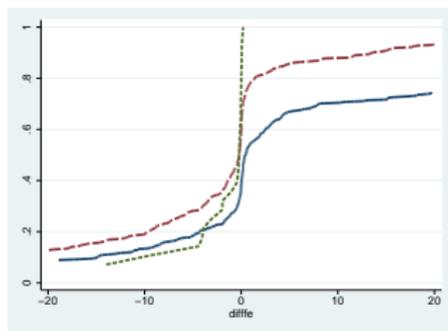
Blue: $AFFECTED_i = 0$; Red: $AFFECTED_i = 1$; Green: $BOTHSTAY_i = 1$



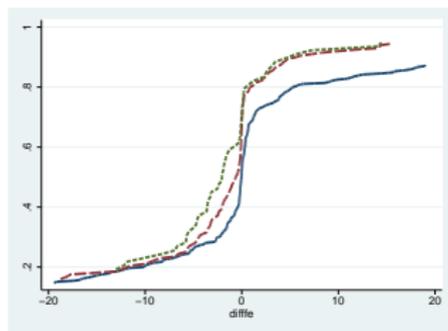
Merger A



Merger B



Merger C



Merger D

Brokerage-level forecast improvements: regression results

- AFFECTED coefficient is negative and significant for Mergers B, C: consistent with IP.
- BOTHSTAY negative and significant only for Merger D.
- BOTHCOVER neg and significant only for Merger C (but few stocks in this category).

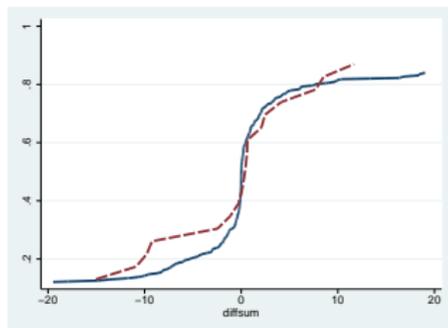
	Merger A		Merger B		Merger C		Merger D	
aff.	-0.05	—	-0.17	—	-1.99***	-1.92***	-0.32	-0.32
b-stay	-0.29	—	0.65	—	0.20	0.68	-1.50***	-2.42***
b-cover		—		—		-6.30***		0.92
N	408	408	562	562	744	744	539	539
med	-0.01		0.51		0.02		-0.14	
(aff=1)	137		198		383		224	
(bs=1)	25		21		31		86	
(bc=1)	2		1		4		17	

Analyst-level forecast improvements

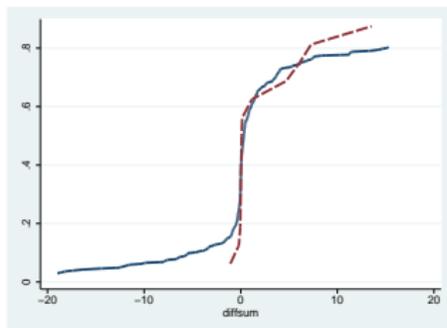
- As before, consider subsamples where IP should be stronger. Define $RIVALSTAY_{i,j} = 1$ if the analyst who covered stock i in the merger partner of analyst j 's brokerage ("rival analyst") was retained in the merged brokerage.
- Are improvements more prominent for stocks where $RIVALSTAY_{i,j} = 1$?
Start with graphical evidence.

Analyst-level forecast improvements: graphical evidence

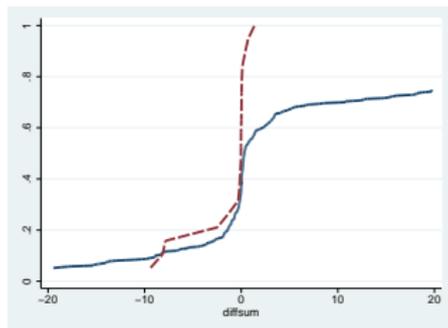
Blue: $RIVALSTAY_{i,j} = 0$; Red: $RIVALSTAY_{i,j} = 1$



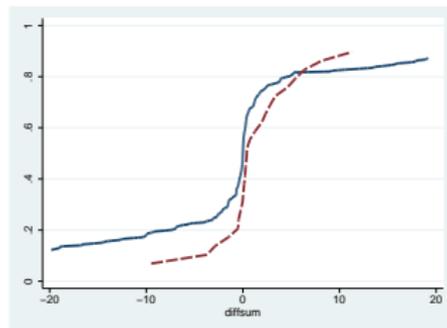
Merger A



Merger B



Merger C



Merger D

Analyst-level forecast improvements: regressions

Run regression separately for “bidder stocks” and “target stocks”

Some evidence of asymmetry:

- For bidder stocks: coefficient on RIVALSTAY is insignificant; no evidence of information pooling.
- For target stocks: evidence of IP after mergers A and D.

	Merger A		Merger B		Merger C		Merger D	
	B	T	B	T	B	T	B	T
RIVALSTAY	—	-17.16***	0.55	—	-0.79	—	0.26	-9.36***
N	53	30	100	6	134	44	80	110
med(ΔMSE_i)	0.001	0.27	0.77		0.02	-0.59	0.30	-0.66
(RIVALSTAY=1)	3	24	16	1	19	4	27	18

Analyst selection

- Evidence of IP is mixed.
- All 4 mergers led to great deal of analyst turnover.
- Alternative avenue for forecast improvements: analyst selection?
- Two margins of analyst selection:
 - 1 *Retention*: only better analysts (based on performance across all stocks) are retained
 - 2 *Assignment*: when both analysts retained, better analyst chosen on stock-by-stock basis.
- Observationally, both IP and analyst selection are similar: both imply post-merger forecasts more accurate than pre-merger forecasts.

Analyst selection

How prevalent were two types of analyst selection?

1. Retention margin: are better analysts retained? Not really—

Δ is negative for all four mergers, but only significant for Merger C

		Merger A	Merger B	Merger C	Merger D
Retained	Med. MSE	0.0387	0.0173	0.0354	0.0550
	<i>N</i>	40	60	110	100
Not Retained	Med. MSE	0.0538	0.0294	0.1666	0.0658
	<i>N</i>	47	24	93	48
Δ ret-unret.		-0.0151	-0.0121	-0.1312**	-0.0108

Analyst selection

2. Assignment margin: Are better analysts chosen to forecast stock?
Yes.

	Merg A	Merg B	Merg C	Merg D
Total N , of which:	23	20	27	73
#(analyst w/lower stock MSE chosen):	14	9	14	27**
#(analyst w/lower overall MSE chosen):	20***	18***	20**	35
#(analyst w/longer tenure chosen):	2***	14*	7**	40
#(analyst from bidder brokerage chosen):	1***	19***	24***	27**

Except for Merger D, better *overall* analyst chosen to forecast stocks where both bidders retained in firm.

Conclusions

- Exploit 4 large mergers of brokerages to examine whether changes in forecasting accuracy following mergers can be attributed to information pooling.
- Main test for IP: are forecast improvements more pronounced in subsamples of stocks where both pre-merger analysts retained?
 - ▶ At brokerage-level: IP evidence after Mergers C and D
 - ▶ At analyst-level: IP evidence only after Merger D (asymmetry)
 - ▶ Analyst selection: evidence that better analyst assigned to stocks, except after Merger D
 - ▶ Results for Merger D yield strongest evidence of IP. (Some corroborating anecdotes from business press that this was most “amicable” of four mergers.)
- Extension: explore oligopolistic effects of mergers on non-merging brokerages?

Four large mergers

All four mergers precipitated great deal of turnover: analyst selection is important.

		Pre-merger	Post-merger
Merger A:	<i>Paine Webber</i>	45	34
	<i>Kidder Peabody</i>	54	9
	New		13
	Total	99	56
Merger B:	<i>Morgan Stanley</i>	77	69
	<i>Dean Witter</i>	41	5
	New		13
	Total	118	102
Merger C:	<i>CS-FB</i>	130	104
	<i>DLJ</i>	86	17
	New		39
	Total	216	160
Merger D:	<i>UBS</i>	98	71
	<i>Paine Webber</i>	70	40
	New		24
	Total	168	135

[return](#)

Summary statistics: all stocks

		(a)	(b)		(c)		
	Statistic	Pre-merger			Post-merger		
		MSE_{bidder}^{pre}	MSE_{target}^{pre}	(a)=(b)?	MSE^{post}	(c)=(a)?	(c)=(b)?
A	median	0.00393	0.00232	**	0.00411	-	**
	mean	1.8738	1.4312		4.8083		
	#stocks	440	381		504		
B	median	0.00503	0.00243	***	0.00481	-	***
	mean	2.2597	0.3171		2.1282		
	#stocks	852	418		764		
C	median	0.00686	0.00690	-	0.00369	***	***
	mean	9.1731	2.7175		10.2076		
	#stocks	1238	749		967		
D	median	0.00591	0.00674	-	0.00392	**	***
	mean	0.65114	3.7062		0.46269		
	#stocks	948	494		797		

- MSE distribution very skewed (mean \gg median; usually $>$ 90-th quantile): use quantile regressions
- forecasting improvements after C and D.

Summary statistics: affected stocks

Affected stocks: stocks covered by both brokerages before merger, and covered after merger

		(a)	(b)		(c)		
	Statistic	Pre-merger			Post-merger		
		MSE_{bidder}^{pre}	MSE_{target}^{pre}	(a)=(b)?	MSE^{post}	(c)=(a)?	(c)=(b)?
A	median	0.00089	0.00100	–	0.00129	–	–
	mean	0.04581	0.13950		0.12935		
	#stocks	137					
B	median	0.00079	0.00130	–	0.00325	***	**
	mean	0.07078	0.06969		0.13874		
	#stocks	197					
C	median	0.00151	0.00303	***	0.00176	–	**
	mean	0.15462	0.33878		1.2787		
	#stocks	383					
D	median	0.00104	0.00359	***	0.00178	–	**
	mean	0.02710	0.08364		0.17252		
	#stocks	224					

- Forecast improvements only relative to target brokerage (in Mergers C)