preceding upgrades and net sells preceding downgrades. We interpret these findings as evidence of analysts providing private information to hedge fund traders.

Nevertheless, an investor's aggregate trade imbalance is public information, and therefore is observable to analysts when they make their recommendations. There is some evidence that market participants pay attention to hedge fund trading. Brown and Schwarz (2013) and Wong (2019) found excess trading volume in the week prior to hedge funds filing their Form 13Fs and Form 13Ds, respectively. Therefore, the documented abnormal trading volume by hedge funds prior to the recommendation change could be evidence that analysts change their recommendations after observing a high level of trade imbalances. If this is true, then we would expect the recommendation change and trade imbalances relationship to be strongest for hedge fund trades that are highly visible (i.e., represent a large percentage of the total trading volume); however, we find no evidence that this is the case. In particular, we find no evidence that the highly visible trades by hedge funds (trades that account for 5%, 15%, or 25% of the total CRSP volume) are followed by more new analyst recommendations than other less visible trades. (Results are available upon request.)

CONCLUSIONS

In this article, we examine the information flow between sell-side equity analysts for 11 large brokerage firms and 43 large hedge funds. We posit a quid pro quo exchange of benefits between these market participants. Specifically, we propose that analysts leak upcoming stock recommendation changes to large hedge fund clients in exchange for increased compensation through trading commissions and fees and for higher analyst external ratings. Our data are from 2006 through 2011, a time after the 2003 Global Research Analyst Settlement and stock exchange rules put into place rules intended to curtail opportunistic behavior by sell-side analysts.

We present four main results. First, we show that hedge funds, on average, trade ahead in the direction of stock recommendation changes. Second, we present strong evidence that trade imbalances (net buys or net sales) are positively associated with the upcoming stock recommendation change originating from the hedge fund's prime broker firm. Prime brokers act as clearing houses for hedge fund trades, thus earning commissions for their firms. Prime brokers also earn revenues through lending securities to hedge funds as margin or shorting interests. Thus, we show an association between trade imbalances prior to stock recommendations and analysts' future compensation through their firms' receipt of trading commissions and other revenue streams (Groysberg, Healy, and Maber 2011). Third, we present evidence of a positive link between hedge fund trade imbalances prior to a stock recommendation change, and whether the recommendation originates from a highly ranked analyst, as proxied by II. Stock exchange amendments instituted in 2003 mandate brokerage houses to use an analyst's external ranking as an input in determining the analyst's future compensation. Thus, we present a second link between hedge fund trading on an upcoming recommendation and the issuing analyst's future compensation.

Our article speaks to the difficulties of regulating analyst and hedge fund behavior as it applies to the exchange and use of private information.

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Appendix

Exhibit A1
Definitions of Variables

Variables	Definition
$Trade\ Imbalance_{j,k,-t}$	The number of shares purchased less shares sold on stock *j* by hedge fund *k* on day –*t*, divided by the total number of shares outstanding in the quarter-end preceding day –*t*
$\Delta Rec_{j,0}$	Indicator representing the direction of a sell-side recommendation change on stock *j* for day 0, which is equal to –1 if any analyst in our sample issues a downgrade, +1 for an upgrade, and 0 for no recommendation issued
$10K_{j,-t}$	Indicator variable that takes the value of 1 if a Form 10-K was filed on day –*t*
$10Q_{j,-t}$	Indicator variable that takes the value of 1 if a Form 10-Q was filed on day –*t*
$8K_{j,-t}$	Indicator variable that takes the value of 1 if a Form 8-K was filed on day –*t*
$Quarterly\ Earnings\ Announcement_{j,-t}$	Indicator variable that takes the value of 1 if a quarterly report was announced on day –*t*
$Analyst\ Forecast_{j,-t}$	Indicator variable that takes the value of 1 if any FirstCall analysts issued any earnings forecast on day –*t*
$CAR_{j,lagged}$	Abnormal stock return for firm j over three days prior to day –*t*
$\#News\ Articles_{j,-t}$	The number of relevant news articles (relevant score of ≥75) reported on day –*t* about the underlying firm in RavenPack
$Sentiment_{j,-t}$	The Composite Sentiment Score for the underlying firm on day –*t*, as reported by RavenPack
$Sentiment_{j,lagged}$	The average Composite Sentiment Score for the underlying firm, as reported by RavenPack over the past 90 days
$Prime\ Broker_{k,j}$	Indicator variable that takes the value of 1 if the broker issuing the recommendation is a prime broker for the hedge fund, and zero otherwise
$CAR_{j,0+3}$	Abnormal return on stock *j* for days 0 through +3, where day 0 is the published recommendation date
$All\text{-}Star\text{-}Rank_k$	The ranking given to the analyst by *Institutional Investor* magazine at the time of the analyst recommendation. It takes the value of 3, 2, 1, and 0 if the analyst is ranked 1, 2, or 3, and not ranked, respectively
$Visible_{i,j,k}$	Indicator variable that takes the value of 1 if the trade by the hedge fund on that day is larger than 5%, 15%, or 25% of the total CRSP trading volume
$NewRec_{j,Days[+1,+3]}$	Indicator representing the direction of a sell-side analyst recommendation change on stock j for the three days after day i, which is equal to –1 if any analyst in our sample issues a downgrade, +1 for an upgrade, and 0 for no recommendation issued

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ADDITIONAL READING

Are Emerging Market Equities a Separate Asset Class?
ANTHONY SAUNDERS AND INGO WALTER
The Journal of Portfolio Management
https://jpm.pm-research.com/content/28/3/102

ABSTRACT: *Historically, fund managers and investors making portfolio allocation decisions have considered emerging market equities a separate asset class. More recently, a number of economic, legal, accounting, and financial developments have eroded the root differences between emerging and developed country financial markets. These liberalizations include capital market reforms that have reduced the constraints and limits on foreign portfolio investment. The authors find that empirical evidence strongly supports the view that the world's financial markets are becoming increasingly integrated, and that the integration process encompasses emerging markets. As a result, the idea of a rigid separation between emerging market and developed market pools of investible funds (and adoption of separate performance benchmarks) seems no longer appropriate. Indeed, recent moves by international investors to benchmark their portfolios to MSCI's all–country world index and related world indexes, which include both emerging market and developed market securities, seem a step in this direction.*