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Media Bias in Financial Newspapers: Evidence from Early-Twentieth-Century France

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Abstract

The financial market was well developed in France in the years before World War I, and there were many newspapers that provided information to investors. Yet commentators at the time faulted the financial press for inaccuracy and biases, which they linked to the existence of payments made by companies for coverage in the editorial section. This paper tests whether the payment scheme induced a systematic bias in the coverage of companies listed on the Paris stock exchanges by newspapers. The results show that, although firms' media coverage was affected, the performance of firms actually touted by the press was good. Thus, the media bias can also be explained by newspapers choosing the companies' exposures according to their editorial policy.

Keywords*: *Media coverage, newspapers, media bias, financial markets
JEL Classifications*: *G11, G12, L15, O16, N13

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1. Introduction

Among the key elements in the development of financial markets are the quantity and quality of information provided to investors on financial assets and on their issuers. The French financial market experienced remarkable growth during the first wave of globalization, from 1870 to the start of World War I) (Rajan and Zingales 2003). Consequently, about two m investors held at least some of the several thousand stocks and bonds listed on the Paris stock exchanges (Neymarck 1911).[1] Although newspapers were a unique medium for spreading financial information with 'hundreds of living titles' (Albert 1972, p. 261), most observers writing at the time pointed to the dearth of informational content offered by the financial press (Lysis 1912; Kaufmann 1914). They linked this lack of information to payments made by the providers of the information, which clearly constituted a distinct feature of this media market.[2] They blamed this for creating a conflict of interest and, ultimately, for biasing the information published. Calling such arrangements *bribery* and decrying the *venality* of the French press, they further argued that 'in our society, those who have money have the newspapers and consequently, the public opinion' (Lysis 1912, p. 168).

Most historians (see, e.g., Feis 1930; Albert 1972) subsequently went along with the assumption that these periodicals contained little valuable information. A closer look at this market, however, indicates that countervailing forces could have been at work. Leroy-Beaulieu (1906, p. 251), who edited *L'Économiste Français*, pointed out that there did exist sincere and fair newspapers. Albert (1972) wrote that 'a reliable financial press did nonetheless exist although their independence of thought could have been questioned'. Martin (2006) discussed the so-called venality of the press and judged that the phenomenon could have been overestimated by commentators at the time, whose negative assessments, moreover, were completely accepted by historians.

Although payments were part of the standard publication contract, the idea that newspapers slanted information still needs to be proved. After all, a newspaper was also paid by its readers and thus was unlikely to act against its own interests without suffering some loss of credibility. More precisely, from the literature on two-sided markets, we borrow the idea that an intermediary can set up a payment structure requiring that both sides (information providers and readers) pay to cover the operating cost. Consequently, the mere existence of payments to newspapers by information providers does not, in itself, prove information distortion. Rather, the effect on editorial policy of such payments is an empirical question that needs quantitative assessment. In this paper, we construct a quantitative test to assess whether the coverage of firms listed on the Paris stock exchanges was biased toward paying firms in a sample of financial periodicals.[3] The test allows us to distinguish the coverage explained by the firms' financial performance or readers' preferences from the coverage linked to

[1] Leroy-Beaulieu (1906, p. 62) cited 3,000 securities.
[2] McMillan and Zoido (2004) documented a similar feature in the current news market in Peru.
[3] In the political context, D'Alessio and Allen (2000) defined three types of media bias: the *gatekeeping bias*, which is the preference for selecting stories from one (political) party or the other; the *coverage bias*, which considers the relative amounts of coverage each party receives; and the *X bias*, which focuses on the favorability of coverage.

payments made to newspapers. We show that payments did bias the distribution of published information toward paying firms but that this did not necessarily have a negative impact on readers. The conclusion is therefore that the *corruption* of the media was over-emphasized and that the quality of the supply of news must have helped to sustain the development of the financial markets.

Few papers study the historical aspects of the dissemination of financial information. Some focused on the effect of the dissemination of price lists in newspapers before the Industrial Revolution and argued that this facilitated arbitrage (Neal 1988; McCusker and Gravesteijn 1991; Flandreau et al. 2009). Flandreau (2003) is related to the production of financial information on securities during the Belle Époque. Gille (1959) is a comprehensive history of the French newspapers during the Second Empire. Esteves (2007) carefully reviews the specialized media that bondholders could have used to get informed about their portfolio. Bignon and Flandreau (2009) study the industrial organization of the pre-WW I media market and explain it by agents protecting their reputation from badmouthing by others, i.e. from the disclosure of damageable (false) information on them.

This paper is also related to the literature that developed at the crossroads of media economics and finance or political science. We borrow from the political science literature a focus on measuring bias. A few authors have recently attempted to measure bias in the news in the political arena (Groseclose and Milyo 2005; Gentzkow and Shapiro 2006). This paper is also linked to those papers that measured the media's relationship to the financial markets. Some work in this vein shows that, by disseminating information, the press helped to reduce economic inefficiencies such as the private benefits received by CEOs (Dyck and Zingales 2004). Most of these papers, however, concerned measuring and explaining media bias in reporting financial market information. Huberman and Regev (2001) gave an example of the media's effect on stock prices that stemmed solely from the reporting of soft information. Some other researchers used the 'event study' approach to test the impact of financial newspapers' stories on stock prices (Chan 2003; Bhattacharya et al. 2004). In the field of finance, the most similar approach is that of Reuter and Zitzewitz (2006), who studied the bias created by advertisements in the selection of a newspaper's coverage of mutual funds. In contrast, we study the coverage of listed firms and the impact of a different payment scheme. The accusation against French financial periodicals looks similar to that made by researchers studying newspapers in the United States in the nineteenth century, namely, that the political press was partisan (Hamilton 2004) and biased (Gentzkow et al. 2006). Because our paper deals with financial periodicals, we are able to show the importance of the bias and whether it matters.

The rest of the paper is organized as follows. Section 2 explores the various scandals that hurt the financial press in France during the latter part of the nineteenth century and the beginning of the twentieth century. Section 3 presents our data and explains the test that is implemented in Section 4. Section 5 presents the results, and Section 6 concludes.

2. Information slanting and firms' payments to newspapers

Much as some today blame the payment structure of rating agencies for their (disputed) failure to provide appropriate rankings, historians have used various financial scandals to infer the efficiency of the media in disseminating information on financial assets. The anecdotal evidence demonstrates that payments made by information sources to newspapers distorted the published information. We rather prefer to use this evidence to isolate the appropriate variable to serve as a proxy for hidden payments made to newspapers in order to construct the quantitative test implemented in the rest of the paper. Section 2.1 presents these various affairs and the claims historians infer from their study. Section 2.2 studies the industrial organization of payments made by firms to newspapers to derive a proxy for them, which will be used later in our quantitative analysis.

2.1. Newspapers in turmoil: From the Panama scandal to the Rochette affair

During the two decades from the 1890s to World War I, a common opinion was circulated in journals, books, and parliamentary reports that the press was bribed by its information sources and that this distorted the information published. The opinion that the press was bribed to slant published information first appeared after the Panama scandal burst on the scene in 1892. [4] This scandal was openly discussed and resulted in a report by a special commission of lawmakers as well as a court decision. It was then revealed that politicians and newspapers had been paid to put a positive spin on the activities of the Panama Canal Company and, notably, to foster the success of the company's bond issues. The Panama Canal Company had paid newspapers and journalists for announcements, advertising, and favorable editorial coverage. Between 1880 and 1888, it paid 12 to 13 m francs to newspapers while it raised about 1.5 b francs from the public (Martin 2006, p. 23).[5]

The scandal led to charges of corruption levelled at both the press and the politicians. It caused Anatole Leroy-Beaulieu—then a professor at Sciences Po—to question the very organization of the democratic system, blaming 'extravagant governments, drudge lawmakers and a venal press'. The press was especially attacked because the scandal revealed that it was at odds with the romantic notion of the journalist who uses his pen as 'a sword pure of any shed blood' and so is 'the modern knight, the righter of wrongs' (Leroy-Beaulieu 1896, p. 733).[6] As a result of the Panama scandal, the perception of the newspapers' accuracy changed among the general public and the elite. Discussions revolved around the role played by money in slanting published information. *La Revue Bleue*, an influential periodical among the elite, opened its columns in 1897 to debate on the 'responsibilities of the press'. Henry Béranger, the discussion's initiator, argued that 'cash, when it reigns, is never a

[4] Slanting is defined by Hayakawa (1940) as the process of deliberately selecting details that are favorable or unfavorable to the subject being described.

[5] Although most newspapers received some payments, they might have been modest compared with the operating income or the advertising revenue. Eveno (2003, p. 67) computed that *Le Figaro* (its manager and journalists) received 500,450 francs from the Panama Canal Company during the period (amounting to 55,600 francs per annum), whereas its annual operating income fluctuated between 1.88 and 2.58 m.

[6] He had earlier written that 'among all the vileness of the Panama scandal, the role played by the press was the most shameful' (Leroy-Beaulieu 1894, p. 733).

principle of superiority and quite always a principle of corruption' and that 'our legislature planned the independence of the press towards judges or the police, but did not foresee the slavery of the press towards business and the plutocracy'. Yet not all commentators shared this view. Georges Clémenceau—a lawmaker and journalist at *L'Aurore*—argued that the readers must be blamed for failing to identify the truth; the novelist Émile Zola and the socialist lawmaker Jean Jaurès pointed out that one should be confident in the outcome of a free market that sorts out good journals from the bad.

March 1908 saw another financial affair that linked politics, the financial market, and the media. This was the Rochette affair, which also ended up in a commission of the National Assembly and a court judgment.[7] Henri Rochette was a financier who owned two banks, about a dozen other companies (notably mines), and three financial newspapers. When he tried to take over *Le Petit Journal*—a newspaper owned and managed by Senator Charles Prevet—the Paris *préfet Lépine* (the highest representative of the French government in Paris) searched for investors to lodge a complaint against Rochette, who was accused of releasing flawed and possibly altered information on his companies. According to the 1910 judgment, he attempted to influence investors through his own newspapers and by contracting with other newspapers to publicize his companies.[8] Rochette was convicted and sentenced to three years in jail. This financial turmoil revived the public debate on the mutual influence of newspapers and financiers.

In the context of periodic scandals, some commentators at the time such as Lysis (the pseudonym of the journalist Eugene Letailleur) blamed the 'quite universal corruption of our [French] press, paid, sold, indentured by the financial powers' (1912, p. 168).[9] Paul Leroy-Beaulieu, editor of *L'Économiste Français*, argued that when 'articles and advertising are mixed up, it is clear that the press is losing its authority. It should no longer be regarded as a collection of information and people must distrust it' (in Cassagnac 1893, pp. 4–5). The novelist Émile Zola (1880, p. 377), after noticing that 'most newspapers that championed morality are indentured to the financial companies', argued that they are 'more or less noticeable cutthroat, organized robbery, lie and untruth printed in capital letters'. He concluded by adding that 'many fly-by-night businesses experienced success while many families went bankrupt' because of those practices. Eugene Kaufmann asserted that the financial press 'does not have a value as a source of information; it is— besides few exceptions that are becoming rarer—an *advertisement press* rather than an *opinion press*' (1914, p. 210; emphasis in the original). In 1925, Renard wrote that 'the easiness with which the press extorts money had the effect of diminishing the consideration and authority that it could and should have enjoyed' (p. 252).

Building on these judgments, French historians—with the notable exception of Marc Martin—blamed this venality for weakening the press's credibility among the public. As Albert (1972, pp. 266–267) asserted, 'financial advertising contributed to a significant extent to give to the French people a

[7] The most reliable source of information on the Rochette affair is the parliamentary report (Folleville 1911).
[8] Rochette owned *Finance Pratique*, *Bulletin Hebdomadaire du Banco Franco Espagnol*, and *Moniteur de la Banque et de la Bourse*.
[9] See also Esteves (2007, pp. 5–6) for an account of Lysis's grievances.

distorted view of the facts'. Furthermore, 'it exerted a real censorship on the economic information which resulted, in the short run, in a discredit of the business world to French eyes and in the long run, to divert their attention from economic issues'. Jeanneney (1981) observed that opinions published in newspapers 'were surely not independent of secret subsidies' (p. 210) and noted that financial advertising 'takes the shape of misleading editorial analysis' (p. 211). Although financial affairs clearly hurt investors, relying on extreme events to assess the quality of financial newspapers can be misleading. We therefore propose a methodology to measure the bias implied by the advertisements. The next section uses historical evidence to derive a proxy for companies' payments to newspapers.

2.2. On payments by companies to newspapers

Before World War I, two different terms were used to describe payments made by companies to newspapers in exchange for mention. The first was called *advertising*. Leroy-Beaulieu (1906, p. 251) defined them as "conspicuous announcements printed in special characters and appearing in a predefined section". It was then possible for the reader to distinguish them from the regular editorial content. The second term, *réclame*, is now considered outdated by French dictionaries. According to the dictionary *Le Littré* (1872–1877), *réclames – a special type of advertising,* – are laudatory articles that normally appeared in the editorial section of the newspaper and were paid for by the companies being lauded. Leroy-Beaulieu (1906, p. 251) warned investors that *réclames* were widespread and tended to substitute for *advertising*. Both types involved payments by companies to newspapers. A major difference is that payments made in the advertising section are obvious to both the reader and the researcher, whereas it is impossible to distinguish between regular articles and *réclames*.[10]

Many evidences helps to draw the description of the working of the payments made for *réclames*. According to Lajeune-Vilar (1895, p. 53), they were an important—if not an essential—part of the budget of most independent newspapers. Oscar Marinitsch, who worked in the financial advertising sector, pointed out that 'the good (and the bad) deals cannot succeed without the help of the press' and that the information providers 'contracted with the journalists or editor of the financial press or of the newspapers' financial section' (1892, p. 292). Leroy-Beaulieu (1906, p. 253) noticed that press campaigns using *réclames* usually lasted between one and three months, but they could have been maintained for several years. They were often paid on a periodic and open-ended basis. Lajeune-Vilar (1895, p. 53) distinguished between two types of payments: those made on a monthly basis and those that he called 'expenditures in advertising granted by the investment bank that wanted to boost a new business or company'. In the latter case, the aim was to increase the trading of some security or the success of the introduction of a security on the stock exchange (Vallé 1893, p. 49).

[10] During the Panama scandal, the fear that the scandal caused newspapers to lose credibility led some editors to discuss current advertising arrangements. Paul de Cassagnac, a lawmaker of the Bonapartist party and editor of *L'Autorité*, argued in 1893 that receiving funds from companies is not, per se, an indication of corruption as long as the editorial content and the advertising section appear as two different and clearly separate sections of the newspaper. This view was not implemented before 1914. See Delporte (1999) and Feyel (2003).

In return for its payment, the payer expected to receive positive coverage (Leroy-Beaulieu 1906, p. 252; Soreph 1909, p. 57). Soreph (1909, p. 57) indicated that such sponsored securities were repeatedly exposed in the newspapers, and that in each new issue, the information disclosed became more 'triumphant and precise'. Leroy-Beaulieu (1906, p. 252) advised investors that when the same type of sentences using clichéd language appeared in an article, this should be taken as self-serving (paid) advice. These facts suggest that coverage could be taken as a proxy for slanting.

Companies did not paid directly the newspapers; rather, intermediaries, such as investment banks and specialized brokers, arranged for the payments to be made (Lajeune-Vilar 1895; Zeldin 1993, pp. 519–526). Even Russia, one of the most important agents on the Paris financial market, did not bypass this complex market structure (see Raffalovich 1931, pp. 74, 176, 205, 208).[11] It delegated payments to its main investment bank, *Banque de Paris et des Pays Bas*, which further delegated the payments to newspapers through Lenoir, a specialized broker. [12] The main advantages for delegating payments to investment banks included the following: (1) pooling the payments of various firms gave banks more bargaining power;[13] And (2) the banks knew much more than the firms about the workings of the media industry. The likely rationale for the delegation of payments by banks to specialized brokers was that the brokers had a special talent for enforcing the contracts. According to the parliamentary report on the Panama Canal affair, this was the company's motivation in 1886 for making payments to newspapers through the broker Batiau (Vallé 1893, p. 358).

One consequence of the complex structure through which hidden payments flowed from companies to newspapers is that investment manuals provided information on the investment bank with which a company was in business. Indeed, investment banks provided a bundle of financial services to companies, including legal representation, payment of the dividend or the coupon of securities, and, of course, the hidden payments made to newspapers.

3. Methodology and samples on newspapers and securities

Although hidden payments could have distorted the information available to investors and hence their allocation of funds to financial assets, we show in Section 3.1 that such payments do not, in themselves, prove information distortion. In order to assess the quality of the newspapers, Section 3.2 presents a quantitative test to construct a measure of media bias.

3.1. Theoretical background

A financial newspaper is an intermediary that selects a set of information and reveals it to its readers. Dyck and Zingales (2002) argued that their effect is to 'selectively reduce [an] agent's cost of

[11] See Long (1972) for the history of payments of the Russian government to the French press.
[12] See Raffalovich (1931).
[13] Newspapers regularly asked for an increase in advertising from the Russian Empire. A letter dated October 20, 1908 stated: 'A contract between the representative of the Finances ministry and the various newspapers will have the drawback of overexciting the envies because they will have for the first time to negotiate directly with a government official of Russia instead of a bank employee' (Raffalovich 1931, p. 207).

collecting information and evaluating information' (p. 109). Most of the discussion implied by this definition revolves around the elements that determine the selection of news. The news reporting can be biased by conflicts of interest originating in the preferences of their readership (Mullainathan and Shleifer 2005), the objective of their journalists (Baron 2006), or their relationships with information providers or advertisers (Dyck and Zingales 2002; Besley and Prat 2006).

Besley and Prat (2006) showed that payments by information providers reduce the informational content of the media when they have an interest in accepting bribes for suppressing the disclosure of bad news. In their model, the conflict of interest relies crucially on the assumption that the interests of readers and the government are in opposition in a context in which the dissemination of positive news is not credible. Because firms derive rewards for being mentioned in the media because this either influences the portfolio choice of investors (Merton 1987) or generates an asset price above other comparable assets (Veldkamp 2006), they have a vested interest in paying the media either to suppress some news or to publicize it among investors. In the context of financial newspapers, payments could motivate newspapers not to publish negative information on companies or to overweight the coverage of paying companies.

Another approach is provided by the two-sided market literature (Rochet and Tirole 2004) that has been developed to understand the working of markets that involve an intermediary whose business consists of making connections between various types of agents (the two sides of the market).[14] A newspaper perfectly fits with this definition. On one side, it forms relationships with the information providers (the supply side of the news) and with the advertising market; on the other side, it interacts with readers by selling issues (the demand side). In this framework, the payment structure is an instrument for inducing both sides of the market to participate: the price charged to one side of the market can be used to subsidize the other side. Bignon and Flandreau (2009) propose a rationale for firms with good financial performances to pay to get coverage in newspapers. They argue that those payments were one strategy used to counteract the threat of badmouthing. Companies' payments were then complementary to readers' payments, and newspapers can have chosen to accept payments to publish *réclames* only of companies that performed well and to refuse those of bad performing.

We therefore have two competing explanations of the payment structure. One explanation, that followed Besley and Prat (2006), predicts that they induced a coverage bias toward poor-performing firms, whereas the other explanation leaves the expected impact on the editorial policy undecided. The answer is therefore an empirical question. To gauge whether newspaper readers were hurt by these payments, we implement a quantitative test. Its methodology works in two steps. First, we use regression analysis to measure the existence of a coverage bias. Second, we compute the yields and

[14] As noticed by Rochet and Tirole (2004), this literature applied to two-sided markets in which one side imposes on the other an externality that cannot be compensated for using a side payment determined through a Coasian bargaining. Notice that the information published by newspapers clearly exerted an externality on readers (and vice versa). An increase in the number of companies covered benefited the readership, whereas increasing the readership also increased the willingness of companies to appear in a newspaper. During the period we study, no side payments were made to compensate one side (or the other) for the externality thereby created.

returns of equity portfolios to measure the impact of this bias on the performance of these portfolios. The next subsection describes the variables and the method used to compute the results of the regressions and the stock portfolios.

3.2. A measure of the coverage bias induced by hidden payments

One can expect rational readers to buy one issue of a newspaper if the value of its informational content is greater than the cost of buying it. From the reader's point of view, a financial newspaper is a collection of pieces of information that could affect asset prices. A reader then await information on the performance of firms (i.e., on the return and the risk of the stock), but his preferences can also include the firm's characteristics, such as the nationality, the country in which it is operated, or its sector of activity. The nationality is likely to influence investors because it defines the legal system in which property rights can be enforced. We then check for any relationship between a firm's country of registration and its exposure in the press. This effect will be negative (positive) if investors were reluctant (more likely) to hold stocks issued by foreign firms. If investors formed preferences over a sector, a media outlet may bias disclosed information toward that sector.

Another important determinant of the demand for newspapers is the cost or ease with which an investor can find information on companies without buying a newspaper. In a world in which investors hold stocks of firms operating abroad, this is likely to influence the purchasing decision of the readership because an increase in distance makes it more expensive to acquire information on foreign companies (as compared with domestic companies) without buying a newspaper. We then expect the media to give comparatively greater coverage to companies operating their business abroad.

We will also allow firms' coverage to reflect the newspapers' tendency to write about enterprises with a wide audience. Audience is measured by market capitalization. If it mattered, its effect will be to switch the distribution of published news toward big firms, and the coefficient of the firm's size will be positive. Newspapers could also have targeted readers who invested with different time horizons. If liquidity traders (i.e., traders who value the liquidity of assets) are targeted, the newspaper will tend to cover equities characterized by higher stock's liquidity and (relatively) lower price volatility. Another potential targeted readership was long-term investors (known as *rentiers*) with a 'buy and hold' strategy who must have care more about the yield and security of their investment. If the preferences of the readership were sufficiently diverse, some newspapers could have targeted investors looking for stocks with low risk and low yield and others could have tried to attract those with higher risk and higher yield. Although this preference is not measurable, the next subsection will show how some transformation of the result of the regression analysis will allow us to observe market segmentation according to the preferences of investors toward risk.

Payments by firms to newspapers could have biased published information in favor of paying firms. First, as pointed in Reuter and Zitzewitz (2006), one can expect a positive correlation between a

firm's coverage and the volume of its advertising.[15] The variable *Ads* measures *advertisements* made in special characters and appearing in a predefined section. Second the regression also includes a proxy for *réclames*. We account for them by introducing a dummy variable that measures the link between the firm and the investment bank that paid the dividend to investors in lieu of the company. The dummy is equal to one if a link is found between a company and a given bank *X* (where *X* stands for the name of the bank). Because it could have been more likely that firms paid advertising if they were raising funds on the financial market, we introduced a variable *IPO* that is equal to one if the company sold stocks to investors during the year of our study.

Media bias is assessed using regressions of the coverage of each company over its characteristics, performance, and the payments it made. The following specification is considered:

$$Exposures_i = constant + a\,(FP_i) + b\,(FC_i) + d\,(Ads_i) + e\,(Bank\ X_i) + f\,(IPO_i) + u_i$$

where *Exposures* is the number of articles a company i had in a newspaper, *FP* stands for the set of variables measuring the financial performance of its stock, and *FC* is a set of controls for the firm's characteristics. The regression also included the dummy variable *IPO*. The variable *Ads* can be either the number of advertisements or a dummy variable (equal to one if the company advertised). The variable *Bank X* is a full set of dummies that accounts for the link between a company and a bank.

The null hypothesis is as follows. When a newspaper's readers are rational investors (i.e., they want to learn about events that can affect the value of their financial assets), we expect the editor to select the most accurate available information in order to maximize readership (and build a reputation). Thus, we expect to find that the financial variables are significant and that the payment variables (both *Ads* and *Bank X*) are insignificant. This effect could be offset by firms paying to boost their exposure in the newspaper. In this case, the financial variables may well appear to be insignificant, whereas the payment variables are significant, indicating that payments were the main driver of the editorial policy. Another possibility is that both the payments and performance variables are significant. In that case, the regression will not inform on the effect on investors of the payments.

The mere existence of media bias, however, does not indicate whether the bias is detrimental to readers. Indeed, even if the payment variables appeared to be positive and significant, investors would suffer only if a newspaper was characterized by a low ability or willingness to select the companies accurately (i.e., if it switched its news coverage to poorly performing firms). As a preliminary step, we tackle this issue by checking whether the newspaper chose the best performing firms among those linked to *Bank X*. We introduce an interaction term between the *Bank X* and the *FP* variables (e.g., stock return). If this variable is positive and significant, then this indicates that only firms with the best performance were highlighted in the newspapers.

[15] Reuter and Zitzewitz (2006) showed that major personal finance magazines are 'more likely to recommend funds from families that have advertised within their pages in the past', but they document no such relationship for newspapers (e.g., the *New York Times*) covering more general subjects aimed at a wider audience.

The results of the regressions only provide a mapping between the companies' coverage and its determinants. In a second step we measure the impact of the media bias on investors. The aim is to judge the newspaper's coverage in terms of the financial performance it would have yielded, had a reader bought its portfolio of equities using the coverage as the only choice variable. The measures used to assess the performance of a portfolio are the mean of the return and the variance of the return, both computed for each newspaper based on the population of firms that it covered.

The weight of a company in the portfolio is computed as the ratio between the number of exposures received by the company and the total number of exposures (with the sum of all weights equal to one). There are still various ways to compute the weights. When the coverage is biased toward paying firms, the observed coverage defines a portfolio suffering from media bias. Using the results of the regression analysis, the weights of unbiased portfolios can be computed by removing the effect of the payment variables on media coverage. The various weights are then used to compute the return and the variance of various portfolios that will be compared to check whether unbiased portfolios performed better than biased ones. It will be said that investors are worse off with a biased newspaper if its biased portfolio performs worse than the unbiased ones.

4. Sample, time period, and coding of companies' coverage

The choice of the sample of newspapers is discussed in Section 4.1. Section 4.2 presents the time period chosen to implement the test. Section 4.3 describes the coding methodology and the descriptive statistics on coverage.

4.1. Sample of newspapers

The number of financial newspapers grew from 210 in 1889 to a peak of 287 in 1907.[16] No such newspapers were digitalised, and, given that we had to count coverage manually, a selection of just a few was inevitable. The ideal criteria to select the sample would have been to choose those with the greatest circulation because this would have provided a measure of their impact on investors. Unfortunately, figures on circulation were considered proprietary information and were kept secret by the editors.[17] The impact of newspapers must therefore be determined using other variables. To choose the proxies, we make the following assumptions. Because newspapers were the sole (public) information providers on firms and because no regulation required legal disclosures by firms, we would expect readers to be rational and searched for informative, high-quality newspapers.

The selection of the sample tried to avoid two pitfalls. The first consisted of choosing newspapers with a bad reputation for accuracy but no circulation. Indeed, some commentators recognized that some newspapers were managed by fly-by-night editors who tried to blackmail companies and/or sovereign states. They warned investors about them but added that that they were

[16] As given by *Annuaire de la presse française et étrangère et du monde politique*, a yearly publication edited by Henri Avenel up to 1906 and by Paul Bluysen thereafter.
[17] See the discussion by Émile Mermet (1881, pp. IV and V).

easy to recognize because they were cheaply produced (Lajeune-Vilar 1895, p. 50; Leroy-Beaulieu 1906, pp. 250–251; Neymarck, 1911, p. 136). Soreph (1909, p. 54) indicated that 'we shall not expect careful readers to buy them'. Bignon and Flandreau (2009) showed that the market structure limited their ability to extract money and that they appeared intermittently, which limited their readership. Although such newspapers were surely biased (they were intended for that), they likely did not impact the stock market through their readership. Therefore, for a bad newspaper to have readers, it must have copied the characteristics of quality newspapers.[18] Soreph (1909) pointed the recurrence of this strategy.[19]

The second pitfall was to select newspapers that were considered undoubtedly unbiased. Those that valued their reputation must have had the lowest incentive to bias information. However most commentators did not considered quality newspapers as unbiased.[20] Lajeune-Vilar (1895, p. 51) stressed that 'less than a dozen newspapers such as *Le messager de Paris*, *L'économiste* [français] or *Le capitaliste* really had an influence on the financial business' but admitted that 'they had a stake in the various financial operations' (pp. 51–52). Albert (1972) questioned the integrity and the independence of the reputable *L'Économiste Français* and *L'Économiste Européen* (p. 262; Soreph 1909, p. 54). Because most financial newspapers were accused of being systematically biased, it appeared necessary to study the existence of bias also in reputable newspapers. We however recognize that the very few extremely expensive newspapers – costing more than 80 centimes – must have had a lower tendency to cheat readers, so we had excluded them from the sample.

The independence of newspapers towards the financial sector was hotly debated and must have been valued by readers. But some newspapers also realized this and proclaimed that they were independent, whereas, in fact, they were owned by some bank or financial intermediary. While gathering information on ownership, we found that it was not uncommon to read on the front page that the newspaper was independent although a simple verification shows that it was managed by a bank.[21] Some newspapers offered free services to their subscribers such as personalized financial advice, security trades, and cashing of coupons or dividends. Those were typical services of banks and brokers and signalled the ownership. Many commentators at the time noticed that bank-owned newspapers were not fully reliable if the bank used the newspaper to publicize its business. This was the goal assigned by Rochette to *Finance Pratique* (Folleville 1911, pp. 126–127). Lajeune-Vilar (1895, p. 52) indicated that those newspapers were subsidized by their owners to balance their budgets. Because this could have resulted in a lower need to rely on external payments, one can expect such newspapers to

[18] Leroy-Beaulieu, 1906, p. 252.
[19] Soreph (1909, p. 55) indicated that a strategy used by newspapers that tried to swindle investors was to mimic the organization of the most reputable newspapers although he added that it was easy to avoid the trap.
[20] Marinitsch (1892, p. 294) asserted that only two or three newspapers (out of the ten he advised readers to refer to) combined an acknowledged expertise with an unquestionable integrity. No name was provided.
[21] *La Revue du Marché Financier* claimed that it was owned and managed by the bank Vidal up to 1907. The mention was deleted in July, but the business continued at the same address and phone number as Vidal. The surreal case is that of *Groupement des Interêts Financiers*, which proclaimed being independent while announcing that it was owned and managed by the bank Auvray.

be biased only toward the bank's business. A countervailing argument, however, was that nothing precluded a newspaper from accepting payments from other firms. Indeed, Soreph (1909, p 58) argued that even a bank-owned newspaper could have been paid by a bank's competitor to highlight its activities. Therefore, it is worth considering both independent and bank-owned newspapers.

The selection of the sample is made using a set of observable characteristics that were recognised by memoirs or investment manuals as proxies for quality newspapers (Feydeau 1882, p. 171; Lajeune-Vilar 1895; Leroy-Beaulieu 1906; Soreph 1909). These characteristics include a periodic appearance, the year of founding, a clear indication of the name of the editor; and the price, tone, and organization of the editorial content. Four newspapers were included in our dataset. Two were managed by independent journalists, who were also economists or statisticians.[22] *L'Économiste Européen* (hereafter *EURO*) and *Le Rentier* (*RENT*, published every 10 days) enjoyed some reputation and did not offer free financial services. The sample also included the *Journal des Intérêts Financiers*; *INTFIN* that was owned and managed by an investment bank (*Crédit Mobilier*) and another that was probably owned by a financial intermediary (*La Semaine Financière*; *SEM*). Although it appeared to be independent and managed by journalist Charles Bourdon, *SEM* offered its readers brokerage services and had links with *Banque des Français*.[23] Favre (1909) classified RENT and EURO as independent, whereas the others were dependent. The first issue of *EURO* was published in 1892, *INTFIN* in 1888, *RENT* in 1869, and *SEM* in 1856. These newspapers were either weekly or published every ten days, as were 50.3% of financial newspapers in 1907.[24]

Although the focus and organization of the news could have differed greatly among newspapers, our sample is limited to those that shared the same organization, with a first section presenting and discussing macroeconomic events, a second section presenting detailed financial information on firms, a third section that pooled advertisements and a final section that gave a list of asset prices. Alfred Neymarck advised investors to read periodicals for which they knew the name of the editors, trustees, or journalists (1911, p. 136). The endless repetition of this advice in investment manuals must have had an impact on readers, and we decided to follow it.

Soreph (1909, p. 54) pointed out that the price reflects quality and urged readers to care about this. Ernest Feydeau, a bank employee and novelist, that pointed that readers must be concerned with the fact that the precision, accuracy, and coverage of information in a newspaper is provided in proportion to its price (1882, p. 173). Newspapers priced less than 15 centimes per issue were then excluded from the sample. As detailed in Table 1, one issue of *EURO* or *RENT* cost half a franc, whereas *SEM* cost 25 centimes and *INTFIN* 15 centimes. EURO and RENT were quite expansive as compared to the other financial newspapers as the mean price of financial newspapers was indeed 34

[22] Edmond Théry and Alfred Neymarck, respectively.
[23] The newspaper and the *Banque des Français*, shared the same address. Moreover, on November 2, 1907, the issue indicated that 'as the stock market will be closed on Saturday, so will the offices and cashier of the *Semaine Financière* and the *Banque des Français*'.
[24] The comparison with the population of financial newspapers were made using Bluysen (1907).

centimes, and the modal and median value was 25 centimes.[25] Deflated by the consumer price index, the 2007 value of these prices ranges between 0.88 and 1.76 euros (see table 1). Computing the actual cost using hourly wages gives higher but comparable figures (between 1.24 and 4.13 euros).

Table 1: Statistics on the newspapers in our sample

Newspapers' characteristics	***EURO***	***INTFIN***	***RENT***	***SEM***
Year of founding	1892	1888	1869	1856
Periodicity	weekly	weekly		24
Price per issue (francs)	0.50	0.15	0.50	0.25
(a) Number of pages (adjusted)[26]	40	20	32	24
(b) Number of pages without ads (adjusted)	35	16	23.2	19
Estimated price per issue in 2007 (euros)[27]	1.76 to 4.13	0.53 to 1.24	1.76 to 4.13	0.88 to 2.07
Price per issue / (a) (francs)	0.0125	0.0075	0.0156	0.0104
Price per issue / (b) (francs)	0.0143	0.0094	0.0215	0.0132

Source: authors' calculation

4.2. Sample period

The data were collected for the period from 1 July to 31 December 1907. To minimize the possible effects stemming from a bear or a bull market, we chose a period that was characterized by a fairly stable stock index. Figure 1 depicts the evolution of the Paris stock index and compares it with those of the other main stock markets.[28] During the last semester of 1907, the Dow Jones Industrial Average fell by 27.5% and both Berlin and London were also hurt. In Paris, the decrease was 2.3% during the first semester, but the index increased by 0.9% during the second semester (while London dropped by 2.4%). There is only scattered evidence that the shock that hurt New York impacted the European stock markets to the same degree. The three biggest monthly drops in Paris in 1907 amounted to 3.6% in March, 2.6% in June, and 1.3% in October, whereas the Dow Jones Industrial Average dropped by 13.3% in March, 13.3% in August, and 15.5% in October.[29] The three biggest decreases of the Berlin (London) monthly index were 3.9% (3.3%) in March, 2.7% (1.9%) in June, and 2.7% in October (3.8% in August). Le Bris (2009) shows that 1907 does not appeared as one of the 20 biggest crashes of the Paris Stock-exchanges between 1854 and 2008 while it was in New York.

[25] The statistics on the prices of the other newspapers were computed using Bluysen (1907). Prices ranged from 5 centimes to 1 franc and were evenly distributed, with 22% of the newspapers being price at less than 10 centimes, 9% at 15 centimes, 27% at 25 centimes and 17% at 50 centimes.

[26] The number of pages per issue of *RENT* was adjusted to account for its larger format.

[27] Two methods were used to estimate the current price. The first number was computed using the general price index (1 franc in 1907 equals 3.51 euros in 2007). The second number was computed using the hourly wage, gathered from the 1946 INSEE yearbook, for the 1906 average wage of a Parisian worker (0.85 francs) and using the 2007 minimum wage (7.03 euros). When one hour of work earned 1.7 times the price of *EURO* in 1906, it costs 4.13 euros in 2007. Using both methods to replicate the price evolution of the sole newspaper (*Le Figaro*) that existed in 1907 and today show that its 1907 price (0.15 francs) is valued at 0.52 euros using the price index and 1.23 euros using the hourly wage (for a 2007 price of 1.10 euros). The second estimate is also comparable to the price of today's financial periodicals, suggesting that newspaper prices actually increased more than the CPI.

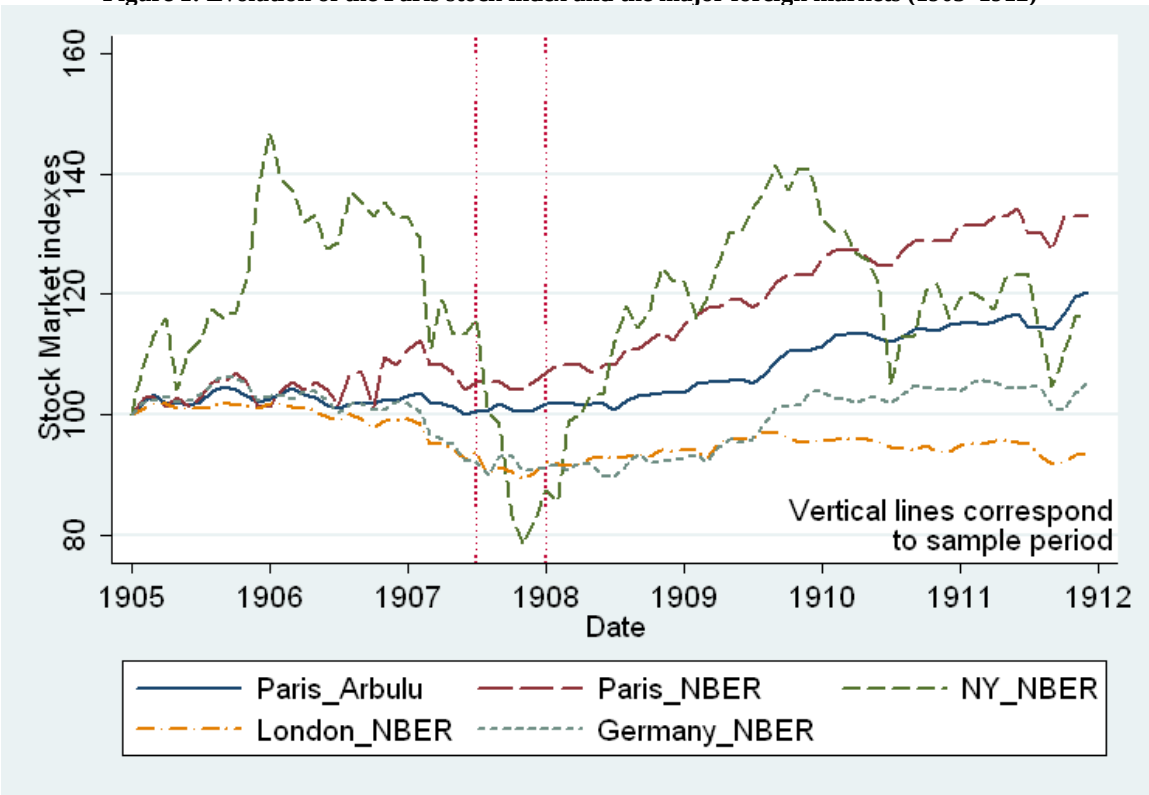
[28] The three reconstructed French index (Arbulu, 2007, Le Bris, 2009, and the NBER) show the same pattern during the second semester of 1907. Data for Berlin and London are taken from the NBER database.

29 All variation of the stock index made use of the NBER database. Using Arbulu (2007) the numbers become respectively -1.6, -1.4 and -1% (for the same months). Using Le Bris (2009), they are -1.27% in March, -0.88% in May and -1% in October. The dates used for computation of the index differ in Le Bris vis-à-vis the other.

This does not imply that French investors did not lose money as a result of the US crisis. As noted by Neymarck (1911, pp. 392), the losers were 'naive and too confident investors' that bought 'securities traded only abroad or those of various types of mines.'

The U.S. financial crisis had a small impact on the French economy. In 1907, the French gross domestic product (GDP) grew by 5% according to Toutain (1997) and by 7.9% according to Levy-Leboyer and Bourguignon (1985). Given that those numbers are an ex post facto reconstruction, one may wonder about the evolution of a more accurate measure of business cycles. The evolution of the index of industrial prices shows a 4.2% increase in 1907 and a drop of 2% in 1908. But this drop is the seventh lowest (among eight) during the 1895–1914 period. This evidence of a weak transmission of the US crisis to the French economy is in line with Bordo and Murshid (2006), who pointed out that, 'before 1914, financial shocks were communicated from the core countries of Europe (especially the UK) to the periphery, but in general this channel did not operate in reverse'.

Figure 1: Evolution of the Paris stock index and the major foreign markets (1905–1912)



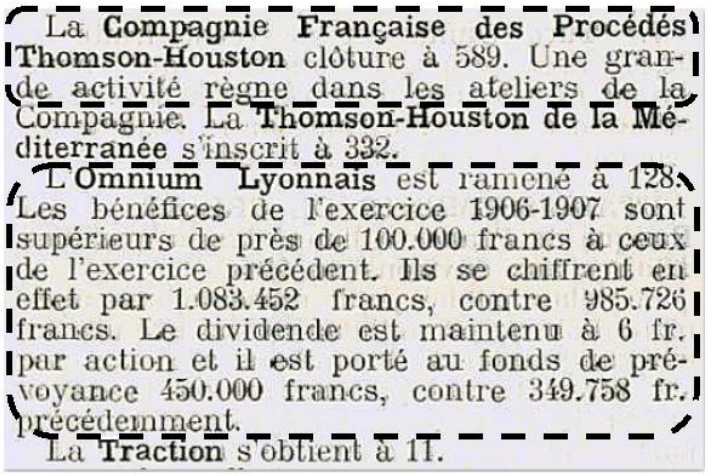
Source : NBER stock index database and Arbulu (2007)

4.3. Coding methodology and descriptive statistics on coverage

The media exposure of companies is assessed by counting the number of times an article was published on each company publicly traded on the Paris stock exchanges in each newspaper. The information published was coded as follows. We considered as significant any piece of information other than the stock price. Each newspaper published a list of prices in a separate section, and each

piece of information that mentioned only the stock price of the company was coded as zero; more detailed information was coded as one. Figure 3 shows an excerpt from the November 16, 1907, edition of *SEM* that illustrates our coding methodology. For Thomson-Houston de la Méditerranée and Traction, the newspaper gives only the stock price, and so a value of zero was assigned. Readers obtained more valuable information (displayed in a dashed box on figure 2) for the other two companies mentioned in Figure 2, such as that 'the factories of the Compagnie Française des Procédés Thomson-Houston experienced a significant business activity' and that Omnium Lyonnais made higher profits in 1906–1907 than before. These two observations were each coded as one.

Figure 2: Excerpt from *La Semaine Financière*, 16 November 1907


La **Compagnie Française des Procédés Thomson-Houston** clôture à 589. Une grande activité règne dans les ateliers de la Compagnie. La **Thomson-Houston de la Méditerranée** s'inscrit à 332.

L'**Omnium Lyonnais** est ramené à 128. Les bénéfices de l'exercice 1906-1907 sont supérieurs de près de 100.000 francs à ceux de l'exercice précédent. Ils se chiffrent en effet par 1.083.452 francs, contre 985.726 francs. Le dividende est maintenu à 6 fr. par action et il est porté au fonds de prévoyance 450.000 francs, contre 349.758 fr. précédemment.

La **Traction** s'obtient à 11.

The sum of news releases on a given company defines a statistic that accounts for the media coverage of the firm in a given newspaper. The descriptive statistics of the sample indicate that, altogether, 929 firms were mentioned or discussed in 4,817 articles. Because of missing data for explanatory variables, our analysis will henceforth focus on a reduced sample of 694 firms that received 4,409 articles. News coverage was classified as either negative or positive. Negative exposure was defined as any information or event that likely had a negative impact on a company's current or future performance, regardless of whether the information was factual or not. One example (Cape Copper), taken from *L'Économiste Européen* of the 30 September 1907, is as follows: 'the stock price is declining due to reduced production in August, itself due to lower grade ore and a new tax will now hit the company's profits'. Other examples include lower sales, losses, increased costs, strikes, and announcements of lower dividends. Using these criteria, only 5.1% of the write-ups in *EURO*, 4.9% in *INTFIN*, 8.2% in *RENT*, and 3.5% in *SEM* were negative.

Table 2: Cross-tabulation of the exposures of 694 firms in financial newspapers

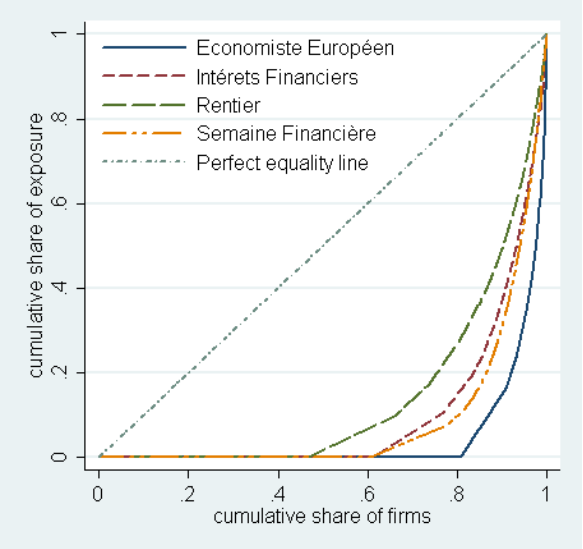
		EURO				*INTFIN*				*RENT*				*SEM*			
		0	**1–5**	**5+**	***Total***	**0**	**1–5**	**5+**	***Total***	**0**	**1–5**	**5+**	***Total***	**0**	**1–5**	**5+**	***Total***
EURO	**0**	561			561												
	1–5		117		117												
	5+			16	16												
INTFIN	**0**	388	29	8	425	425			425								
	1–5	143	57	4	204		204		204								
	5+	30	31	4	65			65	65								
RENT	**0**	293	26	5	324	286	37	1	324	324			324				
	1–5	238	51	2	291	133	136	22	291		291		291				
	5+	30	40	9	79	6	31	42	79			79	79				
SEM	**0**	398	21	2	421	354	62	5	421	271	141	9	421	421			421
	1–5	130	46	4	180	53	107	20	180	34	124	22	180		180		180
	5+	33	50	10	93	18	35	40	93	19	26	48	93			93	93

Source: authors' calculation. Entries are the number of firms with zero, one to five, or more than five exposures.

Newspapers differed in the number of companies on which information was published. Out of 694 firms, *RENT* provided exposure to only 370 of them; and *EURO*, *SEM*, and *INTFIN* did it for (respectively) 133, 269, and 273 (see Table 2). To show that the media focused coverage on a subset of firms, we plot the Lorenz curves of each newspaper in Figure 3. It appears that about 60% of the firms never appeared in *INTFIN* or *SEM*. The Gini index is 0.72 for *RENT* and 0.91 for *EURO*.[30] Another noteworthy feature is that newspapers did not choose to report on the same sub-sample. Table 2 illustrates that, out of 561 companies that never appeared in *EURO*, 143 appeared one to five times (and 30 appeared more than five times) in *INTFIN*. Also, more than half of the companies that never appeared in *EURO* did appear at least once in *RENT*. Even if the analysis is restricted to companies mentioned once in at least one of the four newspapers, a lot of variance remains to be explained—within a given newspaper and among the four of them. The regression analysis will allow assessing each newspaper's editorial policy, that is, the variables explaining the selection of the sample of news. Given that the left-hand-side variable is the number of articles published on a firm by a newspaper within a period, all regressions used a count model (Cameron and Trivedi 1986). To account for the overdispersion of the distribution, a negative binomial model is adopted.[31]

[30] The *Gini index* is the area between the Lorenz curve and the 45° line. At the extremes, the index is zero if all companies received the same share of media exposure and one if a single firm received all the media exposure.
[31] Poisson distributions fit better data with a value of the empirical mean close to the variance. A corollary is that Poisson models are better suited for stochastically independent events. The independence condition is barely met in our data. Analytical tests were run to discriminate among models.

Figure 3: Inequalities in the media exposure of 694 firms (Lorenz curves)



Source: authors' calculation

5. Dataset

The list of covariates is organized into three groups. The first includes variables summing up financial performance, the second adds controls for the firms' characteristics and the third consists of payments made by firms to newspapers.

Financial performance variables

Financial data came from the 1907–1909 stock exchange yearbooks and from daily or monthly stock price bulletins. Data were collected on firms with equity traded in Paris, either on the official stock exchanges or on the *coulisse* (over the counter).[32] The *market capitalization* (in log) was computed by multiplying the average equity prices with the number of outstanding shares. The *current yield* is the ratio of dividends paid in 1907 to the average stock price in 1907. The *stock price volatility* is proxy using the beta. It is computed as the division of the log of the ratio between the highest and lowest 1907stock price by the market average. Thus, the market beta is equal to one, and a beta value exceeding one indicates higher-than-average volatility. As for *liquidity,* although newspapers mentioned that it varied among stocks (e.g., "stock X was actively traded yesterday" while "there was not much demand for the stock of firm Y"), no data on the volume of transactions are available. Some stocks, however, were not or only irregularly negotiated. On those days, the official publications of the stock exchanges did not report any price for those stocks.[33] Assuming that the existence of a price quote on a given day reflected that some transactions were carried out, we construct an index for liquidity and attribute a value of one if a stock was quoted (and zero if not). Six evenly spaced dates in

[32] *Annuaire des valeurs admises à la cote officielle* and *Annuaire Desfossés*, respectively.
[33] Daily prices were taken from the *Tableau des titres cotés à la bourse de Paris et des cours moyens* (edited by *Direction générale de l'enregistrement, des domaines et du timbre*) for the official stock exchanges and in the *Cote du marché des banquiers* (edited by the *Syndicat des banquiers en valeurs au comptant près la bourse de Paris*) for the *Coulisse* market.

June 1907 were chosen to minimize potential endogeneity problems (as news exposure can impact liquidity).[34] The index ranges from zero to six. Table 3 sums up the main descriptive statistics.

Table 3: Summary statistics of financial variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
Capitalization (m francs)	694	38.7	117.0	12,000	1,820
Liquidity	694	2.74	246	0.00	6.00
Current yield in 1907 (%)	694	4.27	3.91	0.00	54.55
Beta	694	1.00	1.14	0.00	7.41

Source: authors' calculation

Firm characteristics

To account for legal differences in stocks trading on the two Parisian exchanges, we constructed a dummy variable *bourse* equal to one if a firm was listed on the official stock exchange and zero if it was on the *coulisse*. Companies were also classified along the following seven sectors: banks and insurance; railways; utilities; mining (other than coal); coal; 'new economy' (i.e., chemical industry, electricity, and carmakers); and metal work (typically steel). All other companies were aggregated into a category called 'other', which includes mainly printers, hotels and other tourism companies, and the food service industry. Table 4 gives the distribution of firms across sectors and shows that newspapers did not cover all sectors equally. *EURO* and *SEM* dedicated nearly a third of their stock review section to mining companies, whereas the two other periodicals devoted only 10%.

The selling of some stocks on the primary market is likely to have influenced the incentive of those companies to pay for coverage. We learn those companies using the statistics published by Alfred Neymarck in *Le Rentier*. The dummy takes the value of one if the company raised money on the market. In 1907, 60 companies sold securities on the official stock exchanges and 29 on the over-the-counter market. We used a dummy variable to account for the 209 firms registered outside of France. Its purpose is to capture the costs that a French investor would have paid to enforce his property rights in a foreign court of law. The dummy specification is especially suitable if investors' costs were mainly fixed costs. Finally, the dummy variable *colony* captures the effect of a firm operating in a colony, French or not (53 companies). The variable *distance* is measured between the capital of the country in which the firms operated their (main) business and Paris.[35] It was computed for non-French companies and for the 87 companies operated outside the country in which they were registered (mostly France, the United Kingdom, and Belgium). To account for the familiarity that investors might have felt toward some country, we (inversely) weighted distance by the country share in the total capitalization of the listed companies.[36]

[34] We chose Tuesday 4; Saturday 8; Wednesday 12; Monday 17; Friday 21; and Wednesday 26.
[35] When the information was not listed in *Annuaire Desfossés*, we relied on other investors' handbooks, such as Raffalovich's *Le marché financier* (various years), Houston (1897) Stephens (1907) or Dupont (1890).
[36] The reasoning is that, as the number of stocks from a particular country increases, the flow of information from that country to Paris also grows, making it seem less distant. This can either mean that a high flow of

Table 4: Statistics on sectors and firms receiving media exposure

	Banks and insurance	Railways	Utilities	Mining	Coal	New economy	Metal work	Other	*All samples*
Number of firms	115	56	96	119	46	94	67	101	*694*
Percentage of firms	16.6	8.1	13.8	17.1	6.6	13.5	9.7	14.6	*100.0*
Total market capitalization (m francs)	6,520.0	5,470.0	3,660.0	5,030.0	1,420.0	1,440.0	1,310.0	1,990.0	*26,840.0*
Average capitalization (m francs)	56.7	97.7	38.1	42.3	30.9	15.3	19.6	19.7	*387*
Average liquidity (range 0–6)	2.37	2.96	2.77	3.00	2.26	2.74	3.09	2.65	*2.73*
Average stock current return (%)	4.35	3.57	4.38	4.03	2.71	4.62	3.98	5.31	*4.27*
Average beta	0.54	0.46	0.65	1.96	0.87	1.24	0.95	0.89	*1.00*
Relative exposure in (%):									
- *EURO*	16.4	3.7	22.9	36.4	2.6	8.4	4.9	4.7	*100.0*
- *INTFIN*	16.2	10.5	21.4	10.3	4.6	7.6	19.7	9.9	*100.0*
- *RENT*	21.2	11.0	17.5	11.0	6.2	9.9	13.9	9.3	*100.0*
- *SEM*	20.4	8.1	15.	29.1	3.6	8.3	9.9	5.4	*100.0*

Source: authors' calculation. Relative exposure is the ratio of the number of exposures per sector to the total.

Payments to newspapers

Advertisements. The advertisement section included commercial announcements of new products or services such as railway fares, insurance company policies, the opening of a new branch by a given bank. Issuers of publicly traded securities also used it as a medium to inform the wider public on financial news, such as the introduction of a new security on the market or shareholders' meeting and also to announce the serial numbers of bonds drawn at the lottery for reimbursement. Both types of advertisements were counted by company and aggregated. The regressions used two specifications for this variable, either the actual number of ads or a dummy (equal to one) if the company advertised in the newspaper. As shown in Table 5, companies that advertised have, on average, a higher capitalization and a lower stock volatility than companies that did not advertise.

Table 5: Advertising *vs* non-advertising companies

	EURO		***INTFIN***		***RENT***		***SEM***	
	no ads	**ads**	**no ads**	**ads**	**no ads**	**ads**	**no ads**	**ads**
log-capitalization								
Obs.	624	70	520	174	588	106	521	173
Mean	6.91	7.64	6.91	7.22	6.87	7.62	6.90	7.24
Difference	−0.73***		−0.31***		−0.74***		−0.34***	
Yield								
Obs.	624	70	520	174	588	106	521	173
Mean	4.28	4.16	4.33	4.08	4.26	4.35	4.32	4.13
Difference	0.12		0.25		0.09		0.19	
Beta								
Obs.	624	70	520	174	588	106	521	173
Mean	1.02	0.82	1.08	0.75	1.06	0.67	1.10	0.70
Difference	0.20***		0.33***		0.39***		0.40***	

N = 694 firms, two-sample *t*-test with unequal variances; ***difference between means significant at 99% level.
Source: authors' calculation

information from a given country reduces the reluctance of investing abroad or that setting up the flow of information entails fixed costs. Using the standard measure of distance does not change the results.

Réclames. Investment banks provided firms several services such as financial advertisements, legal representation in France for foreign companies, and payment of coupons and dividends. Because financial yearbooks indicated which bank was appointed to pay a company's dividends and coupons, we were able to link banks and companies.[37] Table 6 presents the group averages of financial variables for all companies sharing the same partner bank.[38] The largest group (18%) consists of companies whose dividends were paid only at their Paris headquarters (aggregated in the dummy *paris_only*). Then come the three biggest deposit banks—Crédit Lyonnais, Société Générale, and Comptoir National d'Escompte de Paris—each with a market share of 9 to 10%. Another part of the market was shared among a handful of smaller investment banks with a market share of 1 to 6% (for a total of 39% of the firms). The banks that paid the dividend of less than three companies are aggregated in the dummy *small_only*. The regression also includes a dummy variable for companies that paid the dividend or coupon at their head office when it was located outside Paris (*no_paris*). The dummy *info_na* includes all companies for which the no information was available in public sources.

6. Results

This section reviews the determinants of media exposure and quantifies the importance of the media bias. Tables 7–10 give the regression results.[39]

The capitalization and liquidity are always positively correlated with the coverage. The measure of stock price variance is never significant, which could indicate that newspapers did not target liquidity traders but rather investors with a buy-and-hold strategy (*rentiers*). The significance or the sign of the other financial variables varies across newspapers, which can point that different groups of readers were targeted. Whereas *EURO* promoted firms with relatively high current returns, both *INTFIN* and *RENT* reported on those with lower returns. Two reasons can explain this. First, firms with a lower yield also feature a lower default risk (not measured in this regression). Second, a lower return implies a higher price/dividend ratio. Thus, *INTFIN* and *RENT* may have been focusing on 'blue chip' firms (i.e., those with high growth potential).[40] *EURO* tended to prefer firms listed on the

[37] The dummy variable *bank* was coded using *Annuaire Desfossés*. We departed from it only when we could document that a bank had a major stake in a company, in which case secondary sources were used. The stakes of Rothschild and Mirabaud in various companies were adjusted using Bencivengo (2004) and Chancelier (2001). In three instances we did aggregate banks when they appeared to be related through some ownership's links. First, we pooled Crédit Foncier de France (CFF) and Crédit Foncier et Agricole d'Algérie (CFAA) because (1) almost half of CFAA assets in 1907 were, in fact, financed through a loan from CFF; (2) they shared board members; and (3) CFAA's operations extended well beyond Algeria and were often unrelated to agricultural or real estate matters. It rather seems that CFAA was acting as another investment bank of CFF. Second, we merged the two banks controlled by Rochette. Third, we pooled the companies with dividends paid in the Paris office of the General Mining and Finance Corporation.

[38] Although group averages are calculated on the sample of firms, some are included in more than one group because they had more than one partner bank.

[39] Reported results use the sample of all news. The results are unaffected by the exclusion of negative news.

[40] Neymarck, the editor of *Le Rentier*, wrote in his investor's manual that 'a high price and a high dividend shall not be the only criteria when buying stocks' and urged investors to speculate by 'figuring out the perspective of the industry and the various reasons for which some stock could be underpriced' (1911, pp. 125–126).

coulisse, whereas the other three newspapers did not discriminate coverage against a given market. Moreover, except in *INTFIN*, a company selling new securities experienced a boost in its exposure.

The coverage of sectors also differed across newspapers. But after controlling for the firms' characteristics and performance, only a few had coverage that differed significantly from those of the coal sector. *INTFIN*, *RENT*, and *SEM* focused more on the metal industry, and *RENT* covered mining firms significantly less, which must be related with the repeated claim it made that too many fly-by-night entrepreneurs populated the mining industry for *rentiers* to hold a stake in them. This indicates that the varying degrees of exposure across and within newspapers reflected editorial choices.

The media exposure of firms incorporated abroad is negatively impacted. This is coherent with two explanations. Either foreign companies did not pay newspapers for write-ups of their activities or investors had a lower willingness to hold foreign stocks, for example, because they entailed higher enforcement costs.[41] This does not however imply that newspapers neglected the stocks of firms operating abroad but incorporated in France. With the exception of *INTFIN*, the sampled periodicals accommodated investors with significantly more coverage on firms operating abroad.

A newspaper's coverage could have been distorted either by the advertisements or by *réclames*. We discuss the effect of sequentially including these variables in the regressions (columns b and c). Only a few variables turn out insignificant because of their inclusion. In the dummy specification, advertising expenses always increased coverage. When advertisement is measured by the number of advertisements, it increased the media exposure in all newspapers except in *EURO*. But this count variable becomes significant even in *EURO* when any big advertiser (with more than 5% of all ads) is excluded of the sample.[42]

As shown by columns d and e, the *réclames* tended to biased coverage toward some subsets of firms. Out of 32 dummy variables *bank X*, only a few turn out to be significantly positive. Independence mattered as indicated by the positive significant sign of Crédit Mobilier in *INTFIN*. The companies linked to it also got significantly more coverage in *RENT* and SEM. It is noticeable that the dummy of Crédit Lyonnais, Société Générale and CNEP are never significantly positive. Combined with Billoret's (1969, pp. 402-3) finding that those biggest deposit banks were hugely involved in the business of securities' trading with the small investors/ depositors, this may indicated that their network of branches could have been a substitute for popularizing their business.[43] That the traditional investment bankers Neuflize, Mirabaud or Rothschild do not boost exposures is neither striking as their business model did not require popularizing to the general public the companies they had stakes in (Bonin, 2000, pp. 26-30). In contrast, companies linked to reputable investment bank Paribas (*BPPB*) got more exposures in the independent RENT but not in any other newspapers. Companies

[41] We also tried a specification in terms of distance between Paris and the country of incorporation. This variable was not significant in half the regressions, whereas the dummy always was. This could indicate that the costs of enforcing contracts abroad were of a 'fixed' nature rather than proportional to distance.
[42] This represents five companies in *EURO* and *SEM* and two companies in *INTFIN* and *RENT*.
[43] See also Dagneau (1975)

linked to the young BCI bank (created in 1901 by the former finance minister Rouvier) enjoyed more exposures than predicted by their performance in SEM. The same also holds for the companies linked to CIC in *EURO*, *SEM*, and *RENT.* Finally coverage in *EURO* and *SEM* is positively associated with two banks specialized in the mining industry, the GMFC, and the Rochette group. The negative sign of the mining sector in *RENT* disappeared once we controlled for the links with the Rochette group and GMFC. [44]

Two methods were used to gauge the impact on investors of biased editorial contents: (1) computing the marginal effect of the coefficient of the *bank X* dummies and (2) assessing whether this had a negative impact on investments by comparing observed and counterfactual portfolios. Table 12 shows the effect on predicted media exposure of the variation of each determinant of coverage. The predicted change in the number of write-ups in *EURO* would increase by 0.008 if the number of ads were to increase by half a standard deviation (i.e., 1.39 ads), holding all the other variables at their mean. The number of write-ups would actually increase by 0.228 if a company increased its number of ads from zero to 40 (the maximum). Similarly, if the average firm increased the number of its ads in *INTFIN* by half a standard deviation (or 0.98 ads), then its exposure would increase by 0.09, a marginal effect that is 12 times greater than that in the other newspapers.

We also look at the financial performance derived from the observed coverage and compare it to counterfactual coverage, in which firms purchase no advertising and/or no *réclames*.[45] Alternative asset allocations are assessed by assuming that investors followed a newspaper's content as a guideline when selecting their portfolios. Five portfolios were constructed using the following weights:

1. the firm's actual number of write-ups (portfolio are denoted *e* for *EURO*, *i* for *INTFIN*, *r* for *RENT*, *s* for *SEM*);

2. its positive write-ups (portfolios denoted *e*+, *i*+, *r*+, *s*+);

3. counterfactual write-ups, purging for the impact of advertising on coverage (*e*1, *i*1, *r*1, *s*1);

4. counterfactual write-ups, purging for the impact of *réclames* on coverage (*e*2, *i*2, *r*2, *s*2);

5. counterfactual write-ups, purging for the impact of both advertisings and *réclames* on coverage (*e*3, *i*3, *r*3, *s*3).

The positive news portfolio is the benchmark against which counterfactual portfolios are compared. Figure 4 plots the different combinations of stock price variance and current yield (which

[44] We also introduced interaction terms between the (significant) *bank X* dummies and the current yield. We expect that when the newspapers selected firms with good financial performance and linked to some bank, the interaction term will be significant and positive, whereas the significance of the bank dummy can disappear. Results show that this happens only for *CM* in *INTFIN*. The interaction variables of *GMFC* in *INTFIN* and *CIC* in *EURO* and *RENT* are significantly negative, whereas the bank dummies remain significant and positive. See table 13 of the working paper version.

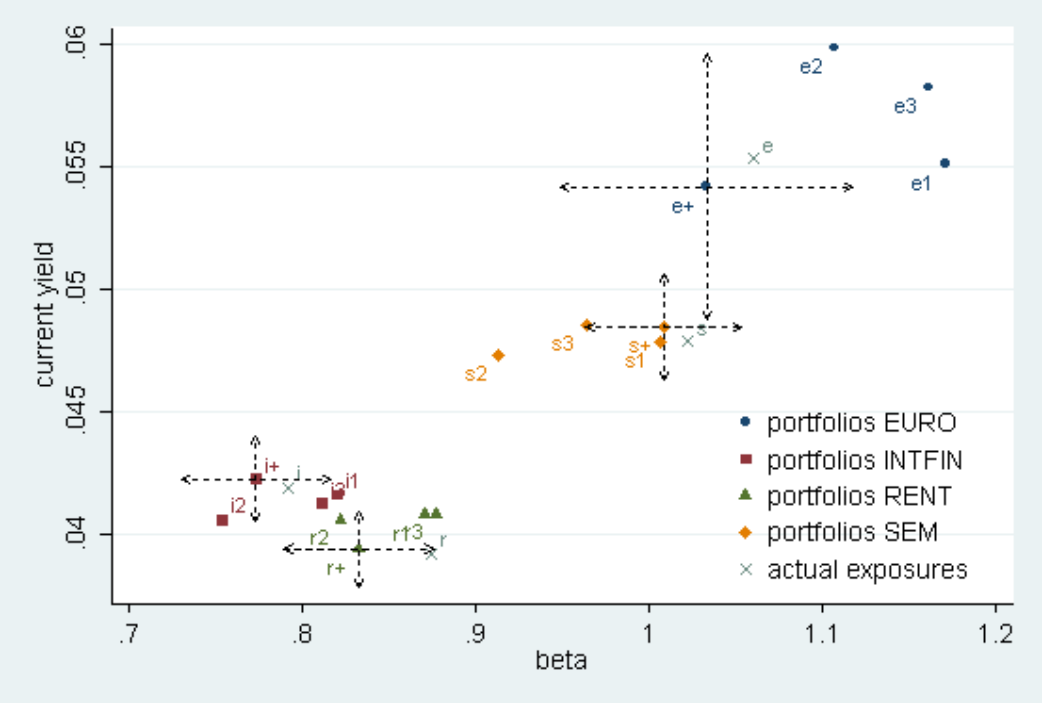
[45] Counterfactual scenarios were computed with the predicted number of write-ups a firm would have received if the corresponding variable were removed. We multiplied the estimated coefficients from regressions e of Tables 7–10 by a modified dataset in which the appropriate value of the variables were changed (e.g., changing the *Ads* dummy from one to zero when we wanted to simulate that firms did not advertise in that newspaper).

serve as proxies for risk and return) of these portfolios. The graph allows us to discuss the performance of the portfolios along two dimensions: across newspapers or, within each newspaper.

The comparison of the portfolios across newspapers shows that the performance of newspapers differed significantly. The ranking of positive portfolios behaved consistently with the mean-variance theory. *RENT* favoured stocks with a lower return, but also a lower risk, than those favoured by *EURO* or *SEM*. It behaves worse, however, than *INTFIN*, whereas *EURO* had, on average, the same level of risk but a much higher average return than *SEM*. *INTFIN* and *RENT* therefore seemed to target more risk-averse investors, whereas, *EURO* and *SEM*, in contrast, likely targeted risk-seeking readers. Because readers' preference for risk is not observable, such results can well reflect the market's segmentation along the degree of risk aversion. One conclusion, however, can be drawn: independent newspapers did not, per se, perform better than dependent bank-owned newspapers as shown by the comparison of *RENT* and *INTFIN*.

The effect of payments on the performance of the portfolios varied within newspapers. In *EURO*, removing the bias induced by payments increased significantly the return of the portfolio but also increased the risk (points *e1*, *e2*, and *e3* on figure 4). The effect is similar in *RENT* for portfolios *r2* and *r3* and in *INTFIN* for *s1* and *s3*. In contrast, in *SEM*, removing the impact of hidden payments on coverage (portfolio *s2*) lowered significantly the measure of risk and the average yield. Payments could then have had two opposite effects, depending on the newspaper. In *EURO*, *RENT*, and *INTFIN* payments lowered the risk and increased the return, whereas the reverse was true in *SEM*.

Figure 5: Performance of actual and counterfactual portfolios



Source: authors' calculation

As a robustness check, we compute the same type of portfolios without including in the sample the biggest advertisers (with more than 5% of Ads). Only the counterfactual portfolios of *EURO* and s2 of *SEM* remain significantly different from the benchmark. The others fall within the confidence interval. This suggests that, on average and except for the biggest payers, newspapers accepted payments from companies whose performance did not negatively impact investors.[46] In a nutshell, it seems that payments affected the coverage of individual companies but not the overall performance of newspapers' coverage. Hence although firms must have been concerned with payments, readers could have decided to pay little attention to their impact. Newspapers then reconciled the importance of deriving revenue from companies with the need to keep readers on board.

Finally, we check whether readers of *INTFIN* were hurt by the influence of its owner CM. To this end, we remark that if payments were used to swindle readers, one should expect *INTFIN* (1) to have pooled good-performing firms (not linked to CM) with poor-performing firms linked to CM and (2) to bias the coverage toward the firms linked to CM. In that case, the difference between the return of the portfolio with CM firms and the one without them must be positive. Consistently with the coefficient of the interaction variable, the computation shows that firms linked to CM increased the return of the portfolio by 7% in 1907. This suggests that *INTFIN* cared about its reputation and chose to highlight among firms linked to CM only those with good performance.

Table 12: The yield and risk of *INTFIN* portfolio with and without the companies linked to CM

	Current yield			Beta		
	With	Without	Difference	With	Without	Difference
1907	0.04186	0.03893	-7.00%	0.79176	0.79705	0.67%
1907, positive news only	0.04223	0.03917	-7.25%	0.77284	0.77649	0.47%
1908	0.04174	0.04054	-2.87%	0.67136	0.66440	-1.04%
1908, positive news only	0.04247	0.04128	-2.81%	0.65703	0.64822	-1.34%

Source: authors' calculation

7. Conclusion

This paper provided quantitative evidence on how four financial newspapers chose the information they published on listed firms in early-twentieth-century France. It shows that editors used varying financial criteria when choosing companies, thereby competing on various dimensions to attract readers. The results also show that the media were biased toward some subsets of companies but that this did not have a negative effect on their readers. Moreover, we have shown that independent newspapers were not the Holy Grail of unbiased information, because bank-owned newspapers did not underperform when compared to their independent counterparts. This stands in sharp contrast with the judgments of many observers writing at the time. The results also suggest that the newspaper market

[46] The discrepancy between this interpretation and Besley and Prat (2006) can be explained by the differences in the rationale of the payments. In Besley and Prat, payments can only suppress information (and, consequently, a newspaper accepts a payment if its value is larger than the induced loss in readership), whereas in pre–World War I France, payments were made for the publication of any type of news.

was segmented between risk-averse and risk-seeking investors and that the selection of the firms covered in the media varied according to the targeted readership. Notice that the increasing digitalisation of newspapers' content will allow future research to broaden the sample of newspapers tested and consequently to assess the generic character of our results.

Although each conclusion is not surprising in itself, the broader picture that they suggest is that the importance of media bias was clearly overemphasized in the historical literature and that the dissemination of information on listed companies must have undoubtedly contributed to the development of the financial markets. The payments to newspapers could, however, have a negative impact, notably because of the transaction cost they imposed on listed firms. In particular, following the literature on corruption, small firms, those that were not able to afford paying the numerous intermediaries involved in the information market, certainly suffered from the peculiarities of the process through which information made its way into the newspapers. We let to future research the estimation of this possible impact of media bias on the overall stock market performance.

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Table 6: Statistics per group of firms sharing the same investment bank

Bank	Number of firms	Share of firms (%)	Average capitalization (m. francs)	Average Liquidity	Average Current yield	Average Beta
Société Générale (*sg*)	85	12.25	37.8	3.62	3.67	0.77
Crédit Lyonnais (*cl*)	83	11.96	56.8	3.18	4.80	0.74
Comptoir National d'Escompte de Paris (*cnep*)	72	10.37	41.2	3.40	3.82	0.81
Crédit Industriel et Commercial (*cic*)	52	7.49	40.5	3.52	3.84	0.74
Paribas (*bppb*)	51	7.35	61.3	3.90	4.40	1.10
Banque Française Commerce et Industrie (*bci*)	28	4.03	22.4	2.61	3.72	1.04
Société Marseillaise (*sm*)	22	3.17	24.4	3.86	4.19	1.16
Banque de l'Union Parisienne (*bup*)	18	2.59	30.8	3.11	4.38	1.19
Crédit Foncier de France and Crédit Foncier Agricole Algérien (*cff_cfaa*)	17	2.45	26.4	3.53	3.33	1.06
Crédit Mobilier (*cm*)	15	2.16	6.9	2.47	5.85	1.07
Compagnie Algérienne (*Cal*)	15	2.16	13.5	3.07	7.20	0.93
Compagnie des Mines d'Or d'Afrique du Sud (*Cmas*)	14	2.02	37.5	3.50	2.65	1.42
Banque Suisse et Française (*Bsf*)	14	2.02	6.8	2.50	3.87	0.69
Mirabaud (*Mira*)	11	1.59	33.7	3.91	4.55	0.94
Banque Impériale Royale Priv. Autrichienne (*Irp*)	9	1.30	46.3	1.67	3.52	1.01
Rothschild (*Roth*)	9	1.30	215.0	5.11	4.38	1.12
Bénard et Jarikowsky banquiers (*Bj*)	8	1.15	43.5	4.62	3.00	0.61
Banque Transatlantique (*bt*)	7	1.01	37.1	3.71	3.82	0.43
Banque Privée Lyon Marseille (*bp*)	5	0.72	12.2	3.60	4.98	0.39
Banque Espagnole du Commerce (*bec*)	5	0.72	41.5	3.00	2.33	0.60
Banque de l'Indochine (*indo*)	5	0.72	23.0	2.60	4.18	0.82
Rochette (*Roch)*	5	0.72	8.9	1.20	2.52	1.45
Caisse Commerciale et Industrielle de Paris (*Ccip*)	5	0.72	2.6	1.60	4.20	0.71
Banque Impériale Ottomane (*Bio*)	4	0.58	144.0	4.25	3.20	1.03
Banque Propper (*Prop*)	4	0.58	13.8	0.75	3.49	0.35
General Mining and Finance Corporation (*Gmfc*)	4	0.58	15.9	0.25	4.09	2.81
Consolidated Goldfields of South Africa (*Cgsa*)	4	0.58	108.0	4.50	3.79	1.85
MM Périer et cie (*Peri*)	4	0.58	41.6	3.25	4.32	0.42
MM Roumagnac et cie (*Rouma*)	4	0.58	8.5	1.00	4.17	1.06
De Neuflize (*Neuf*)	4	0.58	37.8	5.00	6.00	1.20
Société Française de Reports et Deports (*Sfrd*)	4	0.58	9.1	2.00	5.17	1.70
Dividend at firm's Paris office (*paris_only*)	161	23.20	48.9	2.38	4.46	0.90
Dividend paid in a small bank (*small_only*)	56	8.07	30.4	2.25	4.42	1.14
Dividend at the firm's office outside Paris (*no_paris*)	15	2.16	10.6	1.00	3.19	1.81
info_na	19	2.74	26.7	1.74	2.55	2.19

Table 7: Negative binomial regressions when dependent variable is exposure in *EURO*

VARIABLES	[a] euro	[b] euro	[c] euro	[d] euro	[e] euro	VARIABLES	[d contd] euro	[e contd] euro
liquidity	0.246***	0.243***	0.222***	0.282***	0.260***	sm	0.31	0.103
	[4.78]	[4.71]	[4.13]	[6.15]	[5.49]		[0.48]	[0.18]
log_capit	1.253***	1.193***	1.122***	1.193***	1.118***	bp	-22.406***	-21.273***
	[6.89]	[6.28]	[6.00]	[6.22]	[5.87]		[-30.56]	[-29.55]
current_yield7	3.556*	3.483*	3.175	5.525***	5.110**	cm	-0.157	-0.351
	[1.74]	[1.72]	[1.49]	[2.64]	[2.31]		[-0.20]	[-0.48]
beta7	-0.051	-0.05	-0.064	-0.126	-0.131	cmas	0.621	0.531
	[-0.39]	[-0.38]	[-0.49]	[-1.27]	[-1.34]		[1.18]	[1.02]
foreign	-1.512***	-1.508***	-1.546***	-0.954**	-0.907**	irp	0.693	0.795
	[-3.28]	[-3.29]	[-3.43]	[-2.51]	[-2.44]		[0.92]	[1.11]
colony	-1.675***	-1.703***	-1.641***	-1.326**	-1.311**	roth	-0.532	-0.418
	[-3.03]	[-3.07]	[-2.96]	[-2.23]	[-2.11]		[-0.93]	[-0.67]
log_adj_dist	0.191***	0.192***	0.196***	0.148***	0.150***	bj	-1.320**	-0.9
	[4.77]	[4.81]	[5.02]	[4.27]	[4.41]		[-2.06]	[-1.32]
bourse	-1.308***	-1.296***	-1.392***	-1.024***	-1.074***	cal	0.553	0.509
	[-3.76]	[-3.73]	[-4.07]	[-3.07]	[-3.30]		[0.63]	[0.59]
i_banks	0.465	0.423	0.057	0.213	-0.008	bec	-22.190***	-21.318***
	[0.83]	[0.76]	[0.10]	[0.36]	[-0.01]		[-35.62]	[-32.20]
i_utilities	0.982*	0.967*	1.042*	0.966	1.084*	bt	-0.609	-0.633
	[1.68]	[1.66]	[1.80]	[1.57]	[1.81]		[-1.08]	[-1.11]
i_mines	0.014	0.034	0.031	-0.134	-0.112	bsf	-0.098	-0.145
	[0.03]	[0.06]	[0.05]	[-0.23]	[-0.19]		[-0.09]	[-0.13]
i_railways	-0.68	-0.865	-1.172*	-0.449	-0.642	bio	-23.285***	-21.510***
	[-1.05]	[-1.28]	[-1.76]	[-0.66]	[-0.95]		[-29.96]	[-28.25]
i_neweco	0.336	0.338	0.25	0.218	0.191	indo	0.818	0.667
	[0.56]	[0.57]	[0.42]	[0.35]	[0.32]		[0.90]	[0.67]
i_metal	0.406	0.403	0.38	0.426	0.474	prop	-20.507***	-19.666***
	[0.66]	[0.66]	[0.62]	[0.67]	[0.76]		[-20.69]	[-19.92]
i_other	-0.118	-0.119	-0.171	0.18	0.2	gmfc	2.367***	2.234***
	[-0.21]	[-0.21]	[-0.30]	[0.30]	[0.33]		[3.81]	[3.59]
intro_bourse	0.901**	0.874**	0.797*	0.651**	0.574*	roche	2.770***	2.689***
	[2.35]	[2.18]	[1.76]	[2.16]	[1.84]		[4.96]	[4.34]
intro_coulisse	0.148	0.14	0.133	-0.579	-0.607	mira	-1.475	-1.57
	[0.27]	[0.26]	[0.24]	[-1.24]	[-1.34]		[-1.11]	[-1.08]
count_ads		0.045		0.036		ccip	-19.631***	-17.091***
		[1.29]		[1.41]			[-18.21]	[-17.52]
dum_ads			1.065***		0.932***	cgsa	-0.105	-0.048
			[3.71]		[3.33]		[-0.23]	[-0.10]
bup				0.312	0.219	peri	0.402	0.147
				[0.66]	[0.48]		[0.56]	[0.22]
cic				0.693*	0.663*	rouma	-21.348***	-20.469***
				[1.88]	[1.73]		[-26.73]	[-25.82]
bci				-0.331	-0.461	neuf	-1.496*	-1.658**
				[-0.59]	[-0.80]		[-1.78]	[-2.33]
cl				-0.576**	-0.541**	sfrd	-21.050***	-20.080***
				[-2.11]	[-2.00]		[-24.44]	[-23.24]
sg				-0.048	-0.142	small_only	0.011	-0.003
				[-0.17]	[-0.51]		[0.02]	[-0.01]
cff_cfaa				0.504	0.569	paris_only	-0.692*	-0.691*
				[0.66]	[0.72]		[-1.84]	[-1.86]
bppb				-0.108	-0.209	no_paris	-2.121***	-2.110***
				[-0.34]	[-0.66]		[-3.80]	[-3.64]
cnep				-0.082	-0.296	info_na	0.243	0.109
				[-0.26]	[-0.91]		[0.42]	[0.18]
Constant	-11.133***	-10.711***	-10.127***				-10.875***	-10.273***
	[-7.73]	[-7.26]	[-6.94]				[-7.05]	[-6.68]
Observations	694	694	694				694	694
LR_chi2	222	226.5	237.1				7204	6518
prob>LR_chi2	0.00	0.00	0.00				0.00	0.00
log_lik negbin	-503.2	-502.5	-498.1				-472.1	-468.6
log_lik poisson	-727.9	-722.7	-713.6				-593.4	-584.3
McFadden's R2	0.139	0.141	0.148				0.193	0.199
alpha	3.283	3.244	3.056				2.12	1.997
chi2_alpha	449.4	440.5	430.9				242.7	231.5
prob>chi2_alpha	0.00	0.00	0.00				0.00	0.00

Robust z-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Negative binomial regressions when dependent variable is exposure in *INTFIN*

VARIABLES	[a] intfin	[b] intfin	[c] intfin	[d] intfin	[e] intfin	VARIABLES	[d contd] intfin	[e contd] intfin
liquidity	0.221***	0.203***	0.190***	0.219***	0.203***	sm	-0.447	-0.356
	[6.33]	[5.71]	[5.69]	[7.27]	[6.57]		[-1.39]	[-0.99]
log_capit	1.011***	0.959***	0.966***	1.127***	1.103***	bp	-0.066	0.094
	[7.98]	[7.16]	[7.81]	[9.31]	[9.18]		[-0.08]	[0.11]
current_yield7	-0.654	-1.12	-1.446	-5.429**	-5.127**	cm	2.325***	2.040***
	[-0.29]	[-0.51]	[-0.66]	[-2.51]	[-2.33]		[6.45]	[5.92]
beta7	-0.001	-0.001	-0.008	-0.049	-0.052	cmas	-1.341	-1.312
	[-0.01]	[-0.02]	[-0.09]	[-0.63]	[-0.67]		[-1.27]	[-1.23]
foreign	-0.778**	-0.790***	-0.731**	-0.965***	-0.902***	irp	0.551	0.611
	[-2.38]	[-2.62]	[-2.50]	[-2.72]	[-2.76]		[1.17]	[1.25]
colony	-0.455	-0.422	-0.444	-0.481	-0.565	roth	0.287	0.261
	[-1.20]	[-1.18]	[-1.29]	[-1.17]	[-1.51]		[0.84]	[0.76]
log_adj_dist	0.026	0.032	0.029	0.043	0.044	bj	-0.922*	-0.697
	[0.85]	[1.16]	[1.08]	[1.29]	[1.46]		[-1.91]	[-1.37]
bourse	-0.023	-0.015	-0.035	-0.026	-0.026	cal	0.247	0.273
	[-0.09]	[-0.06]	[-0.16]	[-0.12]	[-0.12]		[0.70]	[0.73]
i_banks	-0.507	-0.539	-0.503	-0.559	-0.47	bec	0.334	0.297
	[-1.32]	[-1.35]	[-1.27]	[-1.49]	[-1.20]		[0.87]	[0.74]
i_utilities	0.494	0.433	0.137	0.610*	0.421	bt	0.151	-0.003
	[1.28]	[1.18]	[0.36]	[1.74]	[1.18]		[0.51]	[-0.01]
i_mines	-0.52	-0.412	-0.299	-0.123	-0.019	bsf	0.291	0.426
	[-1.38]	[-1.07]	[-0.73]	[-0.32]	[-0.05]		[0.51]	[0.74]
i_railways	-0.221	-0.372	-0.492	-0.063	-0.194	bio	0.005	-0.37
	[-0.58]	[-0.96]	[-1.22]	[-0.16]	[-0.50]		[0.02]	[-1.12]
i_neweco	-0.336	-0.262	-0.218	0.13	0.167	indo	0.436	0.551
	[-0.91]	[-0.72]	[-0.55]	[0.35]	[0.44]		[1.04]	[1.33]
i_metal	0.769**	0.753**	0.643*	0.895**	0.825**	prop	-19.98***	-18.729***
	[2.13]	[2.15]	[1.74]	[2.52]	[2.24]		[-25.13]	[-24.85]
i_other	-0.171	-0.088	-0.075	0.247	0.302	gmfc	1.215***	1.289***
	[-0.49]	[-0.25]	[-0.20]	[0.68]	[0.79]		[3.60]	[3.75]
intro_bourse	0.412*	0.26	0.145	0.252	0.199	roche	-19.506***	-18.845***
	[1.67]	[1.02]	[0.63]	[1.20]	[0.99]		[-31.16]	[-30.73]
intro_coulisse	-0.057	-0.009	0.042	-0.118	-0.108	mira	-0.505	-0.446
	[-0.14]	[-0.02]	[0.11]	[-0.35]	[-0.34]		[-1.11]	[-0.92]
count_ads		0.265		0.08		ccip	-1.042	-0.657
		[1.12]		[1.60]			[-0.88]	[-0.60]
dum_ads			1.097***		0.762***	cgsa	-0.652	-0.516
			[6.82]		[4.97]		[-1.32]	[-1.03]
bup				0.178	0.075	peri	0.216	0.227
				[0.50]	[0.19]		[0.83]	[0.72]
cic				0.370*	0.341*	rouma	0.882	0.968
				[1.83]	[1.65]		[0.89]	[0.99]
bci				0.289	0.178	neuf	0.409	0.192
				[0.91]	[0.55]		[0.56]	[0.33]
cl				0.085	0.101	sfrd	0.908**	0.884**
				[0.47]	[0.53]		[2.09]	[2.01]
sg				-0.097	-0.025	small_only	0.301	0.436
				[-0.58]	[-0.14]		[1.03]	[1.49]
cff_cfaa				-0.908*	-0.414	paris_only	-0.359*	-0.316
				[-1.84]	[-1.06]		[-1.74]	[-1.52]
bppb				0.136	0.114	no_paris	0.102	0.234
				[0.54]	[0.49]		[0.16]	[0.38]
cnep				0.082	0.005	info_na	-0.637	-0.55
				[0.41]	[0.03]		[-1.29]	[-1.19]
Constant	-7.647***	-7.403***	-7.566***				-8.674***	-8.715***
	[-8.67]	[-8.14]	[-8.90]				[-10.03]	[-10.30]
Observations	694	694	694				694	694
LR_chi2	356.4	330	459				2687	2749
prob>LR_chi2	0.00	0.00	0.00				0.00	0.00
log_lik negbin	-927.6	-918.2	-901.9				-872.9	-864.3
log_lik poisson	-1230	-1212	-1156				-1051	-1016
McFadden's R2	0.108	0.117	0.133				0.161	0.169
alpha	1.804	1.733	1.503				1.169	1.082
chi2_alpha	604.4	587	508				357.1	303.8
prob>chi2_alpha	0.00	0.00	0.00				0.00	0.00

Robust z-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 9: Negative binomial regressions when dependent variable is exposure in *RENT*

VARIABLES	[a] rent	[b] rent	[c] rent	[d] rent	[e] rent	VARIABLES	[d contd] rent	[e contd] rent
liquidity	0.196***	0.190***	0.167***	0.176***	0.158***	sm	0.421*	0.365
	[8.45]	[8.21]	[7.22]	[7.91]	[7.21]		[1.73]	[1.48]
log_capit	0.890***	0.821***	0.703***	0.750***	0.695***	bp	-0.444	-0.314
	[10.27]	[8.90]	[7.57]	[8.07]	[7.98]		[-0.80]	[-0.57]
current_yield7	-3.487**	-3.125*	-3.229**	-4.703**	-4.710**	cm	0.665**	0.701**
	[-1.97]	[-1.89]	[-2.33]	[-2.34]	[-2.53]		[2.32]	[2.45]
beta7	0.01	0.009	-0.009	-0.023	-0.026	cmas	-1.468***	-1.389***
	[0.16]	[0.15]	[-0.14]	[-0.36]	[-0.43]		[-3.88]	[-3.67]
foreign	-0.389*	-0.388*	-0.292	-0.586***	-0.426**	irp	0.654	0.659
	[-1.80]	[-1.82]	[-1.37]	[-2.62]	[-2.01]		[1.61]	[1.60]
colony	-0.157	-0.164	-0.089	-0.078	-0.066	roth	0.413	0.27
	[-0.63]	[-0.67]	[-0.37]	[-0.30]	[-0.26]		[1.18]	[0.78]
log_adj_dist	0.053***	0.055***	0.045**	0.055***	0.047**	bj	-0.912**	-0.859**
	[2.60]	[2.75]	[2.28]	[2.62]	[2.36]		[-2.19]	[-2.10]
bourse	-0.017	-0.02	-0.15	-0.162	-0.225	cal	-0.227	-0.358
	[-0.11]	[-0.13]	[-0.99]	[-1.04]	[-1.51]		[-0.96]	[-1.52]
i_banks	-0.108	-0.166	-0.19	-0.05	-0.014	bec	0.341	-0.047
	[-0.50]	[-0.77]	[-0.90]	[-0.24]	[-0.07]		[0.78]	[-0.12]
i_utilities	0.331	0.279	0.279	0.348*	0.391*	bt	0.011	-0.023
	[1.48]	[1.24]	[1.21]	[1.65]	[1.85]		[0.03]	[-0.05]
i_mines	-0.852***	-0.850***	-0.747***	-0.391	-0.316	bsf	-0.458	-0.284
	[-3.48]	[-3.50]	[-3.13]	[-1.64]	[-1.37]		[-1.50]	[-0.91]
i_railways	0.037	-0.04	-0.125	-0.05	-0.029	bio	-0.161	-0.509*
	[0.14]	[-0.15]	[-0.50]	[-0.20]	[-0.12]		[-0.42]	[-1.66]
i_neweco	-0.078	-0.087	-0.084	0.145	0.166	indo	-1.091***	-0.835**
	[-0.33]	[-0.37]	[-0.37]	[0.63]	[0.75]		[-3.25]	[-2.44]
i_metal	0.527**	0.519**	0.538**	0.570***	0.626***	prop	-0.24	-0.2
	[2.46]	[2.45]	[2.53]	[2.86]	[3.17]		[-0.28]	[-0.23]
i_other	-0.231	-0.272	-0.263	-0.09	-0.031	gmfc	-1.289**	-1.215*
	[-1.06]	[-1.27]	[-1.28]	[-0.43]	[-0.15]		[-2.05]	[-1.77]
intro_bourse	0.599***	0.595***	0.524***	0.480***	0.435***	roche	-18.748***	-19.938***
	[4.57]	[4.47]	[4.01]	[3.55]	[3.31]		[-34.92]	[-37.88]
intro_coulisse	0.33	0.327	0.373	0.179	0.245	mira	-0.209	0.036
	[1.08]	[1.07]	[1.22]	[0.59]	[0.83]		[-0.59]	[0.09]
count_ads		0.032**		0.035***		ccip	-0.797**	-0.589*
		[2.38]		[3.17]			[-2.10]	[-1.69]
dum_ads			0.816***		0.698***	cgsa	-19.68***	-20.824***
			[6.68]		[5.41]		[-33.38]	[-35.83]
bup				0.504**	0.275	peri	0.476***	0.394
				[2.06]	[1.16]		[3.49]	[1.49]
cic				0.316**	0.315**	rouma	0.247	0.148
				[2.16]	[2.20]		[0.40]	[0.25]
bci				-0.038	-0.094	neuf	0.415	0.236
				[-0.16]	[-0.41]		[0.70]	[0.55]
cl				0.057	0.055	sfrd	0.245	0.37
				[0.44]	[0.43]		[1.09]	[1.54]
sg				-0.041	-0.065	small_only	-0.326	-0.275
				[-0.34]	[-0.53]		[-1.35]	[-1.16]
cff_cfaa				-0.125	-0.019	paris_only	-0.486***	-0.435***
				[-0.30]	[-0.06]		[-2.95]	[-2.71]
bppb				0.363**	0.253	no_paris	0.179	0.163
				[2.23]	[1.59]		[0.46]	[0.42]
cnep				0.06	0.019	info_na	-2.149***	-2.111***
				[0.40]	[0.13]		[-3.72]	[-3.61]
Constant	-6.553***	-6.066***	-5.178***				-5.374***	-5.025***
	[-10.00]	[-8.76]	[-7.36]				[-7.81]	[-7.81]
Observations	694	694	694				694	694
LR_chi2	393.2	389.8	503.8				3398	3833
prob>LR_chi2	0.00	0.00	0.00				0.00	0.00
log_lik negbin	-1122	-1119	-1103				-1071	-1060
log_lik poisson	-1350	-1343	-1278				-1194	-1165
McFadden's R2	0.119	0.12	0.133				0.159	0.167
alpha	0.925	0.909	0.787				0.632	0.564
chi2_alpha	456.9	446.2	348.8				245.3	209.3
prob>chi2_alpha	0.00	0.00	0.00				0.00	0.00

Robust z-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 10: Negative binomial regressions when dependent variable is exposure in *SEM*

VARIABLES	[a] sem	[b] sem	[c] sem	[d] sem	[e] sem	VARIABLES	[d contd] sem	[e contd] sem
liquidity	0.233***	0.229***	0.217***	0.249***	0.238***	sm	-0.909**	-0.999***
	[6.30]	[6.39]	[5.84]	[7.35]	[7.07]		[-2.32]	[-2.64]
log_capit	1.382***	1.266***	1.317***	1.284***	1.330***	bp	-1.927*	-1.913
	[10.09]	[9.56]	[9.59]	[9.33]	[9.90]		[-1.74]	[-1.52]
current_yield7	0.663	1.115	1.073	2.174	2.282	cm	1.203***	1.184**
	[0.38]	[0.65]	[0.60]	[1.49]	[1.53]		[2.67]	[2.51]
beta7	0.014	-0.01	0.023	-0.002	0.013	cmas	1.183**	1.181**
	[0.13]	[-0.10]	[0.22]	[-0.03]	[0.14]		[2.30]	[2.31]
foreign	-0.682*	-0.547*	-0.640*	-0.353	-0.37	irp	0.763	0.885
	[-1.85]	[-1.74]	[-1.87]	[-1.05]	[-1.08]		[1.24]	[1.41]
colony	-0.826*	-0.68	-0.722	-0.162	-0.167	roth	0.237	0.081
	[-1.78]	[-1.53]	[-1.55]	[-0.37]	[-0.37]		[0.61]	[0.21]
log_adj_dist	0.071**	0.062**	0.067**	0.031	0.031	bj	-0.109	-0.047
	[2.02]	[2.01]	[2.01]	[1.08]	[1.05]		[-0.18]	[-0.08]
bourse	-0.51	-0.388	-0.486	-0.398	-0.416	cal	-0.296	-0.388
	[-1.57]	[-1.26]	[-1.53]	[-1.15]	[-1.17]		[-0.75]	[-0.91]
i_banks	-0.142	-0.107	-0.173	0.019	-0.001	bec	0.573	0.463
	[-0.41]	[-0.32]	[-0.49]	[0.05]	[-0.00]		[1.25]	[1.05]
i_utilities	0.674*	0.55	0.602	0.576	0.636*	bt	-0.361	-0.496
	[1.79]	[1.44]	[1.52]	[1.54]	[1.72]		[-0.62]	[-0.81]
i_mines	0.074	0.277	0.252	0.162	0.215	bsf	-1.409*	-1.488**
	[0.18]	[0.72]	[0.62]	[0.42]	[0.55]		[-1.92]	[-2.04]
i_railways	0.178	0.079	0.02	0.179	0.158	bio	0.14	-0.004
	[0.42]	[0.19]	[0.05]	[0.38]	[0.33]		[0.32]	[-0.01]
i_neweco	0.29	0.235	0.229	0.219	0.245	indo	-0.742	-0.911
	[0.69]	[0.59]	[0.58]	[0.60]	[0.67]		[-0.87]	[-1.08]
i_metal	0.39	0.466	0.46	0.588*	0.625*	prop	-0.774	-0.966
	[1.06]	[1.29]	[1.20]	[1.71]	[1.76]		[-0.68]	[-0.91]
i_other	-0.088	-0.017	-0.029	0.217	0.277	gmfc	1.609***	1.620***
	[-0.20]	[-0.04]	[-0.06]	[0.51]	[0.64]		[3.59]	[3.66]
intro_bourse	0.436*	0.385	0.401	0.455*	0.472*	roche	1.775***	1.826***
	[1.76]	[1.44]	[1.49]	[1.80]	[1.85]		[2.75]	[2.72]
intro_coulisse	-0.462	-0.589	-0.534	-0.603	-0.604	mira	-0.171	-0.051
	[-0.93]	[-1.27]	[-1.13]	[-1.23]	[-1.26]		[-0.27]	[-0.08]
count_ads		0.076**		0.046**		ccip	0.323	0.246
		[2.38]		[2.55]			[0.50]	[0.40]
dum_ads			0.540***		0.456***	cgsa	-0.485	-0.504
			[2.90]		[2.84]		[-0.92]	[-0.96]
bup				-0.805**	-0.971***	peri	0.081	0
				[-2.12]	[-2.82]		[0.24]	[0.00]
cic				0.413*	0.335	rouma	-0.279	-0.266
				[1.80]	[1.46]		[-0.24]	[-0.23]
bci				0.753**	0.694*	neuf	-0.51	-0.689
				[1.99]	[1.86]		[-0.78]	[-1.07]
cl				0.07	0.041	sfrd	0.483	0.51
				[0.33]	[0.19]		[0.74]	[0.79]
sg				-0.301	-0.374*	small_only	-0.335	-0.353
				[-1.41]	[-1.76]		[-1.12]	[-1.25]
cff_cfaa				-0.015	0.017	paris_only	-0.375	-0.407
				[-0.04]	[0.05]		[-1.25]	[-1.35]
bppb				0.055	0.004	no_paris	-0.425	-0.436
				[0.22]	[0.01]		[-0.92]	[-0.93]
cnep				-0.001	-0.052	info_na	0.443	0.417
				[-0.00]	[-0.21]		[1.09]	[1.02]
Constant	-10.345***	-9.686***	-10.050***				-9.924***	-10.287***
	[-9.49]	[-9.27]	[-9.24]				[-9.19]	[-9.70]
Observations	694	694	694				694	694
LR_chi2	344.4	324.5	333.4				495.6	524.9
prob>LR_chi2	0.00	0.00	0.00				0.00	0.00
log_lik negbin	-1028	-1023	-1023				-991.7	-990.9
log_lik poisson	-1668	-1658	-1641				-1416	-1410
McFadden's R2	0.107	0.111	0.111				0.138	0.139
alpha	2.432	2.343	2.349				1.85	1.842
chi2_alpha	1279	1269	1236				849.5	839.2
prob>chi2_alpha	0.00	0.00	0.00				0.00	0.00

Robust z-statistics in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Predicted change for selected variables, based on regression [d] of the respective newspaper.

	variable	min -> max	-+sd/2	Marginal Effect		variable	min -> max	-+sd/2	Marginal Effect
EURO	liquidity	0.1344	0.0465	0.0185	RENT	liquidity	1.0162	0.3834	0.1544
	log_capit	0.9889	0.0561	0.0784		log_capit	4.7299	0.4621	0.6578
	current_yield	1.0056	0.0142	0.3633		current_yield	-0.9892	-0.1614	-4.1228
	foreign	-0.0539	-0.0290	-0.0627		foreign	-0.4641	-0.2367	-0.5141
	log_dist_adj	0.4170	0.0554	0.0097		log_dist_adj	1.1164	0.2690	0.0484
	count_ads	0.2129	0.0066	0.0024		count_ads	2.3790	0.0973	0.0307
	cic	0.0624				cic	0.3183		
	gmfc	0.6270				cm	0.8161		
	roche	0.9642							
INTFIN	liquidity	0.7582	0.2772	0.1112	SEM	liquidity	1.4601	0.5206	0.2080
	log_capit	6.5729	0.4082	0.5730		log_capit	15.4667	0.7705	1.0735
	current_yield	-0.6080	-0.1081	-2.7605		current_yield	1.7321	0.0711	1.8178
	foreign	-0.4208	-0.2270	-0.4905		foreign	-0.2766	-0.1357	-0.2952
	log_dist_adj	0.4679	0.1205	0.0217		log_dist_adj	0.5340	0.1456	0.0262
	count_ads	11.6682	0.0793	0.0408		count_ads	2.5156	0.1203	0.0382
	cic	0.2214				bci	0.9115		
	cm	4.4623				cm	1.8984		
	gmfc	1.1967				cmas	1.8480		
	sfrd	0.7489				gmfc	3.3105		
						roche	4.0439		