Firms' innovation strategy under the shadow of analyst coverage*

Bing Guo,[†] David Pérez-Castrillo,[‡] and Anna Toldrà-Simats[§]

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Abstract

We study the effect of analyst coverage on firms' innovative behavior by considering the different strategies that allow firms to incorporate innovations: internal R&D, investments in corporate venture capital (CVC) funds, and acquisition of other innovative firms. Using data of US firms from 1990 to 2011, we find evidence of two opposite effects of financial analysts. On the one hand, firms followed by more financial analysts are more likely to cut R&D expenses in the future, due to an earnings pressure effect. On the other hand, more analyst coverage increases the likelihood of firms investing in CVC funds and acquiring other innovative firms. We show that this positive effect is mainly a direct effect which we attribute to the monitoring role of financial analysts. We address endogeneity with an instrumental variables approach, and a difference-in-difference strategy where exogenous variation in analyst coverage comes from brokerage house mergers.

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[†] Universidad Carlos III de Madrid. E-mail: bing.guo@uc3m.es.

[‡] Universitat Autònoma de Barcelona and Barcelona GSE. E-mail: david.perez@uab.es.

[§] Universidad Carlos III de Madrid. E-mail: anna.toldra@uc3m.es.

1 Introduction

Long-term growth in revenues and profits depends significantly on firms' investment in innovative activities.[1] However, firms may not invest in innovation in an optimal way. Some distortions arise because the decisions whether and how to invest in innovation are not only affected by their long-term expected effects but also by short-term considerations. Among the factors that may distort firms' incentives to innovate, recent literature has identified the recommendations or reports issued by financial analysts. For instance, He and Tian (2013) find evidence that the market pressure of financial analysts on managers to meet short-term goals leads firms to decrease their innovation in terms of patent output and quality.[2] In a related paper, Bushee (1998) shows that high turnover and momentum trading by institutional investors encourage myopic behavior and lead firms to cut R&D.

The recent literature on the impact of analyst coverage on managerial behavior identifies two main arguments about its overall effect.[3] On the one hand, there is a *monitoring effect*. Analysts are finance and accounting professionals, who act as external monitors of managers (Jensen and Meckling, 1976, Healy and Palepu, 2001, and Dyck, Morse, and Zingales, 2010). They collect information about firms' activities, evaluate their performance, and make forecasts and recommendations to investors. Through these actions, they help reducing the asymmetric information between firms and investors, a problem that is particularly acute for innovation activities (Bhattacharya and Ritter, 1983). By providing information to the market, analyst coverage may increase a CEO's incentives to innovate as it decreases both the undervaluation of the investments in innovation and the firm's exposure to hostile takeovers (Stein, 1988).

On the other hand, there is a *pressure effect*. Missing analyst forecasts is usually punished by investors, which leads managers to focus on short-term achievements (Degeorge, Patel, and Zeckhauser, 1999, Matsunaga and Park, 2001, Bartov, Givoly, and Hayn, 2002, and Hazarika, Karpo, and Nahata, 2012). Since investments in innovation are long-term and high-risk decisions, they usually do not generate short-term income and have a low probability of success. Therefore, managers who are followed by market specialists may have an incentive to cut expenses related to innovation.

[1] See, for instance, the classic work by Schumpeter (1942) and Arrow (1962).

[2] Gentry and Shen (2013) find that managers have a tendency to reduce R&D intensity when performance misses forecasts, but that this tendency is weakened by the level of analyst coverage. Dai, Shen, and Zhang (2015) uncover a similar effect using news coverage.

[3] See He and Tian (2013) for a careful discussion of these two arguments. See also Yu (2009), Hong and Kacperczyk (2010), Litov, Moreton, and Zenger (2012), Irani and Oesch (2013) and (2016), Gentry and Shen (2013), and Chen, Haford, and Lin (2015) for the effect of analyst coverage on several aspects of managerial behavior.

In this paper, we study the effect of analyst coverage on firms' innovative behavior by considering the different strategies that allow firms to incorporate innovations. To this aim, in addition to a firm's internal R&D expenses, we consider its investments in corporate venture capital (CVC) funds and the acquisition of other innovative firms, as alternative channels to obtain new knowledge. Indeed, although in-house R&D is the traditional way in which firms innovate, they also use CVC investments as a window to learn about the latest innovative ideas, and acquisitions of other innovative firms to appropriate knowledge from sources beyond the boundaries of the firm (Cassiman and Veugelers, 2006, and Dushnitsky and Lenox, 2005).

With respect to CVC, anecdotal evidence suggests that CEOs of large and innovative corporations understand the importance of investing in innovation through CVC funds to remain competitive or even increase their market share. An example is Google Ventures, the leader in CVC investments, that currently has $1.5 billion under management, and invested in more than 250 companies since its inception in 2009. Another example is GE Ventures, which recently invested an undisclosed amount into Airware, a startup that builds hardware, software and services for commercial drones.

Similarly, many firms think of acquisitions as a quick way to innovation. For instance, just in 2012, Oracle shelled out $1.92 billion for Taleo (an online recruiting platform), $300 million to acquire Vitrue (an enterprise social marketing platform), and undisclosed sums for Involver (a social media development platform), Collective Intellect (a social media CRM platform), and SelectMinds (social recruiting tools).[4]

We argue that the effect of market watch in general, and analyst coverage in particular, varies across the different activities through which a firm innovates. First, in terms of the monitoring effect, being followed by analysts improves the visibility of any firm's investment in innovation; but the increase in information released to the markets may be smaller for in-house R&D than for CVC investments and acquisitions. Firms need to keep the development of many internal projects secret not to jeopardize their success and to avoid leaking information to competitors. But they have less reasons not to disclose their CVC programs and acquisitions. For instance, Mohamed and Schwienbacher (2016), using a sample of CVC investments made by US public corporations during the 2002–2012 period, find that approximately two-thirds of the investments were publicly announced.

Second, in terms of the pressure effect, analyst coverage may push managers to cut R&D expenses, but the alternative ways of obtaining innovation might be less affected by earn-

[4] Jim Price, University of Michigan, Oct 22, 2012. http://www.businessinsider.com/innovation-through-acquisition-2012-10

ings management. The reason is that, based on General Accepted Accounting Principles (GAAP), all investments in R&D activities are expensed in the income statement, whereas CVC investments and acquisitions are usually capitalized. Thus, increased market pressure is more likely to distort investments in R&D because markets focus on earnings and cutting R&D expenses immediately increases pre-tax earnings. In contrast, it should have a smaller negative impact on acquisitions or CVC because capitalized investments do not affect earnings for every accounting period.[5] The previous arguments suggest that the positive effects of analyst coverage are smaller, while the negative effects are larger, for internal R&D than for CVC and acquisition investments.

We investigate whether and how companies alter the way they allocate resources to innovation activities when faced with investors' scrutiny. Our baseline ordinary least squares (OLS) tests show that firms with more analyst coverage significantly undercut R&D, in agreement with the results obtained in Bushee (1998) concerning the impact of the turnover and momentum trading by institutional investors. Thus, in terms of in-house R&D, the pressure effect of the market seems stronger than its monitoring effect. More interestingly, the tests also show that firms under analyst pressure invest more through their CVC funds and they are more active in the acquisition market. That is, for the external innovation activities, the monitoring effect may dominate.

Analyst coverage is likely to be endogenous because the firm's innovation level may influence the analysts' attention to the firm. In addition, there can be omitted variables influencing both analyst coverage and firms' innovation strategies. To address these endogeneity problems, we use two identification strategies: an instrumental variables (IV) approach, and a difference-in-difference (DID) methodology. For our instrumentation strategy, we follow Yu (2008) and He and Tian (2013), and use the change of brokerage house size as an instrument for analyst coverage. According to Yu (2008), the changes in size of a brokerage house depend on the variations of its profit, which are unrelated to the innovation strategies adopted by the firms that the brokerage house covers. Therefore, the instrument captures exogenous variation in analyst coverage. Our previous OLS results are confirmed by the two-stage least squares (2SLS) analysis.

For our DID estimations we use the merger of analyst brokerage houses as a quasi-natural experiment, in line with Hong and Kacperczyk (2010). These authors show that when two brokerage houses merge, the surviving broker house usually lets go some financial analysts that became redundant after the merger. Hence, the firms that were initially covered by

[5] Acquisitions or CVC investments influence earnings through impairment loss. Such loss exists if the fair value of acquired firms or CVC funds is lower than their costs, which may not happen for every accounting period.

the two broker houses experience a loss in analyst coverage. The validity of this experiment hinges on the idea that the reasons why the two broker houses merged are independent of the characteristics of the firms being covered.[6] We take the list of 15 mergers from Hong and Kacperczyk (2010)[7] and use 13 of these mergers that took place during our sample period. Our group of treated firms are those firms that were covered by the two merging houses before the merger and that continued to be covered by the surviving house afterwards. As a control group we use at first all the rest of firms in Compustat that were active at least three years before and three years after the merger year. In another specification, we find a matched control sample using propensity score matching based on firm-level determinants of treatment. In addition to all these tests, we include a rich set of firm-level controls as well as fixed effects. Our results under both specifications generally confirm our previous results in the OLS and IV regressions.

To confirm that the impact of analyst coverage on a firm's acquisitions is part of the firm's innovation strategy (rather than an empire-building strategy), we analyze the innovativeness of target companies as a function of the number of analysts covering the acquiring firm. We proxy the quality of a target in terms of innovation using the number of accumulated patents and citations up to the moment when it was acquired. Our IV regressions and DID estimations show a positive and significant impact of analyst coverage on the targets' level of innovativeness two or three years ahead.

But firms' innovation activities are not independent from each other. There may be complementarities and/or substitutabilities between internal R&D and external innovation through CVC or acquisition investments. Several authors, including Freeman (1991), Pisano (1991), Arora and Gambardella (1994), Dushnitsky and Lenox (2005), Cassiman and Veugelers (2006), and Kallunki, Pyykkö, and Laamanen (2009) find complementarities between internal and external innovation activities. The generation of internal knowledge through in-house R&D increases a firm's "absorptive capacity," (Cohen and Levinthal, 1989) which improves the return to external knowledge acquisition. Similarly, external know-how may leverage the efficiency of internal R&D activities (Allen, 1986). However, a firm's resources devoted to innovation are limited. The money devoted to one activity cannot be spent in the others and, in this respect, internal and external innovation activities are substitutes. Also, Dessyllas and Hughes (2005) find evidence in favour of the make-or-buy theory that acquisitions are a substitute for internal R&D activity.

We analyze whether the positive effect on CVC and acquisitions is due to a direct moni-

[6] Other authors have used the mergers of borkerage houses for a DID analysis in related research. See for example Irani and Oesch (2013 & 2016), He and Tian (2013), and Chen, Harford, and Lin (2015).

[7] We thank the authors for making this list available.

toring effect of analyst coverage, or to an indirect pressure effect whereby being followed by more analysts leads firms to shift resources from internal R&D to external innovation, i.e., a substitution effect. We study these ideas by introducing interaction effects in our OLS and IV approaches. We find a highly significant positive direct effect of coverage on both CVC and acquisitions one and two years forward, providing support for the monitoring role of financial analysts. Thus, our results highlight that considering the effect of an external factor (in our case, the analyst coverage) on just one of the firm's innovation activities may lead to incomplete results. The pressure effect of analyst coverage has a negative effect on one of the firms' innovation strategies (internal R&D) but the monitoring effect leads to an increase in the external firms' innovation strategies.

Finally, we split our sample as a function of the level of product market competition to confirm the analysts' monitoring role. We show that, although the effects that we have uncovered go in the same direction for firms in lower-competition as for firms in higher-competition industries, they are not only more significant but also stronger for the first group than for the second. Thus, analyst coverage as an external monitoring mechanism may be particularly important for firms in low-competition industries.[8]

The rest of this paper is organized as follows. Section 2 relates our contribution to the literature. Section 3 presents the sample and data. Section 4 presents the baseline results and section 5 the IV and DID results. Section 6 presents evidence on the effect of analyst coverage on the quality of the target. Section 7 studies the monitoring and the pressure effects on CVC and acquisition activities. Section 8 replicates the analyses for firms in low-competition and high-competition industries. Section 9 concludes.

2 Relation to the existing literature

Our paper contributes to several strands of literature. First, we contribute to the emerging literature on finance and innovation. There are relatively few papers that relate innovation to finance. A recent theoretical paper by Manso (2011) shows that the best way to motivate managers to innovate is by offering managerial contracts that tolerate failure in the short run and reward success in the long run. A follow-up paper by Ferreira, Manso, and Silva (2014) suggests that privately held firms are better able to innovate because lower transparency makes insiders more failure tolerant. Empirically, various papers analyze the effects of financial contracting on innovation. Aghion, Van Reenen, and Zingales (2013) show that

[8]Giroud and Mueller (2010) also find that good governance mechanisms are more important for low-competition than for high-competition industries.

dedicated institutional ownership encourages innovation, and Chemmanur, Loutskina, and Tian (2014) study the effects of CVC on innovation. Also, a recent paper by He and Tian (2013) shows that analyst coverage reduces firms' innovation output as measured by patents and citations. We contribute to this literature by studying the effect of analyst coverage on firms' innovation strategy, namely, their choice between internal and external innovation; and by highlighting a positive effect of analyst coverage on innovation.

We also add to the literature that studies the effect of financial markets on managerial myopia. Bushee (1998) finds that managers are more inclined to cut R&D expenses in response to a decrease in earnings, thus engaging in earnings management. He shows that this is more likely to happen when a large portion of institutional owners are non-dedicated (i.e., short-term) investors. A more recent paper by Yu (2008) finds, in contrast, that firms with more analysts manage their accrual based earnings less. Related work by Irani and Oesch (2016) suggests that managers respond to a reduction in analyst coverage by decreasing real earnings management, while increasing accrual manipulation. We focus on the effect of financial analysts on earnings management activities, and their consequence on firms' choice between internal and external innovation.

Our paper also contributes to the literature that studies the influence of financial analysts on firms' decisions. Several papers find a positive influence of financial analysts due to their role as external monitors. Chen, Harford, and Lin (2015) show that following the decrease in coverage shareholders value internal cash holdings less, their CEOs receive higher excess compensation, and they are more likely to engage in value-destroying acquisitions. A related paper by Derrien and Kecskés (2013) shows that a decrease in analyst coverage increases the cost of capital, which results in a decrease in firm investment such as acquisition expenses. These papers, together with the contribution by Yu (2008) mentioned above, provide evidence of the financial analysts' monitoring role.[9] However, other authors show a negative side of financial analysts. Hong and Kacperczyk (2010) find that analysts tend to make overly optimistic earnings forecasts and that more competition among analysts reduces this optimism bias. Also, a survey study by Graham, Harvey, and Rajgopal (2005) finds that analysts impose too much pressure on managers and induce myopic behavior. Finally, the empirical paper by He and Tian (2013) shows that financial analysts impede innovation thus providing evidence of analysts' pressure effect. In our contribution to this literature, we study whether the monitoring or the pressure effects of financial analysts dominate for

[9] Kelly and Ljungqvist (2001), Bradley, Jordan, and Ritter (2003), Irvine (2004), Chang, Dasgupta, and Hilary (2006), and Derrien and Kecskes (2013) also show that, by serving as external monitors, financial analysts have a positive effect on firms' investment and financing decisions, cost of capital, stock prices, liquidity, and valuation.

internal versus external investments in innovation.

Our analysis is also related to Bena and Li (2014), who study whether acquisition decisions are based on the innovative output of acquirers and targets. The authors find that firms with large patent portfolios and low R&D expenses are acquirers, while those with high R&D expenses and slow growth in patents are targets. We contribute to their line of inquiry by studying the effect of analyst coverage on firms' acquisitions of innovative target firms. Finally, our paper relates to the study by Dushnitsky and Lennox (2005) that explores the conditions under which firms are likely to pursue equity investments in new (external) ventures as a way to source innovative ideas, instead of investing in internal R&D. They find that firms invest more in external ventures in industries with weak intellectual property protection and high technological ferment. We advance on this topic by studying the effect of financial market analysts on the internal versus external decision to innovate.

3 Sample selection, variables, and summary statistics

3.1 Sample selection

The sample used in this paper includes information of US public firms for the period 1990 to 2011. We start with all the companies in Compustat during the specified period, and merge these companies with all the information from the rest of databases. We obtain financial analyst information from the Institutional Brokers Estimate Systems (I/B/E/S) database. To determine firms' investments in CVC funds we first collected the CVC funds information from the ThomsonOne private equity database. Since ThomsonOne provides the names of the CVC firms, but these can differ from the actual parent company of the CVC fund, we manually obtain the name of the parent firms using information from Google and the Lexus-Nexus database. We collect information on firms' acquisitions from the Securities Data Company (SDC) Mergers and Acquisitions database. To determine firms' investments in internal R&D, as well as most of our control variables, we use financial statement information from Compustat and stock price information from the Center for Research in Security Prices (CRSP). Our institutional ownership data comes from Thomson's CDA/Spectrum database (form 13F). Finally, we obtain patent and citations information from the National Bureau of Economic Research (NBER) Patent Citation database (Hall, Jaffe, and Trajtenberg, 2001). Following the finance and innovation literature, we exclude financial and utilities firms (SIC between 4000 and 4999 and between 6000 and 6999). Our final sample for the baseline regressions consists of $32,069$ firm-year observations.

3.2 Variable measurement

3.2.1 Proxies for innovation inputs

We identify three main channels that firms can use to invest in innovation. First, firms can invest in internal R&D to increase the share of their earnings dedicated to innovate, or cut R&D to reduce their income dedicated to innovation. We use the dummy variable *R&D Cut,* which is equal to 1 if firms' R&D expenses (scaled by total assets) are lower in the current year than in the previous year, and 0 otherwise. Since firms can cut R&D only if they are actually spending in R&D, we consider only those firm-year observations with positive R&D expenses in all our analysis.[10]

Second, firms can set up CVC funds to invest in startups related to their core business as a way to gain a window to the latest innovations. We define two variables that measure CVC investment. The first one, *CVC Setup,* is a dummy equal to 1 the first year in which the firm invests resources in its CVC fund, and 0 before that. Since this variable is meant to capture firms' decisions to set up a CVC fund, we put a missing value to the firm-years after the firm has made its first investment in start-ups. To further study the influence of financial analysts on CVC investments, we build the dummy variable *CVC Investments*, which is equal to 1 every year a CVC fund invests, and 0 otherwise. This variable captures firms' decisions to make investments in startups subsequently after their CVC fund has been set up.

Finally, firms can acquire other innovative firms to obtain their innovation know-how, their innovative assets, and their patents. We measure firms' acquisition activity based on two variables: *LnAcquisitions* and *Acquisition.* To construct the first variable we first take the raw number of acquisitions as provided on the Securities Data Company (SDC) Mergers and Acquisitions database and set to zero the firm-year observations without available acquisitions information. Then we compute the *LnAcquisitions* variable by taking the natural logarithm of one plus the number of acquisitions according to the previous explanation. The second variable, *Acquisition,* is a dummy equal to 1 if a firm acquires one or more companies in a certain year, and 0 otherwise.

Since we also want to find out whether firms acquire other companies for innovation reasons, we use two variables that are proxies for the innovation volume and quality of acquired firms: *LnTargPatent* and *LnTargCite.* To construct these variables we first retrieve

[10]This, in addition, helps us overcome the fact that some firms might not report their R&D expenditures in their financial statements for strategic reasons. These firms have a missing value for their R&D expenses in the Compustat database. By ommitting them (instead of putting their values to 0), we minimize the bias in the estimated effect.

the target firms from the SDC Mergers and Acquisitions database, and then we manually identify the target firms patents and citations in the patents database. For each target firm, we calculate the accumulated number of patents (i.e., the stock of patents) and the accumulated number of citations (i.e., the stock of citations) of the target firms each year up to the year they are acquired. The variable *LnTargPatent* (*LnTargCite*) measures the number of accumulated patents (citations) on average of all target firms acquired that year. We make some adjustments to these variables due to the nature of the database. Since the NBER patent database only includes patents that were granted, the coverage of the patents filed in the latest years is partial. Therefore, we exclude observations after 2005 in the regressions that require patents or citations information. In addition, the NBER patent database suffers from two types of truncation problems. First, the lag between patent application and patent grants is on average two years but the variation is large. Second, the database ends in 2006. Thus, more recent patents have less time to accumulate citations than patents obtained in earlier years. We address these two problems by using the "time-technology class fixed effect" method (see Hall, Jaffe, and Trajtenberg, 2001, and Atanassov, 2013), that is, by scaling the patents (citations) by the average number of patents (citations) in the same technology class in the same year.

3.2.2 Analyst coverage

Analyst coverage is the main independent variable in our baseline specifications. Following the literature, we compute a raw measure of analyst coverage (*Coverage*) as the mean of the 12 monthly numbers of earnings forecasts that a firm receives annually, from the I/B/E/S summary file. We use this number because most analysts issue at least one earnings forecast for a firm and a majority of them issue at most one earnings forecast each month (He and Tian, 2013).[11] The firm-years with missing information in the I/B/E/S database are not followed by financial analysts. We follow the literature and set to zero the firm-year observations with missing values.[12] Our final measure of analyst coverage is *LnCoverage*, which is the natural logarithm of one plus the raw measure computed before.

[11] There are analysts who make multiple earnings forecasts for a firm in a month. We also construct an analyst coverage variable as the number of unique analysts using the I/B/E/S detail file. Our results are robust to using this variable.

[12] For robustness, we also study the relation between analyst coverage and innovation strategies only for those firms that are followed by at least one analyst. The results will be discussed in the identification section.

3.2.3 Control variables

Following the finance and innovation literature, we control for a rich set of firm and industry characteristics that are likely to affect firms' innovation strategy. The usual control variables are: *Firm Size*, which is the natural logarithm of total assets; *R&D*, which is the R&D expenses scaled by total assets; *Leverage*, which is the ratio of total long-term debt plus total current liabilities divided by total assets; *Cash*, which is firms' cash scaled by total assets; *Profitability*, measured by the return on assets (ROA); *BooktoMkt,* which is the ratio of book value per share divided by the share price; *PPE*, which is firm Property, Plant and Equipment (PPE) scaled by total assets; and *Capex*, which is capital expenditures scaled by total assets. In addition, Bushee (1998) shows that institutional ownership can lead to earnings management practices that can affect innovation; and recent work by Aghion, Van Reenen, and Zingales (2013) and Fang, Tian, and Tice (2014) shows that institutional ownership is likely to affect firms' investment in innovation. Hence, we include the control variable *InstOwn*, which is the percentage of institutional ownership in the firm. Also, Aghion *et al.* (2005) argue that product market competition affects innovation and that the effect may be non-linear. We include the variables *MktShare*, which is a proxy for industry concentration measured as the ratio of firm sales divided by the industry sales, and $MktShare^2$, which is the squared of the previous variable and takes into account possible non-linear effects. Finally, Dushnitsky and Lenox (2005) suggest that firms are more likely to invest in innovation when there are more technological opportunities within their industry. Hence, we include the variable *IndInnov*, which is the natural logarithm of (one plus) the total number of patents in a given 4-digit SIC industry classification in each year.[13] To mitigate the effect of outliers, we winsorize *Leverage*, *Profitability*, and *BooktoMkt* at the 1st and 99th percentiles. A detailed definition of all the variables used in our analysis is provided in Table 1.

3.3 Summary statistics

Table 2 provides summary statistics of all the variables used in our analysis. Firms in our sample are followed, on average, by 6.16 analysts per year. About 46% of firms cut their R&D expenditure on average during our sample period. Also, 0.4% of the firms set up CVC funds in a given year; and around 1.6% invest in start-up companies during the sample period. In terms of acquisitions, 15.2% of firms in the sample are involved in acquisition

[13]We take the natural logarithm of the raw measure of patents because, as usual, the raw measure is highly skewed.

deals in a year and, on average, 0.20 target companies are acquired.[14] Also, for those firms that acquire target firms during our sample period (i.e., 3,680 firm-years in our sample), the accumulated number of patents of targets on average by the average firm is 0.978 and the corresponding number of citations is 3.6.[15] Regarding the rest of variables, firms in our sample have an average size of $2.54 billion (based on the raw variable of *total assets*), an R&D to assets ratio of 11.1%, a leverage ratio of 37.6%, a ratio of cash to assets of 27.4%, a return on assets of −7.06%, a ratio of tangible assets of 19.4%, a ratio of capital expenditures of 4.7%, a proportion of institutional owners of 34.3%, a book to market ratio of 0.46, an average market share of 9.8%, and a given industry has 531 patents on average (based on the raw variable of patents in each industry).

4 Baseline empirical results

We estimate the effect of analyst coverage on firms' innovation strategy. To this end, we start by estimating the following model using ordinary least squares (OLS):

$$Innovation\ Input_{i,t+k} = \alpha + \beta LnCoverage_{i,t} + \gamma Z_{i,t} + \delta_t + \delta_i + \varepsilon_{i,t} \tag{1}$$

where subindexes i stand for firm, and t stand for time. In this model, the dependent variable corresponds to our different measures of firm innovation inputs and it is explained by analyst coverage and a battery of controls. We use several measures for innovation inputs, as described in subsection 3.2.1: *R&D Cut*, which measures a decrease in R&D expenditures; *CVC Setup*, which captures the firm's decision to start investing money through its CVC fund; *CVC Investments*, that is equal to 1 each year in which the firm deploys money from its CVC fund; *Acquisition*, which captures a firm's decision to acquire other companies; and *LnAcquisition*, which measures the number of companies acquired. Our main independent variable is *LnCoverage*, which measures analyst coverage. The rest of independent variables, included in Z, capture firm and industry characteristics, as described in subsection 3.2.3. δ_t and δ_i correspond to *Year* and *Firm* fixed effects respectively. Standard errors are robust to heteroskedasticiy and are clustered at the firm level in all regressions. Since it may take managers more than one year to change their innovation strategy and implement a new one, we examine the effect of analyst coverage on firms' innovation strategy one and two years ahead. Hence, the subindex k can take two values, $k = \{1, 2\}$.

[14]This includes companies that do not acquire. The average number of acquired firms conditional on acquiring is 1.33 and the maximum is 16.

[15]As explained above, these numbers are adjusted for truncation problems.

The OLS regression results are presented in Table 3.[16] Panel A of Table 3 reports the effect of analyst coverage on firms' likelihood of cutting internal R&D, in Panel B we show the effect of coverage on CVC setup and investments, and Panel C includes the coverage effect on firms' acquisition decisions. In the three panels we present several specifications. For each dependent variable, the first two columns report the effect of coverage at t on the innovation strategy at $t+1$, and the next two columns report the effect on the innovation strategy at $t+2$. Moreover, in the regressions in columns (1), (3), (5), and (7) we include only the main dependent variable together with year and firm fixed effects, whereas in columns (2), (4), (6), and (8) we include our full set of controls.

We find that analyst coverage significantly determines firms' innovation strategy. First, the results in Panel A of Table 3 indicate that firms followed by more analysts are more likely to cut R&D expenses in the future, i.e., one and two years ahead. This effect is statistically significant at the 1% level in the regressions with all the controls. The coefficient is either negative or zero when control variables are not included. This suggests that time-varying characteristics affect both the analyst coverage and the R&D expenditure decisions variables, which cause an downward bias in our coefficients in the initial regressions. When including all controls and fixed effects, an increase of one analyst (for a company that initially has one analyst) increases the likelihood of cutting R&D by about 3 percentage points.[17] The results in this panel suggest that, for internal R&D expenditures, the pressure effect of financial analysts dominates the monitoring effect. Indeed, financial market investors expect firms to meet analysts' earnings forecasts. Based on the Generally Accepted Accounting Principles (GAAP), R&D costs are expensed in the income statement directly affecting earnings. Thus, when managers are faced with more analyst pressure, they are more likely to manipulate earnings by cutting in-house R&D spending, i.e., undertaking real earnings management.

In contrast, and as reported in Panel B, more analyst coverage increases the likelihood of firms setting up a CVC fund two years forward, and investing in start-ups one and two years forward. This positive effect is statistically significant at the 5% and the 1% level for *CVC Setup* and *CVC Investments*, respectively. As mentioned in the introduction, firms gain knowledge about the latest innovation ideas and technologies by investing in

[16]Since most of our dependent variables are dummy variables, we conduct a robustness check using a conditional logistic model. We obtain the same results as those obtained with OLS, except for the estimations where the dependent variable corresponds to our two CVC variables. In that case we cannot compute the value of the regression coefficients because the conditional logit model does not converge.

[17]An increase of one analyst represents an increase of 100% for a company that has initially one analyst. The 3 percentage points are computed as follows: $0.043\ln((1+1)/1)=0.0298$. The increase would be smaller for companies with initially more analysts, for example, for an average company (with 6 analysts), an increase by one analyst (i.e. an increase of 17%) increases the likelihood of cutting R&D by 0.67 percentage points.

startups through their CVC funds. Different from R&D expenses, CVC investments are usually capitalized in the balance sheet, thus not affecting current period earnings directly. Moreover, analysts may help publicizing these (positive NPV) investments to the market investors. As a result, investments in CVC reduce firms' exposure to analyst pressure and increase firms' exposure to the analyst monitoring effect. Therefore, being followed by more financial analysts leads firms to set up more CVC funds and invest more in innovative start-ups.

Finally, the results in panel C show that firms followed by more analysts are more likely to acquire other firms, and acquire a larger number of target firms. For both variables, the effect of coverage is significant at the 5% level one and two years forward. Similar to CVC investments, acquisition investments are also capitalized as assets in the balance sheet of the acquirer firms and are usually highly publicized events. Therefore, for acquisition decisions, the monitoring effect may also dominate over the pressure effect of analyst coverage.

With respect to the control variables, firm size, R&D expenditures, cash, institutional ownership, and industry innovativeness seem to be other important determinants of firms' innovation strategies. Larger firms are less likely to cut R&D and more likely to invest in CVC funds. Firms with a larger percentage of institutional owners and those with more cash are also less likely to manipulate earnings through R&D expenditures, and more likely to invest in startups and acquire other firms.[18] This result is consistent with previous works by Bushee (1998), who finds that firms with institutional investors are less likely to cut R&D expenditures, and by Aghion, Van Reenen, and Zingales (2013), who find that institutional investors foster innovation in terms of patent quality and quantity because they alleviate managers' career concerns. Firms with a higher initial level of R&D expenses are more likely to cut R&D but are also more likely to invest in external innovation activities, namely, by setting up CVC funds. Consistently with Dushnitsky and Lenox (2005), industry innovativeness leads firms to set up CVC funds and invest in start-up firms.

5 Identification

This section addresses the possible endogeneity problems present in the coverage-innovation relationship. Both omitted variables and reverse causality could cause a bias in the OLS estimates. An omitted variables problem occurs if for example an unobservable time-varying firm characteristic affects both the innovation inputs and coverage. The usual example is the

[18]The effect of institutional investors on CVC investments is weak in our sample but it is very strong on acquisition activities.

managing style of CEOs, which is difficult to capture with observable characteristics. For instance, managerial propensity for empire building may lead firms to cutting R&D while investing more in CVC and acquisitions. At the same time, empire building managers may attract more analyst coverage because this type of managers enjoys the media attention. Reverse causality might take place if, for example, firms that are more involved in acquisitions attract more analyst coverage due to their higher activity in the M&A market. But the latter problems is attenuated by the fact that our dependent variables are lagged one or two periods with respect to the coverage variable. We address endogeneity problems in two ways: with an instrumental variables approach and using a quasi-natural experiment.

5.1 Instrumental variables approach

We first use instrumental variables (IV) to obtain identification. Our instrument, *Expected Coverage*, was first introduced by Yu (2008) and exploits exogenous variation in analyst coverage.[19] This instrument uses changes in the number of analysts that work for brokerage houses over time. As argued by Yu (2008), the number of analysts that a brokerage house employs depends on the performance or profitability of the broker house; but, in principle, it does not depend on the innovation strategy of the firms it covers. Therefore, a change in analyst following driven by a change in the size of its brokerage houses can be considered as an exogenous variation in analyst coverage.

Following Yu (2008), we construct the instrumental variable using the following equations:

$$ExpCoverage_{i,t,j} = (Brokersize_{t,j}/Brokersize_{0,j}) * Coverage_{i,0,j}, \tag{2}$$

and

$$ExpCoverage_{i,t} = \sum_{j=1}^{n} ExpCoverage_{i,t,j}. \tag{3}$$

$ExpCoverage_{i,t,j}$ is the expected coverage of firm i at year t from brokerage house j. $Brokersize_{t,j}$ and $Brokersize_{0,j}$ are the number of analysts employed by broker j in year t and in the benchmark year 0, respectively. We use year 1990 as the benchmark year because it is the start year of our sample. $Coverage_{i,0,j}$ is the number of analysts from broker j following firm i in year 0. Hence, $ExpCoverage_{i,t,j}$ measures the expected number of analysts from a broker j that can cover a firm i in a given year t according to brokerage house size in that year with respect to the initial year. The instrumental variable $ExpCoverage_{i,t}$ is the total expected coverage of firm i from all the broker houses in year t. We follow the literature and

[19] The instrument has been used in other recent studies like He and Tian (2013), Irani and Oesch (2016), and Harford (2014).

drop all observations in the benchmark year (1990) since expected coverage for that year is one by construction.[20]

We instrument the endogenous variable $LnCoverage_{i,t}$ in model (1) above and we estimate it using two-stage least squares (2SLS). Table 4 presents the results of the IV strategy. Column (1) of Table 4 shows the estimated coefficients of the first-stage regression, where we control for the same variables as in the 2SLS regressions, and also include firm and year fixed effects. Similarly, standard errors are robust and clustered at the firm level. In column (1), the coefficient on the main variable of interest, *ExpCoverage,* is positive and significant at the 1% level, which is consistent with previous work. The large t-statistic (19.1) confirms the explanatory power of our instrument. Also, the F-statistic of the regression is around 405, which is comfortably above the critical value (of 10) suggested by Stock, Wright, and Yogo (2002) for one instrument. Hence, we reject the null hypothesis that the expected coverage is a weak instrument. The rest of columns of Table 4 report the results of the second-stage regressions where the dependent variable corresponds to our different innovation inputs. The IV results are very similar to those obtained using OLS, thus confirming our baseline findings. In the IV regressions the coefficients on the coverage variable tend to be larger, suggesting that endogeneity was biasing the OLS coefficients downwards.[21] Moreover, since our instrument is reasonably exogenous and it has explanatory power, we are now able to establish a causal effect between analyst coverage and firms' innovation strategies. Overall, our results suggest that financial analysts' coverage exerts pressure on managers to meet short-term earnings, which causes firms to cut internal R&D spending, and to increase investments in CVC funds and to acquire other firms.

5.2 Quasi-natural experiment

We use a quasi-natural experiment to further address endogeneity concerns in the coverage-innovation relationship. Specifically, we follow Hong and Kacperczyk (2010) and others[22] and use brokerage house mergers as a source of an exogenous drop in analyst coverage. When two brokerage houses merge, the analysts from the two merging houses that were

[20]As pointed out by Yu (2008), a concern with this instrument is that, after a decrease in the broker house size, the broker house decides which firms to stop covering, which could introduce a selection problem. However, whereas this could pose a problem for the realized coverage, it does not affect the instrument, which measures the tendency to keep covering a firm before any actual termination decision is made.

[21]For example, for our dependent variable R&D cut, the coefficient in the OLS regression is around 0.04 and it becomes 0.06 in the IV. This suggests that an omitted variable might be simultaneously affecting coverage and R&D expenses causing and downward bias. For example, if managerial style is an omitted time-varying firm-level variable, more conservative managers might be more likely to cut R&D expenses, but this type of management also attracts less analyst coverage.

[22]Derrien and Kecskes (2013), Chen, Harford, and Lin (2015), and Irani and Oesch (2013) and (2016).

covering the same firms become redundant. After the merger, the surviving house usually lets go some of these analysts and, as a result, the firms that were followed by the two merging houses before the merger lose one financial analyst after the merger. As shown by Hong and Kacperczyk (2010), this loss in analyst coverage happens for reasons that are exogenous to the characteristics of the firms being covered.[23]

We take the list of 15 mergers provided by Hong and Kacperczyk (2010),[24] and keep 13 of these mergers that occur during our sample period (between 1990 and 2011). Table A.1 shows a detailed list with the characteristics of the mergers used in this study. We use these 13 events to estimate a difference-in-difference (DID) model. We follow Gormley and Matsa (2011) "stacking" approach to construct our sample of treated and control firms. Similar to them, we first construct subsamples, or cohorts, of treated and control firms for each merger event. Thus, each cohort corresponds to a merger event. We construct the cohorts in chronological order by taking into account the treated firms in the previous cohorts (see explanation below), and then we "stack" (or pool) the data across cohorts into one dataset that we will use for estimation.

We construct each cohort as follows. For each merger event, we specify a three-month window around the merger month to account for the possibility that the merger event spanned several days or even a couple of months. Then, we use a 12-month period around this window to construct our group of treated firms. In each cohort, we classify a firm into the treated group if it was covered by both merging houses during the 12-month period before the merger window, that is, between 13 and 2 months before the merger month; and is continued to be covered in the 12-month period after the merger window, that is, between 2 and 13 months after the merger month.[25] For each merger, we construct a comparison group of unaffected firms (firms that were not covered by both houses before the merger) that are present in the Compustat and in I/B/E/S databases during the event window for that merger. We use a 5-year event window (2 years pre- and 2 years post- merger) for our estimations, and hence, we require that our treated and control firms are active in Compustat and have coverage in the I/B/E/S detail file during the 5-year window that corresponds to each merger. For the moment we match firms only based on their presence

[23]In their study, Hong and Kacperczyk (2010) carefully verified that the broker house mergers were exogenous to the covered firms characteristics. Wu and Zang (2009) also argue that when two brokerage houses merge, they typically let analysts go for reasons other than the characteristics of the firms they cover, such as merger turmoil and cultural differences in the broker houses.

[24]Using the list of mergers provided by the authors allows us to make our analysis consistent with the various studies that use the same list, and to be sure that the merger events are due to characteristics that are exogenous to the affected firms.

[25]To further ensure exogeneity, we drop all firms that were covered by both broker houses before the merger but are not covered by the surviving house afterwards as this termination decision could be endogenous.

in Compustat and I/B/E/S during the event window, but below we construct a group of control firms using a matching approach based on firm characteristics.

Since we use data for 2 years pre- and 2 years post- merger for our estimations, we need to address the possibility that some firm-years may overlap across two or more different events. The overlapping could be a problem if for example a firm appears as treated in a given year, and as control in the same year for another event. This could happen for two mergers that occur either in the same year, or are one or two years apart. We address the possibility of overlapping as follows. Our first cohort (i.e., for merger 1 in year 1994) starts with a pool of previously untreated observations.[26] From this pool, we identify the treated firms and control firms as explained above. For the next cohort (i.e., merger 2 in year 1997), we first drop from the pool of treatment and control firm candidates the firms that we identified as treated in the previous merger, and then, from the rest of firms, we identify the treated and control firms for this merger. In general, for each cohort, we drop treated firms from previous mergers as long as the previous mergers are less than four years apart from the current one. In other words, a firm can be a control and remains in the pool of candidate firms until it gets treated by a merger event, in which case it disappears from the sample of candidate firms for the next three years. After the three years, the previously treated firm is put back in the pool of candidates because there is no longer risk of overlap. In the "stacked" sample, we end up with 309 treated firms and $1,888$ control firms.[27]

5.2.1 Difference-in-difference basic estimation

The difference-in-difference approach allows us to exploit the exogenous coverage termination due to mergers, to study the impact of analyst coverage on the innovation strategy of firms. The fact that we have multiple mergers, and therefore cohorts of firms, forces a slight change in the usual DID model. We estimate the following model:

$$y_{ict} = \beta_0 + \beta_1 d_{ict} + \delta_{ct} + \gamma_{ic} + u_{ict} \tag{4}$$

where y is one of our several innovation inputs variables for firm i, in cohort c, and year t; and d_{ict} is an indicator variable that equals 1 if a firm in cohort c is affected by the merger that corresponds to that cohort, after the merger year, and 0 otherwise. That is, for a treated firm affected by a given merger event, this indicator variable changes from 0 to 1

[26]The merger before that occurred in 1988, which is more than 3 years apart from the merger in 1994. So it is not possible that our firm-year observations overlap.

[27]Some observation units will appear multiple times in the data. For example, firm ABC might be a control in event year 1999 but a treated firm in a later event in 2005.

after the merger year. The coefficient β_1 is the DID coefficient and captures the effect of the decrease in analyst coverage after the merger on the innovation strategy of the treated firms relative to control firms. We include firm-cohort fixed effects, γ_{ic}, to ensure that we estimate the impact of treatment after controlling for any fixed differences between firms, and we include year-cohort fixed effects, δ_{ct}, as a non-parametric control for any secular time effects. We allow the firm and year fixed effects to vary by cohort, because this approach is more conservative than including simple fixed effects (although our results are similar with both specifications).[28] Standard errors are robust and clustered at the firm-cohort level to account for potential covariance of outcomes within firms over time.

Since it might take some time after the coverage termination shock for firms to change their innovation strategy, we study the effect of treatment one and two years after the merger event. We measure analyst coverage the year(s) before (after) the merger, as the mean of the 12-month estimates (from the I/B/E/S Summary file) of a firm each year before (after) the merger year. For the rest of the variables (innovation inputs and covariates) employed in our analysis we take their values the year(s) before (after) the merger year, as these variables are measured on an annual basis.

We first make sure that the mergers indeed lead to a decrease in analyst coverage. To this end, we start by estimating the above model using *Coverage* as the dependent variable. Since in the DID approach we study the effect of coverage termination, the *Coverage* measure used in this analysis takes only positive values, i.e., it considers only those firms that are followed by financial analysts according to the I/B/E/S database.[29] Table 5 reports the estimation results.

As the results in Table 5 show, treated firms lose on average about one analyst the first year and second year after the merger relative to firms in the control group. Therefore, the DID coefficients of our regressions in the next tables are capturing the effect of such decrease in coverage.

We now estimate the DID model using our different innovation inputs variables as dependent variables. We report the estimation results in Table 6. Panel A shows the results for the treatment effect taking into account one year before and one year after the merger (i.e., from $t-1$ to $t+1$). In panel B we include one year before the merger and two years

[28]Note that a firm fixed effect corresponds to the variable Treated (equal to 1 for treated firms, and equal to 0 for controls) in the typical DID model, as the two variables are collinear. Similarly for a year fixed effect, which corresponds to the variable Post (equal to 1 after treatment, equal to 0 otherwise).

[29]This is different from our OLS and IV analysis, where we use observations from firms covered by analysts and from firms that are not covered. When we run all our OLS and IV regressions using a dataset with only those firm-years with positive coverage, we find that our results are not sensitive to this change. The results are untabulated and available from the authors.

post-merger (from $t-1$ to $t+2$). Since we first match firms based only on firms' presence in the I/B/E/S and Compustat files, there is a concern that our groups of treated and control firms are ex-ante heterogeneous. We address this concern in two ways. First, in each panel of Table 6, we include the results of two specifications of Equation (4): one including only the main variable of interest, and another one that includes our full set of covariates that accounts for confounding time-varying firm-level characteristics. Second, we employ a matching technique (see below).

Table 6 generally shows that the mergers of brokerage houses have a significant effect on the innovation strategy of firms one and two years after the mergers occur. Specifically, the DID coefficients show that after an exogenous drop in analyst coverage due to the mergers, firms are less likely to cut their R&D expenses, less likely to set up CVC funds, and less likely to acquire other firms. Also, when they do acquire, they acquire less firms. These effects are economically and statistically significant one and two years after the mergers, which is consistent with our OLS and IV results.[30]

5.2.2 Matching

In this section we construct a control group of firms using a matching technique. This approach is useful when one is concerned that the distributions of unobservable characteristics might be substantially different in the treatment and control samples. We match each treated firm to a set of control firms based on various firm-level characteristics measured on the year previous to the merger year. As matching variables, we choose the firm-level characteristics that determine the inclusion of a firm into the treated group. These variables correspond to those used in the literature. We match firms on size, cash, R&D, Profitability, Leverage, PPE, and book-to-market using nearest neighbor propensity score matching. Specifically, we first estimate a logit regression in which the dependent variable equals one if a firm is treated in a given year, and zero otherwise; and the independent variables corre-

[30]In the regressions where the dependent variable corresponds to CVC Setup (columns (3) and (4)), we cannot include firm-cohort fixed effects due to the way in which the variable is defined (see variable definitions in Table 1). Since this variable is set to missing after firms have set up a CVC fund, taking into account the within firm-cohort variation (i.e. including a firm-cohort fixed effect), creates a selection bias because only those firms that set up CVC funds after the merger events (i.e., for which there is no missing data post-merger) are considered when computing the average effect. In other words, the missing data is correlated with the event. To overcome this problem, we replace the firm-cohort fixed effects with the typical dummy variable for treated firms in the standard DID model. The variable *Treated* is equal to 1 for a firm in a cohort affected by the merger, and 0 if the firm is unaffected. This variable is less conservative than our firm-cohort fixed effect (because it imposes the same intercept for all treated and all control firms), but it still captures differences in treated and control firms pre-merger. The coefficient of this variable is untabulated, but it is positive and significant in all regressions suggesting that treated firms are more likely to set up CVC funds pre-merger, relative to control firms.

spond to our set of matching variables. For the logit estimation, we use our panel of treated firms and the rest of firms in Compustat with valid matching variables as our control pool. Second, the estimated coefficients are used to predict propensity scores of treatment, which are then used to perform a nearest-neighbor match with replacement. We keep up to four matches per each treated firm. We end up with 263 treated and 469 control firms.

Table 7 presents a comparison of the ex-ante characteristics of treated and control firms for the matched sample. It shows that the matching procedure eliminates most of the ex-ante differences on firms observable characteristics. We use the matched sample to estimate equation (4) again, and report the results in Table 8. Table 8 shows that analyst coverage significantly affects firms' innovation strategy. In particular, after a coverage termination shock, firms are less likely to cut R&D expenses, to start CVC funds, and to acquire firms. Also, when they acquire, they acquire a lower number of firms. These results are consistent with our OLS and IV results, and the previous DID results. The sign and magnitude of the coefficients in the matched sample (Table 8) are very similar to those in Table 6, suggesting that potential unobservable characteristics were not causing large biases in our roughly matched sample. However, in the matched sample significance is smaller, which might be due to the lower number of observations.

The success of the DID method relies on the so-called parallel trends assumption. This is a key identifying assumption that requires that, in the absence of treatment, the group of treated and control firms follow a similar trend. The fact that we rely on multiple treatment events is useful to mitigate concerns about violation of the parallel trends assumption because it is hard to find a story that would argue that the parallel trends assumption is violated for each unique event. Nevertheless, we look for further support of this assumption by showing that there are no significantly different trends on the pre-event period for the two groups. Figure 1 presents different plots of the point estimates of yearly regressions as specified in Equation (4). Each plot corresponds to various regressions of our innovation input variables against a dummy variable that equals 1 for the treated firms. In each plot we present point estimates by year, from three years before to five years after the merger events. As it can be seen in Figure 1, there is no indication of change in the innovation strategy of treated firms relative to control firms prior to the mergers. However, the change in the treated firms' innovation strategy coincides with the merger event, as shown in our previous results.

6 Acquisition Quality

One of the results in the previous sections is that analyst coverage has a positive effect on firms' likelihood of acquiring other firms and on the number of firms acquired. We argued that firms may acquire other firms to gain access to innovation, and that the monitoring role of financial analysts may encourage firms to invest in external innovative ventures. However, firms may take over other companies not as part of their innovation strategy but as an empire-building strategy.

Recently, Chen, Harford, and Lin (2015) study the effect of analyst coverage on the value of targets chosen by acquiring firms. They measure the target quality using the acquirers' announcement of cumulative abnormal returns (CARs) and the probability of having a negative CAR. They show that firms that experience an exogenous decrease in analyst coverage are more likely to make value-destroying acquisitions. Their result suggests that financial analysts play a role in the choice of targets, and indicates that lower coverage leads managers to choose worse targets.[31]

We further study the influence of analyst coverage on firms' acquisition strategy by focusing on the innovativeness of target companies. We address the question whether the further involvement of firms in acquisition activities when they are followed by more financial analysts is accompanied by an increase in the innovation value of each target or, on the contrary, the number of targets increases at the expense of their average innovation level.

We measure the acquisition quality of each target using its number of accumulated patents and citations up to the moment that it was acquired. The patents and citations of firms reflect not only the quality of the innovation knowledge owned by the firm but also its absorptive capacity and innovation potential. Therefore, if firms acquire with the intention of increasing their innovation capabilities, they should acquire firms with a higher number of patents and citations. In contrast, if acquisitions are made for empire-building reasons, then we should find either no effect or a negative effect regarding the innovation quality of the acquired firms. We use two variables, *LnTargPatent* and *LnTargCite*, that are proxies for the average quality of the targets in terms of innovation. A detailed definition of these variables is provided in Table 1.

We study the influence of financial analysts on firms' acquisition quality using OLS, 2SLS IV, and DID methods for those firms involved in acquisition activities. The main results are reported in Table 9. Panel A states the results for the average targets' patents and Panel B for the average targets' citations. OLS regressions show that firms that are

[31] A related paper by Bena and Li (2014) shows that an important driver of firm acquisitions are the synergies that can be derived from combining the acquirer and target firms' innovation capabilities.

followed by more financial analysts acquire firms of higher innovation quality. However, the effect is not statistically significant. After mitigating possible endogeneity problems discussed in the previous section, both 2SLS IV regressions and DiD estimations show a positive and significant influence from analyst coverage on the targets' average quality for two or three years ahead. The results of Table 9, together with those of Tables 3 and 4, imply that higher analyst coverage encourages firms not only to acquire more, but also more innovative, companies.

7 Monitoring vs. Pressure effect of analyst coverage on outside innovation activities

The previous sections show that analyst coverage leads firms to cutting investments in internal R&D, but to increase investments in start-up companies and to acquire other innovative firms. It seems clear that cutting R&D is the result of financial analyst pressure to meet earnings targets. However, the increase in innovative acquisitions and CVC investments could be due to two different effects. First, it could be due to the monitoring role of analysts. Analysts serve as external monitors of managers and provide reliable information to the market regarding firms' value-enhancing operations. Therefore, firms may have an additional incentive to make profitable investments in CVC and acquisitions when they are followed by more analysts. Second, the increase in the external innovation activities could be due to the analyst pressure effect. Firms are forced to decrease internal R&D to meet analysts' earnings forecasts, and they may compensate to keep up with innovation by acquiring or investing in innovative firms. Thus, the increase in external innovation could be the indirect consequence of a decrease in internal R&D expenses brought by more analyst coverage. In this section we try to uncover whether the increase in acquisitions and CVC investments are mainly due to a direct, monitoring effect or an indirect, pressure effect.

Empirically, we model the direct and indirect effects with an interaction term. We estimate the effect of more analyst coverage followed by a cut in R&D expenditures on external innovation using the following equation:

$$\begin{aligned} External\ Innov_{i,t+k} = \alpha + \beta_1 LnCoverage_{i,t} + \beta_2 R\&D \quad Cut_{i,t+1} \\ + \beta_3 (LnCoverage_t * R\&D \quad Cut_{i,t+1}) + \gamma Z_{i,t} + \lambda_t + \lambda_i + \varepsilon_{i,t} \end{aligned} \tag{5}$$

where subindex i stands for firm, t stands for time, and k can take two values $k = \{1, 2\}$.

The dependent variable *External Innov* corresponds to our proxies for external innovation activities: CVC (*CVC Setup* and *CVC Investments*), and acquisitions (*Acquisition* and *LnAcquisitions*). The coefficient β_1 captures the direct effect of financial analysts on external innovation, and the coefficient β_3 captures the indirect effect. According to our previous discussion, we expect the coefficient β_1 to be positive if analysts have a monitoring role that encourages firms to undertake value-enhancing acquisitions and CVC investments. We expect coefficient β_3 to be positive if analyst pressure leads managers to increase external R&D activities, either to compensate for the reduction in internal innovation or because resources for innovation become available after cutting internal R&D. Alternatively, β_3 can be negative if firms also cut external innovation investments after cutting internal R&D due to analyst pressure because with a smaller in-house R&D unit firms are less able to leverage the advantages of investing in external innovation. The coefficient β_2 captures the relationship between internal R&D and external innovation for firms that cut R&D and have zero coverage. We use the same set of covariates as in the baseline model and also include firm and year fixed effects. Errors are robust and clustered at the firm level. Like before, we estimate Equation (5) using both OLS and IV.

We present the results in Table 10. Panel A presents the results for CVC investments, Panel B the results for acquisitions, and Panel C the results for acquisition quality. In all panels, columns (1) to (4) present the results of the OLS tests and columns (5) to (8) those of the IV. Also in both panels, columns (1), (3), (5), and (7) show the direct and indirect effects of coverage on innovation outputs one year forward, and the rest of columns show the effects two years forward.

Panel A shows that analyst coverage has a positive direct effect on CVC setup and CVC investments one and two years forward, especially in IV estimations. This effect is highly significant and confirms a positive direct effect of financial analysts, which can be attributed to their monitoring role. The coefficient on the interaction term is negative in all IV specifications, and significant at the 10% level in the last specification. This gives some evidence of an indirect effect of analyst coverage related to market pressure, which leads firms to reduce investments in CVC after cutting internal R&D. We note that only the direct effect is relevant for firms that do not cut R&D after an increase in the number of analysts that follow them, and our results imply that they are more likely to invest in CVC activities. For firms that cut R&D both the direct and the indirect effects play a role. Although the effects go in opposite directions, the first one is stronger and the total effect of coverage on the set-up and investment of CVC funds is also positive.

Panel B shows that analyst coverage also has a positive direct effect on the decision to acquire other firms and on the number of firms acquired. This effect is positive and highly significant in all regressions, which gives further support for the monitoring role of financial analysts. The coefficient of the interaction effect is negative in all the specifications, and appears significant in the IV estimations for two periods forward, which also provides support for a pressure effect of analyst coverage. Still, the interaction coefficient is significantly smaller in absolute terms than the coefficient for the direct effect. Therefore, firms that cut R&D after an increase in analyst coverage increase their acquisition activity, although to a lesser extend than firms that do not cut R&D.

Panel C reports the results for the quality of acquisitions. All the direct and indirect effects are positive, and the indirect effect is very significant in the IV regressions for two periods forward. This is true for both the number of patents and the number of citations. These results indicate that the quality of the acquired companies increases for those firms with more analyst coverage that as a result cut their R&D expense. Therefore, these results together with those in panel B, suggest that while the monitoring effect leads to an increase in acquisitions, the pressure effect leads to an improvement in the innovation quality of the targets.

Overall, our results indicate that the positive effect of analyst coverage on CVC and acquisitions is more related to the direct impact of the analysts' actions than to an indirect effect due to the decrease in internal R&D. With respect to innovation quality, the indirect pressure effect seems to be the main driver. Hence, even if our results also provide support for a dark side of analyst coverage that discourages investment in internal innovation for earnings management reasons, we provide evidence of a bright side that encourages innovation. Although both effects might be present for internal and external innovation, the monitoring effect dominates for the intensity of CVC and acquisitons, whereas the pressure effect dominates for in-house R&D and acquisition quality.

The results in this section also allow us to contribute to the discussion whether internal and external innovation activities are complements or substitues.[32] In our specification, for a given level of coverage, the total effect of cutting R&D on external innovation is given by $\beta_2 + \beta_3 * LnCoverage$. If this term is positive (negative) internal and external innovation activities are substitutes (complements). We find that the two innovation channels are substitutes (complements) for low (high) coverage firms.

[32] See Dushnitsky and Lennox (2005), Cassiman and Veugelers (2006), and Kallunki, Pyykkö, and Laamanen (2009).

8 Product market competition

Previous studies indicate that firms' innovation strategies are influenced by product market competition (Roberts, 1999). For example, Aghion *et al.* (2005) show that the relationship between product market competition and innovation is an inverted-U shape. Additionally, the effect of analyst coverage may also depend on the degree of market competition. Recently, Chen, Harford, and Lin (2015) find that firms experiencing an exogenous decrease in analyst coverage have a worse corporate governance system, but that the effect is statistically significant only in the less competition subsample.[33]

In the previous section we argued that the main driver of the firms' change in innovation strategy concerning CVC and acquisitions is the monitoring role of financial analysts. According to the papers mentionned above, this monitoring role should be stronger in less competitive markets. To check whether this is true, we reestimate our major results by partitioning the sample into more and less competitive industries. Product market competitiveness is measured by firms' market shares (*MktShare*). Table 11 reports the results for the two subsamples, using the sample median of the variable *MktShare* as threshold for low and high market competition.[34] To save space, we suppress in the table the estimated coefficients of the control variables, which are similar to those in the baseline regressions.

As Table 11 shows, the sign of most of the estimated coefficients of *LnCoverage* is the same for both groups as in Tables 3 and 4, where the full sample of firms is considered. However, there are noteworthy differences between the two groups in the significance and magnitude of the coefficients in the instrumental variables regressions. The effect of analyst coverage is much more significant for firms in lower-competition than for firms in higher-competition markets. The coefficients for the regressions involving CVC and acquisition decisions one period forward are much larger for the first group, indicating that the monitoring effect is not only more significant but also larger in terms of magnitude for firms in lower-competition industries. Therefore, since we know that corporate governance is weaker in less competitive markets (Chen *et al.*, 2015), the results in this section provide further support for the monitoring role of financial analysts.

[33]This result is aligned with theoretical models, which predict that product market competition reduces managerial slack (Jensen and Meckling, 1976), and with empirical papers showing that firms in noncompetitive industries benefit more from good governance mechanisms that do firms in competitive industries (Giroud and Mueller, 2010).

[34]Unreported regressions using the mean of *MktShare* as threshold yield similar results.

9 Conclusion

In this paper, we study the effect of analyst coverage on the three main innovation strategies by firms: internal R&D, investment in Corporate Venture Capital, and acquisition of other innovative firms. We hypothesize that the pressure effect of the financial analysts, which pushes for a reduction in the innovation activities, may be weaker for the external innovation activities than for in-house R&D. At the opposite, the positive monitoring effect may be stronger for the external innovation strategies. Our results confirm the hypothesis. We find evidence that firms followed by more financial analysts are more likely to cut their internal R&D programs but they are also more likely to start or increase CVC investments and to acquire other innovative firms.

Our results confirm findings by Bushee (1998) who shows, using turnover and momentum trading by institutional investors, that the pressure effect of the market seems stronger than the monitoring effect for internal R&D. However, our broader analysis of the effect of the market on several innovation strategies puts Bushee's (1998) results in perspective: while an increase in market pressure (due, in our analysis, to an increase in the number of financial analysts) leads to more cuts in internal R&D, the accompanying increase in market monitoring leads to an increase in the external innovation activities.

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Table 1: **Variable Definitions**

Variables	**Definitions**
Innovation	
R&D Cut	Indicator variable equal to 1 if R&D (scaled by total assets) at $t+1$ is lower than that at t, and 0 otherwise
CVC Setup	Indicator variable equal to 1 the year in which CVC fund makes its first investment, and 0 for the years preceding the first investment
CVC Investments	Indicator variable equal to 1 for each year in which CVC fund invests in a start-up, and 0 otherwise
Acquisition	Indicator variable equal to 1 when a firm acquires one or more other companies, and 0 otherwise
LnAcquisitions	Natural logarithm of (one plus) the number of target companies acquired
LnTargPatent	Natural logarithm of (one plus) the accumulated number of patents on average of all target firms acquired
LnTargCite	Natural logarithm of (one plus) the accumulated number of citations on average of all target firms acquired
Analyst Coverage	
LnCoverage	Natural logarithm of (one plus) the arithmetic mean of the 12 monthly number of earnings forecasts obtained from financial analysts
Control Variables	
Firm Size	Natural logarithm of total assets at the end of the fiscal year
R&D	R&D expenses divided by book value of total assets
Leverage	Firm's long-term debt plus total current liabilities divided by book value of total assets
Cash	Cash at the end of fiscal year divided by book value of total assets
Profitability	Return on assets ratio (ROA) at the end of the fiscal year
PPE	Property, plant & equipment (PPE) divided by book value of total assets
Capex	Capital expenditure divided by book value of total assets
InstOwn	Average institutional ownership percent for a firm
BooktoMkt	Book value per share divided by the share price
MktShare	Sales revenue scaled by sales of four-digit standard industrial classification (SIC) code
$MktShare^2$	Squared market share
IndInnov	Natural logarithm of (one plus) total number of patents in an industry according to four-digit SIC

Table 2: **Summary Statistics.** This table reports the descriptive statistics for variables of our main regressions based on the sample of U.S. public firms from 1990 to 2011.

Variable	25th percentile	Median	Mean	75th percentile	Std. Dev.	No. of Obs.
R&D Cut	0.000	0.000	0.455	1.000	0.498	32,069
CVC Setup	0.000	0.000	0.004	0.000	0.061	29,208
CVC Investments	0.000	0.000	0.016	0.000	0.127	32,069
Acquisition	0.000	0.000	0.152	0.000	0.359	32,069
NumofAcquisitions	0.000	0.000	0.203	0.000	0.573	32,069
TargPatent	0.000	0.000	0.978	0.000	28.290	3,680
TargCite	0.000	0.000	3.606	0.000	81.311	3,680
Coverage	1.000	3.75	6.163	8.500	7.095	32,069
Firm Size	4.175	5.438	5.606	6.920	2.034	32,069
R&D	0.021	0.062	0.111	0.136	0.152	32,069
Leverage	0.199	0.349	0.376	0.501	0.232	32,069
Cash	0.054	0.187	0.274	0.436	0.260	32,069
Profitability	−9.652	2.902	−7.060	7.771	29.097	32,069
PPE	0.076	0.156	0.194	0.273	0.154	32,069
Capex	0.019	0.035	0.047	0.061	0.045	32,069
InstOwn	0.000	0.273	0.343	0.642	0.336	32,069
BooktoMkt	0.204	0.376	0.463	0.633	0.477	32,069
MktShare	0.001	0.010	0.098	0.073	0.205	32,069
$MktShare^2$	0.000	0.000	0.052	0.005	0.167	32,069
IndInnov	0.693	4.248	3.772	6.163	2.794	32,069

Table 3: **Analyst Coverage and Innovation Strategies (OLS Results).** This table reports the OLS regression results of the effect of analyst coverage on different innovation strategies one and two years ahead. Robust standard errors clustered at firm level are in parentheses. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively. Definitions of variables are in Table 1.

Panel A: Analyst Coverage and R&D Activities

Dependent variable	*R&D Cut*			
	(1)	(2)	(3)	(4)
	$t+1$	$t+1$	$t+2$	$t+2$
LnCoverage	−0.014**	0.043***	0.000	0.028***
	(0.006)	(0.008)	(0.006)	(0.008)
Firm Size		−0.071***		−0.033***
		(0.008)		(0.007)
R&D		0.889***		0.489***
		(0.055)		(0.050)
Leverage		−0.046**		−0.052**
		(0.023)		(0.021)
Cash		−0.195***		−0.025
		(0.027)		(0.026)
Profitability		0.000		0.001***
		(0.000)		(0.000)
PPE		0.246***		0.111**
		(0.057)		(0.055)
Capex		0.001		0.328***
		(0.099)		(0.099)
InstOwn		−0.045**		−0.093***
		(0.022)		(0.020)
BooktoMkt		−0.021**		0.008
		(0.009)		(0.009)
MktShare		0.127		0.147
		(0.140)		(0.146)
$MktShare^2$		−0.110		−0.115
		(0.128)		(0.138)
IndInnov		0.009**		0.009**
		(0.004)		(0.004)
Constant	0.461***	0.590***	0.452***	0.447***
	(0.019)	(0.044)	(0.019)	(0.043)
Year fixed effect	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes
No. of observations	32,069	30,881	32,069	30,881
R^2	0.100	0.140	0.110	0.121

Panel B: Analyst Coverage and CVC Funds

Dependent variable	*CVC Setup*				*CVC Investments*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$t+1$	$t+1$	$t+2$	$t+2$	$t+1$	$t+1$	$t+2$	$t+2$
LnCoverage	0.003***	0.001	0.003***	0.001**	0.012***	0.010***	0.010***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)
Firm Size		0.004***		0.003***		−0.001		−0.008***
		(0.001)		(0.001)		(0.003)		(0.003)
R&D		0.002		0.006**		−0.003		−0.002
		(0.002)		(0.003)		(0.008)		(0.008)
Leverage		−0.001		0.002		−0.011*		−0.005
		(0.002)		(0.002)		(0.007)		(0.006)
Cash		−0.006*		−0.004		−0.017**		−0.010
		(0.003)		(0.002)		(0.008)		(0.008)
Profitability		−0.000**		−0.000		−0.000		0.000***
		(0.000)		(0.000)		(0.000)		(0.000)
PPE		0.002		0.003		0.015		0.040**
		(0.004)		(0.003)		(0.017)		(0.018)
Capex		−0.011		−0.012*		−0.019		−0.015
		(0.009)		(0.007)		(0.020)		(0.021)
InstOwn		−0.001		−0.001		0.008		0.014*
		(0.002)		(0.002)		(0.008)		(0.009)
BooktoMkt		−0.000		−0.000		−0.001		0.001
		(0.001)		(0.000)		(0.002)		(0.002)
MktShare		−0.013		−0.005		0.084		0.106
		(0.017)		(0.012)		(0.072)		(0.080)
$MktShare^2$		0.016		0.003		−0.068		−0.088
		(0.016)		(0.010)		(0.067)		(0.081)
IndInnov		0.001***		0.001***		0.008***		0.008***
		(0.000)		(0.000)		(0.001)		(0.001)
Constant	−0.011***	−0.026***	−0.010***	−0.025***	−0.006	−0.034**	0.003	−0.010
	(0.002)	(0.005)	(0.002)	(0.005)	(0.005)	(0.017)	(0.005)	(0.017)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observtaions	29,208	29,208	28029	28,029	32,069	32,069	30,881	30,881
R^2	0.396	0.397	0.360	0.361	0.307	0.311	0.309	0.313

Panel C: Analyst Coverage and Acquisition

Dependent variable	*Acquisition*				*LnAcquisitions*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$t+1$	$t+1$	$t+2$	$t+2$	$t+1$	$t+1$	$t+2$	$t+2$
LnCoverage	0.024***	0.013**	0.007	0.012**	0.021***	0.010**	0.006	0.010**
	(0.005)	(0.006)	(0.005)	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)
Firm Size		0.003		−0.021***		0.005		−0.017***
		(0.005)		(0.006)		(0.005)		(0.005)
R&D		0.006		−0.033		0.003		−0.029
		(0.021)		(0.023)		(0.017)		(0.019)
Leverage		−0.086***		−0.072***		−0.077***		−0.061***
		(0.015)		(0.015)		(0.013)		(0.013)
Cash		0.147***		0.082***		0.116***		0.064***
		(0.020)		(0.019)		(0.017)		(0.016)
Profitability		0.001***		0.000**		0.000***		0.000***
		(0.000)		(0.000)		(0.000)		(0.000)
PPE		0.028		0.047		0.020		0.046
		(0.037)		(0.038)		(0.030)		(0.032)
Capex		−0.077		−0.019		−0.093*		−0.052
		(0.060)		(0.063)		(0.048)		(0.051)
InstOwn		0.052***		0.039**		0.044***		0.037***
		(0.018)		(0.017)		(0.015)		(0.015)
BooktoMkt		−0.041***		−0.031***		−0.036***		−0.027***
		(0.005)		(0.005)		(0.004)		(0.004)
MktShare		0.158		0.205		0.170		0.179
		(0.133)		(0.139)		(0.121)		(0.126)
$MktShare^2$		−0.103		−0.112		−0.096		−0.088
		(0.122)		(0.129)		(0.108)		(0.117)
IndInnov		0.003		−0.001		0.003		−0.000
		(0.003)		(0.003)		(0.003)		(0.003)
Constant	0.043***	0.035	0.097***	0.191***	0.027**	0.014	0.072***	0.148***
	(0.012)	(0.032)	(0.013)	(0.034)	(0.011)	(0.028)	(0.012)	(0.030)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	32,069	32,069	30,881	30,881	32,069	32,069	30,881	30,881
R^2	0.241	0.250	0.234	0.239	0.276	0.284	0.269	0.273

Table 4: **Analyst Coverage and Innovation Strategies (IV 2SLS Results).** This table reports the first-stage and the second-stage 2SLS regression results, based on the instrumental variable expected coverage, of the effect of analyst coverage on different innovation strategies one and two years ahead. Robust standard errors clustered at firm level are in parentheses. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively. Definitions of variables are in Table 1.

	First-stage	**Second-stage**									
Dependent variable	*LnCoverage*	*R&D Cut*		*CVC Setup*		*CVC Investments*		*Acquisition*		*LnAcquisitions*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	t	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
ExpCoverage	0.374***										
	(0.020)										
LnCoverage		0.059**	0.057**	0.009**	0.008***	0.048***	0.042***	0.069***	0.052**	0.072***	0.048***
(Instrumented)		(0.029)	(0.028)	(0.003)	(0.003)	(0.013)	(0.013)	(0.022)	(0.021)	(0.019)	(0.017)
Firm Size	0.411***	−0.077***	−0.044***	0.000	−0.000	−0.019***	−0.021***	−0.022**	−0.039***	−0.023***	−0.035***
	(0.012)	(0.014)	(0.014)	(0.002)	(0.001)	(0.006)	(0.006)	(0.011)	(0.011)	(0.009)	(0.009)
R&D	0.491***	0.895***	0.499***	−0.003	0.002	−0.025**	−0.020*	−0.028	−0.055**	−0.034*	−0.051**
	(0.052)	(0.054)	(0.048)	(0.003)	(0.003)	(0.010)	(0.010)	(0.023)	(0.025)	(0.019)	(0.020)
Leverage	−0.185***	−0.037	−0.049**	0.000	0.003	−0.005	0.001	−0.076***	−0.066***	−0.066***	−0.055***
	(0.035)	(0.023)	(0.022)	(0.002)	(0.002)	(0.007)	(0.007)	(0.015)	(0.015)	(0.013)	(0.013)
Cash	0.070*	−0.192***	−0.024	−0.006**	−0.004**	−0.020**	−0.011	0.146***	0.076***	0.115***	0.060***
	(0.038)	(0.026)	(0.025)	(0.003)	(0.002)	(0.008)	(0.008)	(0.019)	(0.018)	(0.017)	(0.015)
Profitability	−0.000	0.000	0.001***	−0.000*	−0.000	0.000	0.000***	0.001***	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PPE	0.307***	0.240***	0.096*	−0.002	0.000	0.004	0.026	0.012	0.032	0.004	0.035
	(0.085)	(0.057)	(0.055)	(0.004)	(0.003)	(0.017)	(0.017)	(0.037)	(0.038)	(0.030)	(0.031)
Capex	0.662***	0.006	0.319***	−0.014	−0.015**	−0.041*	−0.032	−0.110*	−0.028	−0.132***	−0.068
	(0.122)	(0.098)	(0.097)	(0.009)	(0.007)	(0.022)	(0.023)	(0.062)	(0.063)	(0.050)	(0.052)
InstOwn	0.446***	−0.058**	−0.106***	−0.005**	−0.005**	−0.007	0.001	0.028	0.023	0.018	0.021
	(0.044)	(0.024)	(0.023)	(0.002)	(0.002)	(0.009)	(0.010)	(0.019)	(0.019)	(0.017)	(0.016)
BooktoMkt	−0.075***	−0.018**	0.010	0.000	0.001	0.002	0.003	−0.038***	−0.028***	−0.033***	−0.024***
	(0.012)	(0.009)	(0.009)	(0.001)	(0.000)	(0.002)	(0.002)	(0.005)	(0.005)	(0.004)	(0.004)
MktShare	−0.401	0.103	0.151	−0.017	−0.010	0.080	0.106	0.146	0.169	0.153	0.139
	(0.255)	(0.139)	(0.147)	(0.016)	(0.011)	(0.073)	(0.078)	(0.133)	(0.133)	(0.119)	(0.120)
$MktShare^2$	0.144	−0.094	−0.111	0.022	0.009	−0.055	−0.087	−0.084	−0.093	−0.072	−0.062
	(0.223)	(0.127)	(0.139)	(0.016)	(0.010)	(0.069)	(0.075)	(0.123)	(0.124)	(0.108)	(0.111)
IndInnov	0.019***	0.008**	0.008**	0.000*	0.001***	0.008***	0.007***	0.002	−0.001	0.002	−0.000
	(0.006)	(0.003)	(0.003)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)
Constant	−1.521***	1.549***	0.273**	−0.022**	−0.003	0.045	0.164***	0.039	0.340***	0.037	0.303***
	(0.132)	(0.089)	(0.122)	(0.010)	(0.012)	(0.040)	(0.052)	(0.068)	(0.094)	(0.060)	(0.077)
Year fixed effect	*Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	*Yes*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observaions	31,037	31,073	29,885	28,291	27,112	31,073	29,885	31,073	29,885	31,073	29,885
R^2	0.862	0.143	0.126	0.419	0.362	0.306	0.306	0.250	0.243	0.283	0.278

Table 5: **Difference-in-Difference Effect on Analyst Coverage** This table shows the results of estimating equation (4) using *Coverage* as the dependent variable. *Coverage* is a raw measure that corresponds to the mean of the 12 monthly numbers of earnings forecasts for firm i at time t, extracted from the I/B/E/S summary file. The regressions in columns (1) and (2) report the effect of the brokerage house mergers (the DID effect) on the average coverage of treated firms relative to control firms, one and two years after the mergers respectively. Both regressions include firm-cohort and year-cohort fixed effects, as well as robust standard errors clustered at the firm-cohort level. Coefficients significant at the 10%, 5% and 1% level are marked with $*$, $**$, and $***$ respectively.

Dependent variable	*Coverage (t+1)*	*Coverage (t+2)*
	(1)	(2)
DID effect	-0.905^{***}	-1.36^{***}
	(0.386)	(0.341)
Firm-cohort FE	Yes	Yes
Year-cohort FE	Yes	Yes
No. of observations	22,811	33,583
R^2	0.94	0.92

Table 6: **Difference-in-Difference Effect on Innovation Strategies.** This table shows the effect of coverage termination on our various proxies for innovation inputs, namely, *R&D cut*, *CVC Setup*, *CVC Investments*, *Acquisition*, and *LnAcquisitions*. The variable *DID effect* captures the effect of a decrease in analyst coverage on the firms affected by the mergers of brokerage houses after they were affected relative to unaffected firms. Panel A shows the effect of a decrease in analyst coverage on the innovation strategy of firms one year after the merger events, and panel B shows the same effect two years after the mergers. In both panels, we run two specifications for each dependent variable. The first specification includes only the *DID effect*, and the second one includes also our usual set of controls. We include firm-cohort and year-cohort fixed effects in all regressions, except for the regressions concerning *CVC Setup* in which we include year-cohort fixed effects. In the *CVC Setup* regressions we include a dummy variable that equals 1 when a firm is affected by a given merger, and 0 otherwise. We do this because this variable causes some sample bias by construction (see explanation in section 5.2.1). Robust standard errors are clustered at the firm-cohort level. Coefficients significant at the 10%, 5% and 1% level are marked with $*$, $**$, and $***$ respectively. Definitions of variables are in Table 1.

Panel A

Dependent variable	*R&D Cut*		*CVC Setup*		*CVC Investments*		*Acquisition*		*LnAcquisitions*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)	(*t+1*)
DID effect	−0.115**	−0.112**	−0.032*	−0.031*	0.015	0.015	−0.074*	−0.065	−0.115***	−0.108***
	(0.051)	(0.050)	(0.017)	(0.017)	(0.025)	(0.025)	(0.041)	(0.041)	(0.040)	(0.040)
Firm Size		0.014		0.011***		0.031***		0.090***		0.075***
		(0.021)		(0.001)		(0.007)		(0.015)		(0.014)
R&D		−0.732***		−0.007		0.018		0.171***		0.146***
		(0.100)		(0.004)		(0.019)		(0.049)		(0.040)
Leverage		0.100**		−0.003		−0.005		−0.049		−0.06**
		(0.05)		(0.003)		(0.016)		(0.036)		(0.03)
Cash		0.12*		0.022***		−0.002		−0.204***		−0.211***
		(0.07)		(0.004)		(0.02)		(0.05)		(0.04)
Profitability		0.002***		−0.000***		−0.000		−0.000		−0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
PPE		−0.82***		−0.042***		−0.045		−0.261**		−0.326***
		(0.15)		(0.007)		(0.036)		(0.105)		(0.086)
Capex		−0.49**		0.119***		−0.026		−0.194		−0.099
		(0.22)		(0.019)		(0.046)		(0.149)		(0.117)
InstOwn		−0.06		−0.008***		−0.006		0.122**		0.105***
		(0.06)		(0.003)		(0.015)		(0.049)		(0.04)
BooktoMkt		−0.000		0.000***		−0.000		−0.000		−0.000
		(0.0)		(0.00)		(0.00)		(0.00)		(0.00)
MktShare		−0.47		−0.069***		−0.049		−1.127***		−0.704*
		(0.46)		(0.014)		(0.10)		(0.391)		(0.36)
MktShare^2		−0.02		0.056***		0.031		1.019***		0.698*
		(0.41)		(0.014)		(0.09)	(0.358)		(0.359)	
IndInnov		0.02		0.001**		0.002		0.019*		0.019*
		(0.01)		(0.001)		(0.003)		(0.011)		(0.01)
Constant	0.481***	0.624***	−0.004**	−0.060***	0.042***	−0.147***	0.168***	−0.306***	0.144***	−0.251***
	(0.025)	(0.165)	(0.002)	(0.006)	(0.002)	(0.045)	(0.025)	(0.118)	(0.017)	(0.107)
Firm-cohort FE	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year-cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	22,811	22,811	20,864	20,864	22,811	22,811	22,811	22,811	22,811	22,811
R^2	0.512	0.542	0.009	0.030	0.784	0.786	0.635	0.641	0.668	0.674

Panel B

Dependent variable	*R&D Cut*		*CVC Setup*		*CVC Investments*		*Acquisition*		*LnAcquisitions*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)	(*t+2*)
DID effect	−0.119***	−0.115***	−0.038**	−0.038**	−0.004	−0.003	−0.067**	−0.057*	−0.102***	−0.094***
	(0.039)	(0.038)	(0.015)	(0.015)	(0.018)	(0.018)	(0.031)	(0.032)	(0.031)	(0.03)
Firm Size		0.049***		0.01***		0.031***		0.105***		0.095***
		(0.016)		(0.001)		(0.005)		(0.01)		(0.009)
R&D		−0.59***		−0.002		0.036***		0.095**		0.09***
		(0.120)		(0.003)		(0.013)		(0.04)		(0.03)
Leverage		0.151***		−0.004*		−0.015*		−0.031		−0.04**
		(0.056)		(0.002)		(0.009)		(0.022)		(0.018)
Cash		0.226***		0.018***		−0.024*		−0.189***		−0.20***
		(0.046)		(0.003)		(0.013)		(0.03)		(0.027)
Profitability		0.002***		−0.000***		−0.000		−0.000***		−0.000**
		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)
PPE		−0.845***		−0.037***		−0.046**		−0.33***		−0.35***
		(0.112)		(0.005)		(0.023)		(0.06)		(0.05)
Capex		−0.55***		0.102***		−0.03		−0.09		−0.06
		(0.153)		(0.015)		(0.04)		(0.08)		(0.07)
InstOwn		−0.083**		−0.007***		−0.019*		0.069**		0.056**
		(0.041)		(0.002)		(0.01)		(0.031)		(0.026)
BooktoMkt		−0.00		0.00***		−0.00		−0.00		−0.00
		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)
MktShare		−0.578*		−0.06***		0.007		1.03***		−0.664***
		(0.313)		(0.012)		(0.073)		(0.238)		(0.211)
$MktShare^2$		0.128		0.05***		0.008		0.938***		0.657***
		(0.294)		(0.01)		(0.066)		(0.211)		(0.199)
IndInnov		0.007		0.001***		0.004***		0.012*		0.011**
		(0.009)		(0.00)		(0.002)		(0.006)		(0.006)
Constant	0.557***	0.477***	−0.004**	−0.055***	0.034***	−0.146***	0.201***	−0.329***	0.168***	−0.307***
	(0.013)	(0.123)	(0.002)	(0.005)	(0.001)	(0.030)	(0.024)	(0.075)	(0.017)	(0.065)
Firm-cohort FE	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year-cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	33,583	33,583	30,500	30,500	33,583	33,583	33,583	33,583	33,583	33,583
R^2	0.340	0.382	0.009	0.028	0.718	0.720	0.487	0.496	0.531	0.541

Table 7: **Ex-ante Firm Characteristics (Matched Sample)** This table reports the average values and standard errors, as well as the mean difference and t-statistic of the treated and control groups of firms in the matched sample one year before the merger event. We report the averages and difference for various firm characteristics included in our analysis. We match firms on size, cash, R&D, Profitability, Leverage, PPE, and book-to-market using nearest neighbor propensity score matching. $***$, $**$, and $*$ indicate significance at the 1%, 5%, and 10% level, respectively. Definitions of variables are in Table 1.

	Control group	*Treated group*	
	Mean (Std. Err.)	Mean (Std. Err.)	Difference (t-stat)
Firm Size	7.00 (0.05)	7.68 (0.07)	-0.68^{***} (−6.9)
R&D	0.07 (0.004)	0.06 (0.003)	0.008 (1.11)
Leverage	0.39 (0.007)	0.41 (0.009)	−0.016 (−1.2)
Cash	0.20 (0.008)	0.17 (0.011)	0.02 (1.43)
Profitability	4.68 (0.6)	5.81 (0.52)	−1.12 (−1.05)
PPE	0.26 (0.006)	0.268 (0.009)	−0.008 (−0.77)
Capex	0.063 (0.001)	0.064 (0.002)	−0.001 (−0.42)
InstOwn	0.38 (0.011)	0.37 (0.01)	0.01 (0.5)
BooktoMkt	0.309 (0.009)	0.305 (0.01)	0.004 (0.28)
MktShare	0.183 (0.009)	0.184 (0.01)	−0.001 (−0.079)
IndInnov	5.24 (0.08)	5.52 (0.10)	-0.28^{**} (−2.09)

Table 8: **Difference-in-Difference Effect on Innovation Strategies (Matched Sample).** This table shows the difference-in-difference estimates of equation (4) using the matched sample. The dependent variable corresponds to our various measures of innovation inputs. Panel A reports the effect of coverage termination one year after the merger, and panel B reports the effect up to two years after. The DID effect is an indicator variable that equals 1 for firms affected by a given merger after the merger event, and 0 otherwise. All regressions include firm-cohort and year-cohort fixed effects. Errors are robust and grouped at the firm-cohort level. Coefficients significant at the 10%, 5% and 1% level are marked with $*$, $**$, and $***$ respectively. Definitions of variables are in Table 1.

Panel A

Dependent variable	*R&D cut*	*CVC Setup*	*CVC Invesments*	*Acquisition*	*LnAcquisitions*
	(1)	(2)	(3)	(4)	(5)
	(t+1)	*(t+1)*	*(t+1)*	*(t+1)*	*(t+1)*
DID effect	−0.087	−0.033	0.000	−0.075	−0.090**
	(0.064)	(0.020)	(0.028)	(0.050)	(0.045)
Firm-cohort FE	Yes	No	Yes	Yes	Yes
Year-cohort FE	Yes	Yes	Yes	Yes	Yes
No. of observations	2,120	1,709	2,120	2,120	2,120
R^2	0.508	0.038	0.778	0.655	0.693

Panel B

Dependent variable	*R&D cut*	*CVC Setup*	*CVC Invesments*	*Acquisition*	*LnAcquisitions*
	(1)	(2)	(3)	(4)	(5)
	(t+2)	*(t+2)*	*(t+2)*	*(t+2)*	*(t+2)*
DID effect	−0.084*	−0.038**	−0.018	−0.073*	−0.079**
	(0.048)	(0.019)	(0.000)	(0.039)	(0.035)
Firm-cohort FE	Yes	No	Yes	Yes	Yes
Year-cohort FE	Yes	Yes	Yes	Yes	Yes
No. of observations	3,180	2,530	3,180	3,180	3,180
R^2	0.348	0.033	0.771	0.606	0.632

Table 9: **Analyst Coverage and Acquisition Quality** This table reports OLS, 2SLS IV and difference-in-difference (DID) regression results of analyst coverage on acquisition quality at one, two and three years ahead. Acquisition quality is measured with average number of patents of target firms in Panel A and with average number of citations in Panel B. Robust standard errors clustered at firm level are in parentheses. Coefficients significant at the 10%, 5% and 1% level are marked with $*$, $**$, and $***$ respectively. Definitions of variables are in Table 1.

Panel A: Patents

Dependent variable	*LnTargPatent*								
		OLS			2SLS IV			DID	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$t+1$	$t+2$	$t+3$	$t+1$	$t+2$	$t+3$	$t+1$	$t+2$	$t+3$
LnCoverage	0.058	0.061	0.001	0.220	0.633*	−0.035			
	(0.053)	(0.062)	(0.071)	(0.415)	(0.359)	(0.105)			
R&D	0.144	0.048	−0.286	−0.039	−0.471	−0.048			
	(0.505)	(0.389)	(0.361)	(0.489)	(0.431)	(0.138)			
Firm Size	−0.037	−0.064	−0.020	−0.105	−0.340*	−0.017			
	(0.058)	(0.053)	(0.051)	(0.195)	(0.176)	(0.050)			
Leverage	0.061	0.015	−0.215	0.076	0.166	−0.010			
	(0.167)	(0.194)	(0.208)	(0.167)	(0.200)	(0.058)			
Cash	−0.021	0.001	0.010	−0.079	0.083	0.035			
	(0.203)	(0.156)	(0.183)	(0.164)	(0.150)	(0.050)			
Profitability	−0.000	0.000	0.000	−0.000	0.001	−0.000			
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)			
PPE	−0.264	0.441	0.484	−0.380	−0.034	0.154			
	(0.525)	(0.535)	(0.580)	(0.545)	(0.581)	(0.124)			
Capex	0.181	−0.758	−1.340	0.223	−1.193*	−0.197			
	(0.872)	(0.730)	(0.867)	(0.706)	(0.678)	(0.198)			
InstOwn	0.254	0.333**	0.279	0.145	−0.040	0.023			
	(0.164)	(0.157)	(0.178)	(0.292)	(0.268)	(0.084)			
BooktoMkt	0.028	0.092	−0.006	0.028	0.161**	−0.015			
	(0.085)	(0.075)	(0.076)	(0.068)	(0.072)	(0.025)			
MktShare	0.047	−0.532	−0.140	−0.292	−0.044	0.135			
	(1.190)	(1.210)	(1.334)	(0.958)	(0.988)	(0.280)			
$MktShare^2$	−0.157	0.292	−0.398	0.314	0.117	−0.152			
	(1.247)	(1.283)	(1.377)	(1.094)	(1.052)	(0.250)			
IndInnov	0.061	0.043	0.059	0.071*	0.037	0.019*			
	(0.050)	(0.049)	(0.049)	(0.043)	(0.042)	(0.010)			
Constant	−0.087	0.250	−0.035	−0.340	0.358	0.500***			
	(0.315)	(0.334)	(0.342)	(0.465)	(0.470)	(0.127)			
DID effect							−0.182	−0.193	−0.277*
							(0.268)	(0.308)	(0.167)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3,680	3,564	3,417	3,607	3,465	3,322	864	864	1,663
R^2	0.400	0.399	0.398	0.404	0.369	0.459	0.787	0.792	0.647

Panel B: Citations

Dependent variable	LnTargCite								
		OLS			2SLS IV			DID	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	$t+1$	$t+2$	$t+3$	$t+1$	$t+2$	$t+3$	$t+1$	$t+2$	$t+3$
LnCoverage	0.089	0.100	0.011	0.147	0.662	0.699*			
	(0.078)	(0.086)	(0.096)	(0.578)	(0.491)	(0.386)			
R&D	0.483	0.377	−0.355	0.328	−0.216	−0.778			
	(0.866)	(0.642)	(0.542)	(0.801)	(0.629)	(0.526)			
Firm Size	−0.041	−0.101	−0.031	−0.063	−0.374	−0.363*			
	(0.089)	(0.078)	(0.074)	(0.270)	(0.239)	(0.200)			
Leverage	0.169	0.152	−0.289	0.139	0.291	−0.087			
	(0.255)	(0.303)	(0.312)	(0.246)	(0.300)	(0.295)			
Cash	−0.067	0.048	−0.006	−0.168	0.116	−0.012			
	(0.304)	(0.237)	(0.271)	(0.242)	(0.216)	(0.219)			
Profitability	0.000	0.001	0.000	−0.000	0.001	0.001			
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)			
PPE	−0.434	0.574	0.371	−0.463	0.090	0.087			
	(0.730)	(0.707)	(0.796)	(0.741)	(0.754)	(0.760)			
Capex	0.062	−0.835	−1.495	0.225	−1.332	−1.858			
	(1.263)	(1.051)	(1.463)	(1.035)	(0.940)	(1.281)			
InstOwn	0.353	0.468**	0.405*	0.298	0.097	−0.102			
	(0.228)	(0.218)	(0.243)	(0.409)	(0.368)	(0.318)			
BooktoMkt	−0.005	0.156	−0.024	−0.010	0.226**	0.039			
	(0.128)	(0.109)	(0.118)	(0.101)	(0.101)	(0.105)			
MktShare	−0.449	−0.833	−0.681	−0.947	−0.312	−0.393			
	(1.748)	(1.658)	(1.817)	(1.360)	(1.284)	(1.520)			
$MktShare^2$	0.393	0.728	0.094	0.972	0.520	0.278			
	(1.782)	(1.728)	(1.814)	(1.494)	(1.364)	(1.527)			
IndInnov	0.095	0.074	0.081	0.106*	0.069	0.091			
	(0.068)	(0.065)	(0.064)	(0.056)	(0.055)	(0.056)			
Constant	−0.112	0.216	0.065	−0.701	0.118	0.412			
	(0.504)	(0.485)	(0.491)	(0.674)	(0.639)	(0.633)			
DID effect							−0.343	−0.363	−0.405*
							(0.378)	(0.262)	(0.229)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3,680	3,564	3,417	3,607	3,465	3,322	864	1,286	1,663
R^2	0.410	0.415	0.415	0.417	0.404	0.405	0.790	0.674	0.618

Table 10: **Monitoring vs. Pressure Effects** This table reports both OLS and 2SLS IV regression results of the interaction effect of analyst coverage and R&D Cut on CVC investments, on acquisition activities, and on acquisition quality one and two years ahead. Robust standard errors clustered at firm level are in parentheses. Coefficients significant at the 10%, 5% and 1% level are marked with ∗, ∗∗, and ∗ ∗ ∗ respectively. Definitions of variables are in Table 1.

Panel A: CVC

	OLS				2SLS IV			
Dependent variable	*CVC Setup*		*CVC Investments*		*CVC Setup*		*CVC Investments*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.000	0.001	0.010***	0.012***	0.009***	0.008***	0.050***	0.046***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.004)	(0.003)	(0.013)	(0.013)
R&D Cut	−0.001	0.001	−0.001	−0.002	0.002	0.002	0.003	0.011*
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.007)	(0.007)
InteractR&D	0.001	0.000	0.001	0.001	−0.001	−0.001	−0.003	−0.008*
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.005)
R&D	0.001	0.005**	−0.003	−0.001	−0.004	0.001	−0.025***	−0.022***
	(0.002)	(0.003)	(0.008)	(0.008)	(0.003)	(0.003)	(0.010)	(0.010)
Firm Size	0.004***	0.003***	−0.001	−0.008***	0.001	−0.000	−0.019***	−0.022***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.001)	(0.006)	(0.006)
Leverage	−0.001	0.002	−0.011*	−0.005	0.000	0.003	−0.005	0.001
	(0.002)	(0.002)	(0.007)	(0.006)	(0.002)	(0.002)	(0.007)	(0.007)
Cash	−0.005*	−0.003	−0.017**	−0.010	−0.006**	−0.004*	−0.020**	−0.010
	(0.003)	(0.002)	(0.008)	(0.008)	(0.003)	(0.002)	(0.008)	(0.008)
Profitability	−0.000**	−0.000	−0.000	0.000***	−0.000*	−0.000	0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PPE	0.002	0.003	0.015	0.040**	−0.002	−0.000	0.004	0.027
	(0.004)	(0.003)	(0.017)	(0.018)	(0.004)	(0.003)	(0.017)	(0.017)
Capex	−0.011	−0.012*	−0.020	−0.015	−0.014	−0.015**	−0.040*	−0.032
	(0.009)	(0.007)	(0.020)	(0.021)	(0.009)	(0.007)	(0.022)	(0.023)
InstOwn	−0.001	−0.001	0.008	0.014*	−0.005**	−0.005**	−0.007	0.000
	(0.002)	(0.002)	(0.008)	(0.009)	(0.002)	(0.002)	(0.009)	(0.010)
BooktoMkt	−0.000	0.000	−0.001	0.001	0.000	0.001	0.002	0.003
	(0.001)	(0.000)	(0.002)	(0.002)	(0.001)	(0.000)	(0.002)	(0.002)
MktShare	−0.012	−0.006	0.084	0.106	−0.017	−0.010	0.080	0.106
	(0.017)	(0.012)	(0.072)	(0.080)	(0.016)	(0.011)	(0.073)	(0.078)
$MktShare^2$	0.016	0.004	−0.068	−0.088	0.022	0.009	−0.056	−0.087
	(0.016)	(0.011)	(0.067)	(0.081)	(0.016)	(0.010)	(0.069)	(0.076)
IndInnov	0.001**	0.001***	0.008***	0.008***	0.000*	0.001***	0.008***	0.007***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Constant	−0.026***	−0.026***	−0.034**	−0.009	−0.023**	−0.004	0.046	0.161***
	(0.005)	(0.005)	(0.017)	(0.017)	(0.010)	(0.012)	(0.040)	(0.052)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	29,208	27,998	32,069	30,848	28,291	27,083	31,073	29,854
R^2	0.397	0.361	0.311	0.313	0.419	0.362	0.306	0.305

Panel B: Acquisitions

	OLS				2SLS IV			
Dependent variable	*Acquisition*		*LnAcquisitions*		*Acquisition*		*LnAcquisitions*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.014**	0.013**	0.011**	0.010*	0.072***	0.057***	0.074***	0.053***
	(0.006)	(0.006)	(0.004)	(0.004)	(0.022)	(0.022)	(0.019)	(0.018)
R&D Cut	0.038***	0.023***	0.031***	0.018***	0.042***	0.042***	0.036***	0.037***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.013)	(0.013)	(0.012)	(0.011)
InteractR&D	−0.005	−0.004	−0.003	−0.002	−0.009	−0.018**	−0.008	−0.016**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.009)	(0.008)	(0.007)	(0.007)
R&D	−0.023	−0.049**	−0.021	−0.042**	−0.057**	−0.074***	−0.058***	−0.068***
	(0.021)	(0.023)	(0.018)	(0.019)	(0.004)	(0.004)	(0.003)	(0.004)
Firm Size	0.006	−0.019***	0.007	−0.016***	−0.020*	−0.037***	−0.021**	−0.033***
	(0.005)	(0.006)	(0.005)	(0.005)	(0.011)	(0.011)	(0.009)	(0.009)
Leverage	−0.085***	−0.071***	−0.076***	−0.061***	−0.075***	−0.066***	−0.065***	−0.055***
	(0.015)	(0.015)	(0.013)	(0.013)	(0.015)	(0.015)	(0.013)	(0.013)
Cash	0.153***	0.085***	0.121***	0.066***	0.153***	0.080***	0.12***	0.064***
	(0.020)	(0.019)	(0.017)	(0.016)	(0.020)	(0.018)	(0.017)	(0.015)
Profitability	0.001***	0.000**	0.000***	0.000**	0.001***	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
PPE	0.021	0.041	0.014	0.041	0.006	0.029	−0.001	0.032
	(0.037)	(0.039)	(0.030)	(0.032)	(0.037)	(0.038)	(0.030)	(0.031)
Capex	−0.076	−0.019	−0.093*	−0.052	−0.109*	−0.026	−0.131***	−0.067
	(0.060)	(0.063)	(0.048)	(0.051)	(0.062)	(0.063)	(0.050)	(0.052)
InstOwn	0.053***	0.040**	0.045***	0.038**	0.029	0.023	0.019	0.021
	(0.018)	(0.017)	(0.015)	(0.015)	(0.019)	(0.019)	(0.017)	(0.016)
BooktoMkt	−0.040***	−0.031***	−0.036***	−0.027***	−0.037***	−0.028***	−0.033***	−0.024***
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
MktShare	0.154	0.204	0.166	0.179	0.144	0.168	0.151	0.139
	(0.132)	(0.139)	(0.121)	(0.126)	(0.133)	(0.133)	(0.119)	(0.120)
$MktShare^2$	−0.100	−0.111	−0.094	−0.088	−0.082	−0.092	−0.070	−0.063
	(0.122)	(0.129)	(0.108)	(0.116)	(0.123)	(0.124)	(0.107)	(0.111)
IndInnov	0.003	−0.001	0.003	−0.000	0.001	−0.001	0.001	−0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Constant	0.014	0.177***	−0.004	0.136***	−0.006	0.316***	−0.001	0.284***
	(0.032)	(0.035)	(0.028)	(0.030)	(0.069)	(0.094)	(0.060)	(0.078)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	32,069	30,848	32,069	30,848	31,073	29,854	31,073	29,854
R^2	0.251	0.239	0.285	0.274	0.251	0.243	0.285	0.279

Panel C: Acquisition Quality

Dependent variable	OLS				2SLS IV			
	LnTargPatent		*LnTargCite*		*LnTargPatent*		*LnTargCite*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.056	0.025	0.082	0.053	0.213	0.476	0.140	0.467
	(0.064)	(0.068)	(0.093)	(0.095)	(0.421)	(0.347)	(0.584)	(0.475)
R&D Cut	−0.007	−0.085	−0.025	−0.094	−0.049	−0.410**	−0.024	−0.474**
	(0.105)	(0.083)	(0.160)	(0.118)	(0.176)	(0.169)	(0.241)	(0.232)
InteractR&D	0.005	0.073	0.013	0.094	0.023	0.234***	0.014	0.286**
	(0.057)	(0.048)	(0.083)	(0.067)	(0.094)	(0.089)	(0.125)	(0.120)
R&D	0.142	−0.020	0.489	0.255	−0.017	−0.405	0.330	−0.188
	(0.532)	(0.408)	(0.908)	(0.672)	(0.489)	(0.433)	(0.808)	(0.635)
Firm Size	−0.037	−0.063	−0.041	−0.098	−0.108	−0.320*	−0.063	−0.347
	(0.060)	(0.054)	(0.091)	(0.079)	(0.202)	(0.179)	(0.278)	(0.239)
Leverage	0.062	0.026	0.170	0.169	0.078	0.174	0.141	0.303
	(0.166)	(0.193)	(0.254)	(0.302)	(0.167)	(0.200)	(0.246)	(0.300)
Cash	−0.021	0.012	−0.068	0.069	−0.083	0.049	−0.170	0.086
	(0.203)	(0.157)	(0.304)	(0.237)	(0.159)	(0.147)	(0.236)	(0.212)
Profitability	−0.000	0.000	0.000	0.001	−0.000	0.001	−0.000	0.002
	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
PPE	−0.267	0.434	−0.438	0.557	−0.384	0.021	−0.468	0.142
	(0.522)	(0.537)	(0.733)	(0.708)	(0.537)	(0.575)	(0.735)	(0.744)
Capex	0.182	−0.726	0.060	−0.778	0.207	−1.117	0.223	−1.212
	(0.873)	(0.733)	(1.266)	(1.050)	(0.715)	(0.680)	1.047)	(0.939)
InstOwn	0.254	0.339**	0.353	0.477**	0.143	−0.010	0.299	0.139
	(0.163)	(0.156)	(0.227)	(0.217)	(0.297)	(0.266)	(0.415)	(0.366)
BooktoMkt	0.028	0.094	−0.006	0.160	0.027	0.150**	−0.010	0.215**
	(0.084)	(0.074)	(0.128)	(0.109)	(0.068)	(0.071)	(0.101)	(0.099)
MktShare	0.045	−0.567	−0.456	−0.880	−0.305	−0.173	−0.956	−0.474
	(1.194)	(1.228)	(1.754)	(1.687)	(0.963)	(0.995)	(1.367)	(1.307)
$MktShare^2$	−0.156	0.335	0.397	0.789	0.327	0.222	0.980	0.654
	(1.248)	(1.292)	(1.783)	(1.748)	(1.096)	(1.053)	(1.499)	(1.380)
IndInnov	0.061	0.040	0.095	0.069	0.072*	0.036	0.105*	0.066
	(0.051)	(0.049)	(0.069)	(0.066)	(0.043)	(0.042)	(0.057)	(0.055)
Constant	−0.084	0.288	−0.096	0.256	−0.297	0.521	−0.684	0.309
	(0.326)	(0.336)	(0.525)	(0.489)	(0.515)	(0.491)	(0.741)	(0.669)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	3,680	3,559	3,680	3,559	3,607	3,460	3,607	3,460
R^2	0.400	0.401	0.410	0.417	0.404	0.373	0.417	0.406

Table 11: **Low vs. High Market Competition** We partition our sample into two subsamples: firms operating in low competition industries and firms operating in high competition industries. This table reports both OLS and 2SLS IV regression results of each subsample using the sample median of the market share $MktShare$ as a threshold. Robust standard errors clustered at firm level are in parentheses. Coefficients significant at the 10%, 5% and 1% level are marked with $*$, $**$, and $***$ respectively.

	Low Competition				High Competition			
	OLS		2SLS IV		OLS		2SLS IV	
Dependent variable	*R&D Cut*		*R&D Cut*		*R&D Cut*		*R&D Cut*	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.025**	0.019	0.075**	0.087**	0.059***	0.039***	0.082	0.076
	(0.012)	(0.012)	(0.037)	(0.038)	(0.011)	(0.011)	(0.067)	(0.056)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	16,129	15,463	15,474	14,808	15,940	15,418	15,599	15,077
R^2	0.137	0.128	0.139	0.131	0.188	0.150	0.190	0.154
	OLS		2SLS IV		OLS		2SLS IV	
Dependent variable	*CVC Setup*		*CVC Setup*		*CVC Setup*		*CVC Setup*	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.001	0.001	0.014***	0.010**	0.000	0.002**	0.001	0.008**
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)	(0.004)	(0.004)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	13,905	13,288	13,317	12,700	15,303	14,741	14,974	14,412
R^2	0.328	0.355	0.369	0.337	0.528	0.435	0.533	0.462
	OLS		2SLS IV		OLS		2SLS IV	
Dependent variable	*CVC Investments*		*CVC Investments*		*CVC Investments*		*CVC Investments*	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.009*	0.010	0.049***	0.040**	0.002	0.006***	0.016	0.028**
	(0.005)	(0.006)	(0.016)	(0.018)	(0.002)	(0.002)	(0.014)	(0.014)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	16,129	15,463	15,474	14,808	15,940	15,418	15,599	15,077
R^2	0.332	0.340	0.334	0.338	0.386	0.368	0.388	0.363
	OLS		2SLS IV		OLS		2SLS IV	
Dependent variable	*Acquisition*		*Acquisition*		*Acquisition*		*Acquisition*	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.010	0.005	0.103***	0.054*	0.011	0.014*	−0.001	0.070*
	(0.009)	(0.009)	(0.029)	(0.029)	(0.007)	(0.007)	(0.038)	(0.040)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	16,129	15,463	15,474	14,808	15,940	15,418	15,599	15,077
R^2	0.253	0.245	0.251	0.251	0.284	0.264	0.286	0.261
	OLS		2SLS IV		OLS		2SLS IV	
Dependent variable	*LnAcquisitions*		*LnAcquisitions*		*LnAcquisitions*		*LnAcquisitions*	
	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$	$t+1$	$t+2$
LnCoverage	0.006	0.003	0.100***	0.048**	0.008	0.011*	0.004	0.056*
	(0.008)	(0.008)	(0.026)	(0.024)	(0.006)	(0.006)	(0.032)	(0.033)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	16,129	15,463	15,474	14,808	15,940	15,418	15,599	15,077
R^2	0.296	0.287	0.294	0.295	0.306	0.287	0.309	0.285

A Appendix

Table A.1: **Description of the Merger Events.** This table reports a description of the merger events considered in this paper. The details were compiled from Hong and Kacperczyk (2010). We include the names and dates of the merging brokerage houses as well as their I/B/E/S identifiers.

Brokerage House Name	*I/B/E/S Identifier*	*Acquirer/Target*	*Merger Date*
Paine Webber Group, Inc.	189	Acquirer	12/31/1994
Kidder Peabody & Co.	150	Target	
Morgan Stanley Group, Inc.	192	Acquirer	5/31/1997
Dean Witter Discover & Co.	232	Target	
Smith Barney	254	Acquirer	11/28/1997
Salomon Brothers	242	Target	
EVEREN Capital Corp.	829	Acquirer	1/9/1998
Principal Financial Securities	495	Target	
DA Davidson & Co.	79	Acquirer	2/17/1998
Jensen Securities Co.	932	Target	
Dain Rauscher Corp.	76	Acquirer	4/6/1998
Wessels Arnold & Henderson LLC	280	Target	
First Union Corp., Charlotte, NC	282	Acquirer	10/1/1999
EVEREN Capital Corp.	829	Target	
Paine Webber Group, Inc.	189	Acquirer	6/12/2000
JC Bradford & Co.	34	Target	
Credit Suisse First Boston	100	Acquirer	10/15/2000
Donladson Lufkin & Jenrette	86	Target	
UBS Warburg Dillon Read	85	Acquirer	12/10/2000
Paine Webber	189	Target	
Chase Manhattan	125	Acquirer	12/31/2000
JP Morgan	873	Target	
Fahnestock & Co.	98	Acquirer	9/18/2001
Josephthal Lyon & Ross	933	Target	
Janney Montgomery Scott LLC	142	Acquirer	3/22/2005
Parker / Hunter Inc.	860	Target	

Figure 1: **Effect of Merger Events on Innovation Inputs.** This figure includes several graphs that report the point estimates from regressions of our various innovation inputs on a dummy variable equal to 1 for firms that were affected by brokerage house mergers and 0 otherwise. The regressions follow the same specification as Equation (4) except that each point estimate corresponds to a different year, from 3 years before a merger event to 5 years after. We also include 95% confidence intervals.