# Regulating Conflicts of Interest: The Effect of Sanctions and Enforcement*

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**Abstract.** This paper studies how legal sanctions and enforcement affect brokers' conflicts of interest emanating from investment banking activities. We exploit the recent adoption of the Market Abuse Directive (MAD) across European countries and use the variation in legal sanctions and enforcement that exists in Europe to identify brokers' reaction. Overall, the enactment of MAD significantly reduced optimistic investment advice. This reduction is larger in countries equipped with more severe legal sanctions and in countries that strongly enforce the rules. Our analysis underscores the importance of legal sanctions and enforcement power to understand the real consequences of regulatory changes.

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## 1. Introduction

Over the past decades, securities firms and their analysts have often been accused of producing overly optimistic research to attract and retain investment banking clients. Given the central role that analysts play in disseminating information across market participants and guiding investment decisions, regulatory agencies have taken corrective actions. As part of a large effort to better protect consumers and to restore trust in financial markets, several national regulators have designed new rules aiming to curb conflicted equity research and improve the overall quality of analysts' output (e.g., Mehran and Stulz, 2007, for a survey). As with any new law the effectiveness of security regulations depends on how the new rules are designed, but also crucially on the associated legal sanctions and their practical enforcement (e.g., La Porta et al., 2006; Coffee, 2007; Jackson and Roe, 2009). In a period characterized by unprecedented regulatory uncertainty, better understanding the real consequences of regulatory changes and the role played by sanctions and enforcement turns out to be of paramount importance.

To shed new light on this question, we examine how legal sanctions and enforcement power affect the nature and magnitude of the conflicts of interest emanating from brokers' investment banking activities. We do so by exploiting a recent regulatory change in the European Community (EC). In 2003, the European regulators decided to enact the Market Abuse Directive (MAD). Aiming to reorganize European financial markets, this regulation includes several provisions targeted to curb conflicts of interest in equity research. Similarly to U.S. rules (e.g., Kadan et al., 2009), MAD limits the relationship between research and investment banking departments, and creates stringent disclosure requirements on the nature of such relationships (Directive 2003/125). These changes in the European regulatory landscape allow us to provide novel evidence on the interplay between the severity of legal sanctions, enforcement and the behavior of financial analysts. Indeed, due to the absence of full legal harmonization across European countries, the enforcement of MAD's provisions and the sanctions in case of violations remain ultimately in the hands of national authorities. Hence, while the new rules apply equally in all Member States, the penalties and the actual enforcement vary across countries. We use this heterogeneity to empirically separate the role of sanctions and enforcement from the change in rules. In addition, while all EC Member States were required to adopt

MAD, they did so at different points in time. For instance, Germany implemented MAD in October 2004, the U.K did it in July 2005 but Portugal only enacted it in March 2006. Such a staggering in the implementations of the *same* regulation is helpful to isolate the effect of MAD on conflicts of interest from confounding factors such as other contemporaneous events or general time trends.

Our empirical analysis proceeds in two steps. First, we evaluate the impact of the new European regulation on the extent of conflicted equity research. Second, we examine whether the observed changes in analysts' behavior depend on the severity of the associated legal sanctions and the strength with which regulators enforce new rules. To do so, we focus on the dynamics of stock recommendations issued by brokerage houses around the European regulatory change. To identify the presence of conflicts of interest, we rely on the exact provision of the European Directive that states that any recommendation made by (an analyst working for) a broker on a firm for which it has acted as underwriter or adviser over the last twelve months is considered as being exposed to conflicts of interest. We label these recommendations as *affiliated*. Across a large sample of recommendations made on stocks listed in thirteen European countries between 1997 and 2007 (261,260 recommendations), we document that affiliated brokers issued recommendations that were on average more optimistic than their peers in the pre-regulation period. While "Sell" and "Strong Sell" account for 18% of non-affiliated recommendations before MAD, they only represent 7% of the recommendations issued by affiliated brokers. Likewise, the proportion of "Buy" and "Strong Buy" is significantly larger for affiliated (60%) than for non-affiliated (46%). Similarly to what has been documented in the U.S., these descriptive results suggest that recommendations issued by affiliated brokers on European companies were tainted by conflicts of interest before the adoption of MAD.[1]

We then show that the passage of the Directive has significantly mitigated the effect of conflicts of interest on equity research. After MAD, the distribution of recommendations issued by affiliated brokers is much less skewed towards favorable recommendations. The proportion of "Sell" and "Strong Sell" increases to 10%, while the proportion of "Buy" and "Strong Buy" decreases to 51%. In contrast, we observe virtually no change in the recommendations of non-affiliated brokers.

[1] Note that the distribution of recommendations from affiliated brokers appears more balanced in Europe than in the U.S. (e.g., Ertimur et al., 2006; Kadan et al., 2009).

We confirm these patterns using a multivariate analysis that controls for various determinants of analysts' optimism. To measure the over-optimism bias of affiliated brokers, we focus on their *relative* recommendation, that is, the difference between their recommendation and the consensus recommendation. Across all countries, we estimate that the over-optimism bias of affiliated brokers almost vanishes following the adoption of MAD. Extensive robustness tests support this conclusion as well as the validity of our identification strategy. This first set of results indicates that the impact of the European Directive resembles that of the Regulation Fair Disclosure (RegFD) in 2000, the Sarbanes-Oxley Act (section 501), and the Global Analyst Research Settlement in 2002 adopted earlier in the U.S.[2]

Next, we exploit the unique cross-country dimension of our sample and estimate the effect of MAD on the over-optimism bias of affiliated brokers for each country separately. This analysis highlights two notable insights. First, in the pre-MAD period, the magnitude of the affiliated brokers' bias varies considerably across countries. For instance, while affiliated brokers exhibit almost no sign of over-optimism in Belgium, the affiliation bias appears particularly strong in Austria and the U.K. Second, we observe an important heterogeneity in the mitigating impact of MAD among European countries. The reduction of the over-optimism bias of affiliated brokers ranges from 50% in Sweden to more than 100% in Portugal, where affiliated brokers became slightly (over-) pessimistic.

We find that this heterogeneity is related to the severity of the legal sanctions that are specifically applicable in cases of violations of MAD. In particular, we gather specific information on the potential sanctions brokers face in each country in cases of violations of MAD articles. For each country, we aggregate the relevant pecuniary administrative sanctions and criminal sanctions, including imprisonment and fines, to construct an index of sanction "severity" that goes along with the implementation of MAD. We document that the effect of MAD is significantly stronger in countries where MAD's sanctions are strong. After MAD, the over-optimism of affiliated brokers is virtually eliminated in countries equipped with severe sanctions (e.g. Ireland or France) but only decreased by

[2] Mehran and Stulz (2007) survey the literature on conflicts of interest in the financial analysis industry and the effects of the U.S. reforms within the sell-side research industry. Recent research questions whether the conflicts have switched to the brokerage side (e.g., Chung and Teo, 2011).

around 70% in the countries where sanctions are milder (e.g. Scandinavian countries). To alternatively measure the importance of legal sanctions, we use two other measures of sanctions severity. Notably, we find that the impact of MAD is stronger in countries where market supervisors are granted more power and in countries where criminal sanctions for financial misconduct are more severe.

We also uncover that the strength with which each country enforces its securities laws matters. In sharp contrast with the U.S., the EC almost exclusively relies on *public* enforcement (e.g., La Porta et al., 2006; Coffee, 2007). On this ground, we use resource-based proxies to capture the level of countries' public enforcement intensity from Jackson and Roe (2009) and estimate that the reduction of conflicts of interest in the aftermath of MAD is larger when countries allocate more resources to their financial supervisors. This is true when we consider the budget countries dedicate to financial supervision or the size of the staff working for supervisors. Similarly, we find that affiliated brokers decrease their over-optimistic recommendations much more in countries that rank high on the index of public enforcement intensity developed by La Porta et al. (2006). Even though the provisions of MAD apply similarly to each European country, our cross-country results suggest that affiliated brokers perceive the effective risk associated with a violation to vary from one country to another, and adjust their behavior accordingly.

This paper contributes to the literature in several ways. First, we add to the literature on conflicts of interest of sell-side equity analysts and the impact of legal attempts to mitigate these conflicts. Similar to the outcomes of comparable U.S. regulations, our results highlight that financial analysts reduced their over-optimism regarding investment banking clients after the passage of the European regulation. We emphasize that the observed changes in the behavior of analysts are directly linked to the sanctions and enforcement power that accompany the new rules. As such, our cross-country analysis suggests that the efficacy of imposing new rules to tackle conflicts of interest rests on the severity of the sanctions imposed in case of violations and the power with which regulators enforce the rules. These results have important implications for the expected outcomes of future regulatory reforms and the efforts to harmonize regulation across countries.

While the idea that legal sanctions and public enforcement affect financial outcomes is not new, the extant evidence has so far remained quite limited. La Porta et al. (2006), and Jackson and Roe

(2009) establish that the strength of public enforcement explains countries' *aggregate* outcomes such as countries' market capitalization, trading volume, IPO activity, or the aggregate coverage of financial analysts. Bhattacharya and Daouk (2002) provide important *microeconomic* evidence by showing that firms' cost of capital only decreases after the first enforcement of insider trading regulation. Subsequent papers use the same metric to estimate other microeconomic consequences of enforcement (e.g., Hope, 2003; Bushman et al., 2005). Our paper brings three novelties to the law and finance literature. First, we show that the strength with which countries enforce their laws has a material impact on the incentives of brokers to produce biased research. Second, we develop a specific index of legal sanctions and show that, like enforcement power, the severity of the legal sanctions that accompany the new European regulation largely matters in explaining regulatory outcomes. Third, because we examine a regulation whose provisions *equally* apply across several countries, our methodology can precisely isolate the effect of enforcement and sanctions from other effects originated from differences in regulatory rules.[3] Our analysis underscores the need to distinguish between new rules, and their practical enforcement, to properly understand the outcomes of financial regulations.

Finally, we provide new evidence on the functioning of the financial analysis industry in Europe. Existing research has concentrated on studying the U.S. markets (e.g., Barber et al., 2006; Kadan et al., 2009). We are the first, to the best of our knowledge, to document large-scale evidence on the existence of conflicted equity research due to investment banking ties in Europe.[4] Interestingly, despite substantial differences in markets organization and participation, our analysis underscores that the nature and magnitude of conflicted equity research in Europe appear to be very similar to what has been observed in the U.S.

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[3] In a contemporaneous and complementary paper, Christensen et al. (2011) examine the impact of MAD and the recent Transparency Directive (TD) on market liquidity and firms' cost of capital.

[4] Two other papers suggest the existence of conflicts of interest in Europe. Using around 6,000 stock recommendations, Bessler and Stanzel (2009) report that brokers acting as underwriter in German IPOs issue over-optimistic recommendations. Using around 8,000 recommendations, Carapeto and Gietzmann (2011) document the presence of conflicted stock recommendation in the U.K.

In the next section, we provide details on the institutional setting of MAD. Section 3 describes the sample and outlines the empirical methodology. Section 4 presents the average impact of MAD on the recommendations of affiliated brokers. Section 5 reports cross-country results highlighting the importance of legal sanctions and enforcement. Section 6 concludes.

## 2. The Market Abuse Directive

### 2.1. THE INSTITUTIONAL FRAMEWORK

In 1999, the European Commission launched the Financial Services Action Plan with the aim of promoting a fully integrated European financial market. To this end, several directives were adopted, among which the Directive 2003/6/EC on "*Insider Dealing and Market Manipulation*". This Directive is known as the *Market Abuse Directive* or MAD. As a European directive and national laws banning insider trading existed prior to MAD, the real novelty of the new Directive was to improve existing rules on insider trading, ameliorate their enforcement, and extend their reaches.[5] In particular, MAD was complemented by two further Commission Directives, CD 2003/124/EC and CD 2003/125/EC that specifically impose new rules related to the investment recommendations issued by financial analysts.[6] By and large, European securities legislations did not give a large scope to the potential market manipulation by financial analysts before the adoption of MAD. This feature underscores that the (marginal) regulatory impact is probably large on the European financial analysis industry.

The objectives of MAD regarding financial analysts are twofold. First, MAD intends to preclude selective disclosures of information. A corporate manager disclosing relevant information *"…must make complete and effective public disclosure of that information, simultaneously in the case*

[5]The first European prohibition of insider trading came with a Directive in 1989 (Council Directive Coordinating Regulations on Insider Trading, 1989 O.J. (C277) 13). Before 1989, several countries among which the U.K. and France (but not Germany) had national laws banning insider trading.

[6] See Ferrarini (2004) and Hansen (2004). Investment recommendations are also submitted to Directive 2004/39/EC and Commission Directive CD 2006/73/EC, known as MiFID, whose main objective is to increase consumer protection in investment services. Several articles include investment research activities. In particular, conflicts of interest are the subject of the Directive (article 18).

*of an intentional disclosure and promptly in the case of a non-intentional disclosure*" (Directive 2003/6/EC, article 6.3). Relevant information means price-sensitive information, i.e. "*information which, if it were made public, would be likely to have a significant effect on the price*" (CD2003/124, article 1).

Second, MAD harmonizes standards for the "*fair, clear and accurate presentation of information and disclosure of interests and conflicts of interest*".[7] In order to make financial analysts accountable for their recommendations, the identity of the people who prepared the recommendation, i.e. their name and job title, and the name of the person legally responsible for the recommendation, must be disclosed. Therefore, recommendations made by teams of analysts without mentioning their names are implicitly forbidden. Facts must be clearly distinguished from opinions and interpretations, and estimates, which include forecasts and price targets, must be labeled as such. The methodology used to evaluate financial instruments must also be described. In addition to the time horizon and risk, the date at which the recommendation was released must be prominently indicated. Interestingly, any change in a recommendation that was issued during the last twelve months must be clearly stated. Furthermore, financial institutions providing recommendations are required to disclose every quarter the proportion of "Buy", "Hold" and "Sell" recommendations issued for all stocks they follow.

To limit the pernicious consequences of potential conflicts of interest, the European regulator adopted a pragmatic strategy. To make investors aware of potential conflicts, MAD requires the disclosure of any relevant information that might potentially affect the nature of the recommendation. Financial institutions are also required to disclose the "*effective organizational and administrative arrangements set up […] for the prevention and avoidance of conflicts of interest*" (CD2003/125, article 6.2). They must report on how the remuneration of the person preparing the recommendation is tied to investment banking transactions. Any person involved in the production of the recommendation must disclose her links with the recommended firm. Brokers having acted as a lead manager or co-lead manager in any securities offerings (stocks and bonds) or having advised the recommended firm in

[7] Official Journal of the European Community, December 24th, 2003, L339/73.

M&As over the twelve months preceding the recommendation must disclose this information.[8] Finally, disclosure must be made if the financial institution recommending a firm holds a stake of 5 or more in the capital of the recommended firm or, conversely, if the recommended firm holds a stake of 5 or more in the capital of the financial institution.

On many dimensions, the provisions of MAD resemble those of related regulations (RegFD, NASD Rule 2711, NYSE Rule 472 and SOX501) adopted earlier in the U.S. Overall, the European and American regulations impose disclosure of information helping to understand research outputs and identify potential conflicts of interest. There are, however, a few notable differences. MAD does not make any reference to the individual protection of financial analysts from people involved in investment banking activities working for the same financial institution. Nor does it refer to the educational level of financial analysts, or to the ban on reviewing the report before publication is made on companies that are the subject of the research report. Also, NASD Rule 2711 and NYSE Rule 472 do not mention holdings (a stake of 5) as a source of conflict whereas MAD does.

Before becoming legally binding, European directives must be incorporated into national laws. This process depends on the constitution of each country and is often quite lengthy. In the context of MAD, Germany amended it in its national law on October 30th, 2004, but most Member States transposed MAD into national laws during the second semester of 2005 (i.e. Belgium, Finland, France, Ireland, Italy, Netherlands, United Kingdom and Spain) and the first semester of 2006 (Portugal). While the terms of MAD apply equally to all countries, their enforcement and the associated legal sanctions remain ultimately in the hands of national authorities. The Directive 2003/6/EC (article 14) states that "…*without prejudice to the right of Member States to impose criminal sanctions, Member States shall ensure, in conformity with their national law, that the appropriate administrative measures can be taken or administrative sanctions be imposed*". Therefore, Member States and national parliaments decided independently on the sanctions in case of violation of the law. In 2008, the Committee of European Securities Regulators (CSER) wrote a "*Report on Administrative Measures and Sanctions as well as the Criminal Sanctions available in Member States under MAD*".

[8] Note that this categorization is identical to SOX501, sec.15d, b), 3).

This report highlights substantial differences in administrative and penal sanctions across countries.[9] The European Commission considered that "…*there are significant differences and a lack of convergence across the EU in terms of the sanctions available for market abuse as well as the application of those sanctions. At present sanctions are simply too weak in some Member States and lead to the risk of weak enforcement and even regulatory arbitrage*". In practice, analysts communicating biased advice and accused of market manipulation face very different penalties depending on where they are prosecuted. For example, for a similar violation, a pecuniary administrative sanction is capped to 30'000 Euros in Austria, 96'000 Euros in the Netherlands but is not capped in the U.K. In cases of biased advice and market manipulations, analysts face the threat of imprisonment of up to twelve years in Italy, ten in Ireland but none in Finland. In the following analysis, we exploit this source of variation to highlight the important role played by legal sanctions and enforcement in shaping the behavior of financial analysts.

## 2.2. WHAT IS THE RELEVANT JURISDICTION?

While the heterogeneous implementation of MAD across countries helps to precisely identify the effect of the regulation, it also introduces an important legal challenge. Indeed, because financial services are global, brokers located in one country can issue recommendations on firms that are listed in a different country. This possibility underscores the importance to properly identify the jurisdiction that is responsible to enforce the provisions of MAD. To understand why, consider the following example. An analyst who works for Barclays Bank in London issues a recommendation on L'Oreal, which is headquartered and listed in France. What is the relevant jurisdiction in case of broker's wrongdoing? Practically speaking, the answer to this question is not given ex-ante.[10] In fact, the

[9] This report is available at http://www.cesreu.org/index.php?page=document_details&id=4975&from_id=22. Recently, the European Commission opened a public consultation in order to revise MAD. One of the topics under the spotlights is the enhancement of the powers of competent authorities to investigate market abuse and the introduction of effective and deterrent sanctions. Except minor differences, it is fair to say that the "law on the books" in the EC (i.e. MAD) is an imitation of the U.S. regulations. However, sanctions and enforcements are extremely different either between US and EC or within the EC.

[10] On January 23rd, 2009, the EC Commission created the Committee of European Securities Regulators whose main missions are defined in CD2009/77, article 4: "*The Committee shall enhance cooperation between national supervisory*

relevant jurisdiction depends on the identity of the plaintiff and more importantly on the jurisdiction where the complaint is filed. If for instance an investor thinks that he has been misled by biased recommendations on L'Oreal made by the Barclays' analyst, she can file a complaint with the English regulator (e.g. the Financial Services Authority (FSA)), with the French regulator (e.g. the Autorité des Marchés Financiers), or both.

In practice, however, procedures are habitually initiated with the regulator of the country where the firm (whose price has been manipulated) has its primary listing. Recent anecdotal evidence confirms that regulators take actions targeted against *foreign* actors. For example, FSA recently fined a Canadian firm for alleged abusive trading. The FSA acting director of enforcement and financial crime said that "*The FSA remains committed to tackling abuse of the U.K. markets – wherever it originates*". Similarly, in 2004 a French (commercial) court convicted Morgan Stanley for market manipulation, because one of their London-based analysts had issued biased (negative) recommendations to help its investment client, Gucci Group, the biggest rival of Louis Vuitton Moet Hennessey SA (LVMH). Ruling that the research provided by Morgan Stanley significantly defamed the French luxury group, the French court ordered Morgan Stanley to pay 30 million Euros to LVMH.[11]

On this ground, we consider that the relevant jurisdiction is that of the country where the recommended firm is listed. With this definition, when a broker (or its subsidiary) issues a recommendation on a firm that is under the authority of the same regulator, e.g. when Société Générale (France) issues a recommendation on L'Oréal (France), the general principle of "territoriality" applies. The local (French) supervisor is in charge of investigating the complaint and enforcing MAD's rules. In contrast, when the broker and the firm are not under the supervision of the same national authority, e.g. when an analyst working for Barclays in London (U.K.) issues a recommendation on L'Oréal (France), we retain that the enforcement takes place in the country where

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*authorities in the securities field and foster the convergence of Member States 'supervisory practices and approaches throughout the Community*" and "*…develop new practical convergence tools to promote common supervisory approaches*".

[11]See for instance "FSA Fines Trading Firm £8 Million", by Tim Cave, *Wall Street Journal*, August 31st, 2011, or "LVMH Battles Against Morgan Stanley in Court", by John Tagliabue, *New York Times*, November 18th, 2003, or "LVMH Pursues Morgan Stanley for Damages", by Adam Jones, *Financial Times*, April 5th 2005.

the firm is listed, i.e. in France. While debatable, we show in an Internet Appendix that this choice is justified empirically.

## 3. Data and Methodology

### 3.1. SAMPLE CONSTRUCTION

To identify the presence of potential conflicts of interest and analyze the impact of the new regulation, we look at the nature of analysts' recommendations. We focus specifically on stock recommendations rather than on earnings forecasts because stock recommendations were the focal point of many complaints of conflicts of interest and because conflicted equity research primarily takes place via biased recommendations rather than through biased earnings' forecasts (e.g., Malmendier and Shanthikumar, 2009). To measure the marginal impact of the new regulation, we also require stock recommendations to be issued on firms that share similar regulatory environment *before* the introduction of MAD.

On this basis, our initial sample consists of all stock recommendations on the firms listed in fifteen EC Member States, i.e. Austria, Belgium, Denmark, Finland, France, Germany, United Kingdom, Ireland, Italy, the Netherlands, Portugal, Spain and Sweden. We exclude recommendations on firms from Greece and Luxemburg because of their poor data coverage. We cover a period that starts January 1st, 1997 and ends on December 31th, 2007. Local firms listed on these markets represent more than 99% (97%) of the market capitalization at the beginning (end) of our sample period. We use the June 2008 version of I/B/E/S International Historical Detail File.[12] We eliminate firms if the country of their primary listing is different from the country where they are incorporated. I/B/E/S reports ratings from 1 ("Strong Buy") to 5 ("Strong Sell"). To make the rating system more intuitive,

[12] Ljungqvist et al. (2009) mention that versions of the I/B/E/S U.S. Historical Detail File database released before February 2007 are exposed to 1) deletion and addition and 2) alteration. No study reports similar evidence for the I/B/E/S International Historical Detail File. Even, if I/B/E/S adopted the same policy for the U.S. and the international versions, the impact of additions is reduced since we eliminate recommendations issued by the same broker and clustered in time (more than 200 for a single day). Alterations do not affect our research because we do not observe brokers tweaking their rating scale. Our sampling design minimizes these hypothetical biases. In addition, since our data set was downloaded in June 2008, the data are free from the above problems.

we reverse the scale (5 for "Strong Buy" and 1 for "Strong Sell") so that higher ratings correspond to more favorable recommendations. We further exclude recommendations with missing information on the firm (country or currency codes) or the broker. Kadan et al. (2009) notice that, after 2002, some U.S. brokers adopted a three-tier scale rating system in place of the five-tier scale they used previously. They report an unusual number of recommendations made by these brokers on the days where they switched to the new rating system. As we identify a similar pattern in Europe, we exclude recommendations issued on such days.[13]

In line with the provisions of MAD, conflicts of interest originate in the existence of investment business ties between recommended firms and brokers. To identify such ties, we gather information on European IPOs, SEOs, debt issuance and M&As from the Security Data Company's (SDC) database. In particular, we collect the names of book-runners, managers and co-managers, the amount and the date at which transactions took place. We use the I/B/E/S broker name associated with the broker masked code and manually match the names of the book-runner(s), manager(s), co-manager(s) and advisor(s) in the SDC database. To complement our classification, we use Nelson Directories to determine which recommendations were issued by independent research firms (with no brokerage business and no investment banking business). We find no recommendations made by such firms in our sample. Finally, to gauge and provide the most accurate evaluation of the European regulation, we define investment business ties by following the exact provisions of MAD. Therefore, any financial institution that issues a recommendation on a firm for which it has acted as an underwriter (SEO, IPO or public debt issuance) or a M&A advisor over the last twelve months is considered as "affiliated" (CD2003/125, article 6, al. 1d). We use this definition to classify each recommendation as *Affiliated* versus *Non-Affiliated*.

As a matter of fact, the whole process leading to MAD was first initiated before 2003 by the adoption of codes of ethics at the national and international levels, followed by European Commission

[13] We identify thirteen individual brokers that made more than two hundred recommendations on one single day. This happens seventeen times over our sample period. A closer look shows that six of them correspond to those reported in Kadan et al. (2009, Table 2). The remaining ones occurred more recently (three in 2003, two in 2004, one in 2005, four in 2006 and two in 2007) and we suspect backfilling Therefore, the corresponding recommendations are excluded.

Directives and, eventually, by the transposition of these directives into national laws. Since the enforcement of the law is ultimately country-specific, we retain the date at which the corresponding law was enacted in each country. This choice is rather conservative as it makes it more difficult to detect any effect of the regulation.

### 3.2. EMPIRICAL METHODOLOGY

To appraise the impact of MAD on brokers' conflict of interest, we follow Ljungqvist et al. (2007), and Loh (2009) and examine the effects of brokers' affiliation on their *relative* recommendation, that is, on the difference between their recommendation and the consensus recommendation. On this ground, we use the following baseline difference-in-differences regression specification:

$$\text{Optimism}_{b,i,c,t} = \boldsymbol{\alpha} + \gamma_0 \text{Affiliated}_{b,i,c,t} + \gamma_1 \text{MAD}_{c,t} + \gamma_2 [\text{Affiliated}_{b,i,c,t} \times \text{MAD}_{c,t}] + \boldsymbol{\Gamma}' \mathbf{X}_{b,i,c,t} + \varepsilon_{b,i,c,t} \qquad (1)$$

where the subscripts *b*, *i*, *c* and *t* represent respectively the broker, the covered firm, the country where the firm is incorporated and the date of the recommendation release. The dependent variable, $\text{Optimism}_{b,i,c,t}$ is the recommendation issued by broker *b* on stock *i* (of country *c*) at time *t*, minus the consensus recommendation across all brokers covering stock *i* at time *t*, except broker *b*. We compute the consensus using the most recent recommendation issued by each broker and exclude recommendations issued more that twelve months prior to the current recommendation. Moreover, we require a minimum of five recommendations to compute a meaningful consensus. As outlined by Ljungqvist et al. (2007), relative recommendations provide a direct metric to assess whether a broker is optimistic, pessimistic, or neutral compared to peer brokers who issued recommendations on the same stock. Affiliated is a dummy that equals one for recommendations made by brokers classified as affiliated and zero otherwise. Hence, the coefficient $\gamma_0$ measures whether affiliated brokers are optimistic ($\gamma_0 > 0$) or pessimistic ($\gamma_0 < 0$) relative to non-affiliated brokers. If affiliated brokers favor the companies with which they do investment banking business, we expect this coefficient to be

positive. The variable $MAD_c$ equals one after MAD has been enacted in country *c* and zero otherwise. The corresponding coefficient identifies the regulatory shock. To account for broker's heterogeneity, country and time specific effects, we include a set of broker, country, and time fixed effects ($\boldsymbol{\alpha}$).

Also, in line with empirical studies on stock recommendations, Equation (1) includes variables that control for other potential time-varying determinants of brokers' optimism (**X**). First, since large institutions may have more resources to support research and may have better access to private information, we control for the size of the broker based on the number of companies followed over the past twelve months preceding the recommendation release (log(#Firms covered)). Then, to capture a stock's information environment, we include the number of brokers who issued at least one recommendation on the stock over the past twelve months preceding the recommendation release (log(#Analysts)). To further capture the potential impact of differential information environments, we also consider whether a recommendation has been issued by another broker in the ten days preceding the recommendation release (Herding) and whether an earnings announcement occurs in the two days before the recommendation (CER). We also include a dummy variable (Initiation) that equals one the first time a broker issues a recommendation on a specific firm and zero otherwise. Finally, to account for the fact that brokers may become optimistic about a stock because it has performed well or because of market-wide optimistic sentiment, we include the stock return (Prior Firm Return) as well as the local market return (Prior Market Return) computed over the twelve months preceding the recommendation (e.g., Jegadeesh et al., 2004; Kadan et al., 2009). We detail the construction of all the variables in the Appendix. We further adjust estimated standard errors for within-broker error clustering and heteroskedasticity.

The coefficient of interest in Equation (1) is on the interaction between *Affiliated* and *MAD* ($\gamma_2$). To wit, this coefficient measures whether there is a difference between the relative recommendations of affiliated and unaffiliated brokers (first difference) before and after MAD (second difference). As such, if MAD contains provisions that effectively limit the effects of conflicts of interest inherent in investment banking relationships we should observe that affiliated brokers behave more like unaffiliated brokers after the introduction of MAD, corresponding to a reduction of the affiliation bias ($\gamma_2 < 0$). Importantly, our identification strategy exploits the staggered implementation

of MAD across European countries to precisely isolate the impact of the new regulation on conflicted equity research. Panel B of Table I (Column 2) outlines the dates at which each country implemented MAD. The different timing of the implementation across countries mitigates concerns that market-wide changes, macroeconomic shocks, or other regulatory events confound the impact of MAD on brokers' behavior. Because the translation of the directive (same text) was adopted in different countries in different periods, it also mitigates concerns that often arise about the endogeneity of the regulation and the timing of its adoption (e.g., Ball, 1980; Mulherin, 2007). Moreover, our set of fixed effects captures any time-invariant unobserved heterogeneity across brokers, countries and periods.

## 4. The Impact of MAD on Conflicts of Interest

### 4.1. UNIVARIATE RESULTS

Table I reports descriptive statistics for our sample of European stock recommendations. Overall, the sample covers 261,260 recommendations issued by 224 brokers (pure brokerage houses and investment banks) on 3412 firms. The U.K., Germany, and France account for 65% of the covered firms and 61% of the recommendations. Table I also presents the proportion of recommendations by ratings (Strong Buy, Buy, Neutral, Sell, and Strong Sell). Consistent with Jegadeesh and Kim (2006), the distribution is right skewed with 18% of "Strong Buy" and 28% of "Buy" recommendations compared to 13% of "Sell" and 5% of "Strong Sell". Notably, the number of firms, brokers and recommendations, seems rather stable over our sample period. A quick comparison with similar U.S. figures indicates that the distribution of recommendations appears significantly more balanced in Europe. More specifically, "Sell" and "Strong Sell" in the U.S. represent 3% (e.g., Jegadeesh and Kim, 2006) to 6% (e.g., Howe et al., 2009) of the recommendations as opposed to 18% in our sample.

[Insert Table I about here]

Table II details the characteristics of stock recommendations by type of brokers. In Panel A, we note that the proportion of recommendations issued by affiliated brokers represents 2 (5,752 recommendations out of 261,260). These recommendations were issued by 97 different brokers (88 before and 64 after MAD), which issued 77% of the recommendations in our sample (76% before and 67% after MAD). The proportion of recommendations issued by affiliated brokers is not substantially

affected by the enactment of MAD either. While the fraction of recommendations issued by affiliated brokers represented 2% before MAD, it slightly increased to 3% after MAD. Panel A also indicates that this proportion has been stable over time, ranging from 1% to 3% per year. The proportion of recommendations issued by affiliated brokers in Europe resembles that reported in U.S. studies. In particular, Malmendier and Shanthikumar (2009, Table I) report that affiliated brokers[14] produce 5% of all U.S. recommendations. When we extend the definition of affiliation period from a one-year (as defined in MAD) to a three-year period, a definition more in line with previous U.S. research, this proportion increases to 5%. Consistently, the proportion of recommendations issued by brokers who never participated in investment banking activities represents 23% in our European sample as compared to 15% in the U.S. as shown by Cowen et al. (2006), or Ertimur et al. (2006).

[Insert Table II about here]

When we specifically focus on affiliated brokers in the pre-MAD period (Table II, Panel A), we note that the distribution of their recommendations clearly suggests the presence of conflicted research. Indeed, while "Sell" and "Strong Sell" account for 18 of non-affiliated recommendations, they only represent 8% of the recommendations issued by affiliated brokers. Likewise, the proportion of "Buy" and "Strong Buy" is larger for affiliated (58%) than for non-affiliated (46%). We observe a comparable pattern for all years preceding the enactment of MAD. For affiliated brokers, however, the distribution of their recommendations changes after the enactment of MAD. The proportion of "Sell" and "Strong Sell" recommendations increases to 11%, whereas the proportion of "Buy" and "Strong Buy" decreases to 51%. We do not see a similar shift for non-affiliated brokers (18/47 for unfavorable/favorable recommendations).

Panel B further breaks down the distribution of recommendations by country. We observe cross-country differences in the fraction of affiliated recommendations. They range between 5% in Austria and 1.5% in Finland. However, no specific country appears to host the bulk of affiliated brokers.

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[14] Malmendier and Shantikumar (2009) define a brokerage firm as *affiliated* if it has been a lead or co-underwriter for a firm's IPO in the past five years or for a firm's SEO in the past two years.

4.2. MULTIVARIATE RESULTS

We start our regression analysis by examining the average effect of MAD on brokers' recommendations. Table III displays results from OLS estimations of Equation (1). The first column reports the OLS results of the baseline specification. Confirming the above descriptive figures, we observe that the coefficient on affiliated brokers (Affiliated) is positive and significant. After controlling for other determinants of relative optimism, the average affiliated broker issued relative recommendations that are 0.243 (*t*-statistic of 11.02) higher on a scale that ranges between one and five before MAD. Similarly to what has been documented on U.S. markets (e.g., Mehran and Stulz, 2007), strong investment banking ties also generated more aggressive stock recommendations in Europe during the pre-MAD era. Overall, the control variables display signs that are in line with related studies (e.g., Ljungqvist et al., 2007; Loh, 2009).

[Insert Table III about here]

Looking at the impact of MAD, we notice that its enactment significantly lessened the optimism bias of affiliated brokers. Indeed, the coefficient on Affiliated×MAD is negative and significant (-0.213 with a *t*-statistic of 6.74). In terms of economic magnitude, this represents an 88 reduction in the affiliation bias. An *F*-test of the overall effect of affiliation after MAD reveals that the passage of MAD eliminates the over-optimism of affiliated brokers almost completely (0.243 - 0.213 = 0.030, statistically not different from zero at 28%). By limiting relations between research and investment banking departments and by establishing stringent disclosure requirements, the provisions of MAD have markedly modified the behavior of affiliated brokers in Europe.

It is also interesting to see that MAD, by itself, had no significant effect on the level of unaffiliated stock recommendations. This results suggests that the observed decrease in the over-optimism of affiliated brokers really comes from the fact that affiliated brokers issue less optimistic recommendations after MAD, and not because unaffiliated brokers became more optimistic. A univariate analysis focusing only on the firms recommended by affiliated brokers largely confirms this fact. Indeed, in the pre-MAD period, the average recommendation of affiliated brokers was 3.78 while the average consensus was 3.56 (the difference of 0.22 reflects the over-optimism bias of affiliated

brokers). In the post-MAD period, the average recommendation of affiliated brokers drops to 3.60. Yet, the average consensus is 3.58 after MAD, which corroborates that our results are driven by the changed behavior of affiliated brokers.

We verify that our results are robust to our definition of Optimism and Affiliation. In columns 2 and 3 of Table III, we modify the definition of the consensus. In column 2, we compute the consensus using recommendations from peers' brokers over the six months that precede a recommendation instead of a year. In column 3, we require at least ten outstanding recommendations in order to compute the consensus. Indeed, one potential concern is that with a small number of outstanding recommendations, the timing of their releases can substantially affect our measure of *relative* optimism.[15] In column 4 of Table III, we classify as affiliated any recommendation made by a broker on a firm for which it has acted as underwriter or adviser over the last three years. Arguably, investment banking relationships may last longer than a year. Overall, our results are little affected by these modifications.

[Insert Figure 1 about here]

To have a different perspective on the impact of MAD on conflicted research, we estimate year-by-year regressions. Figure 1 plots the evolution of the affiliation bias over time. Confirming our previous results, we observe a sharp reduction in the affiliation bias after 2004, the year of the first implementation of MAD (in Germany). Indeed, the affiliation bias drops from 0.3 in 2003 to slightly more than 0.1 in 2005. After 2004, we see a permanent decrease in the affiliation bias. Notably, while confirming the effect of MAD, the observed pattern also suggests that our results are not due to the worldwide reaches of the U.S. regulations adopted shortly before MAD. Indeed, RegFD, NASD Rule 2711, NYSE Rule 472, and the Global Research Settlement were enacted less than two years before MAD. On this ground, one could argue that our estimates simply reflect the spillover effects of U.S. regulations on the European Markets (e.g., Hovakimian and Saenyasari, 2010). Yet, Figure 1 reveals

[15] As an example, assume three brokers with the following recommendations (the subscript identifies the broker): $rec_1 = 3$, $rec_2 = 4$ and $rec_3 = 5$. If they come in this order, then we measure the following optimism: $Optimism_2 = 4 - 3 = 1$ and $Optimism_3 = 5 - (4 + 3)/2 = 1.5$. However, if broker 3 releases its recommendation just before broker 2, then we obtain the following measure of optimism: $Optimism_2 = 4 - (5 + 3)/2 = 0$ and $Optimism_3 = 5 - 3 = 2$. Arguably, this concern is lessened when the consensus is obtained with a large number of recommendations.

that the large reduction in the over-optimism of affiliated brokers only materialized after 2004. In the Internet Appendix, we formally verify that our results are not driven by U.S. regulations. In particular, we estimate that affiliated brokers continue to issue over-optimistic recommendations during the interim period going from the adoption of the U.S. regulation to the implementation of MAD. Moreover, brokers who were part of the Global Settlement continued to favor European companies they advised or underwrote until MAD was enacted.

[Insert Figure 2 about here]

Alternatively, we estimate the average affiliation bias in event-time around each country-specific enactment. We create a set of event-time dummies where the event year (year 0) represents the enactment of MAD in each country. We consider a window that comprises two years before and respectively two years after MAD. To track the evolution of the affiliation bias around the passage of MAD, we re-estimate Equation (1) but replace MAD by the set of event-time dummies. Figure 2 exhibits the evolution of the affiliation. We observe a slight increase in the affiliation bias ($\gamma_0$ goes from 0.267 to 0.335) before the passage of MAD.[16] Nevertheless, we see a massive reduction in the bias after the introduction of MAD ($\gamma_0$ goes from 0.335 to 0.066). The observed event-time pattern largely confirms that MAD had a large effect on the over-optimistic recommendations of affiliated brokers.

Taken together, this set of results highlights two notable facts. First, similar to what has been document in the U.S., the European financial analysis industry was indeed plagued by over-optimism biases in the pre-MAD era. Second, the provisions of the European regulation appear to have curbed a large part of the over-optimism of affiliated broker.

In the Internet Appendix we provide additional evidence that support our interpretation as well as the validity of the identification strategy. In particular, we show that the results are robust to various econometric specifications. Also, we show that our results are not sensitive to a change in what we consider the "relevant" jurisdiction. In addition, we provide evidence that the observed over-optimism of affiliated brokers is neither the result of the process through which firms select banks for advisory

[16] This decrease can reflect a limited effect of U.S. regulations in Europe, or the effect of the early adoption of MAD by Germany or Finland in 2004.

and underwriting mandates (e.g. firms selecting brokers having the most positive views on their business), nor translating a privileged access to valuable firm-specific information (e.g., Michaely and Womack, 1999).

## 5. Legal Sanctions and Enforcement

Our results so far indicate that the adoption of MAD has significantly reduced the conflicted recommendations of affiliated brokers. Yet, we have treated all European countries as being homogenous and hence have estimated the *average* effect of MAD on brokers' over-optimism across Europe. However, due to the lack of legal harmonization in Europe, MAD is not uniformly implemented and enforced across countries. As a result, the disciplining effect associated with MAD could differ from one country to another. To have a clearer picture about the heterogeneity that may exist across European countries, we first examine whether affiliated brokers' over-optimism differs across countries. Figure 3 displays the results of country-by-country specifications. We present the estimated over-optimism bias of affiliated brokers both before (coefficient on Affiliated, represented by the light grey bars) and after MAD (sum of the coefficient on Affiliated and Affiliated×MAD, represented by the dark grey bars).

[Insert Figure 3 about here]

This figure reveals considerable variation across countries, both in the magnitude of the affiliation bias in the pre-MAD era and in the impact of MAD on this bias. For instance, before MAD, affiliated brokers issued largely over-optimistic recommendations on Austrian, British, or Swedish firms but much less when they recommended Belgian, or French firms. Also, the (percentage) reduction of this affiliation bias after MAD appears to vary considerably across countries. It ranges between 50% in Sweden to more than 165% in Belgium, where affiliated brokers became *less* optimistic than unaffiliated brokers after MAD.[17] In this section we explore whether the observed heterogeneity in the extent of conflicted research and the mitigating impact of MAD is related to

[17] We find this pattern in five countries (Belgium, Germany, Finland, Ireland, and Portugal). Yet, the affiliation bias is never significantly negative (at a 10% confidence level).

systematic differences in the severity of the legal sanctions associated with violations of MAD's rules and the strength with which each country enforces the rules.

## 5.1. LEGAL SANCTIONS

We first focus on legal sanctions. Although the rules of MAD apply to all European countries, Member States and national parliaments decide independently on the sanctions that prevail in case of violation of the rules. On this front, we observe substantial differences in administrative and penal sanctions across countries. In practice, these differences imply that analysts communicating biased advices and accused of market manipulation face very different penalties depending on the jurisdiction where they are prosecuted.

We use three variables to capture the disparity in legal sanctions associated with violations of MAD across European countries. First, we develop an index of sanction severity (Sanction Severity) related to the specific provisions of MAD. To do so, we collect information on legal sanctions from the "*Report on Administrative Measures and Sanctions Available in Member States under the Market Abuse Directive*", published by the Committee of European Regulators (CESR). Among the twenty-two articles that constitute the Market Abuse Directive, four are of particular interest when it turns to legal sanctions[18]: Article 4 that deals with secondary insiders and the disclosure of inside information, Article 6.3 that deals with disclosure of inside information to third parties, Article 6.5 that concerns the dissemination of research, and Article 14.3 that relates to the failure to cooperate with the regulator. While only Article 6.5 *explicitly* mentions stock recommendations ("*persons who produce or disseminate research […] recommending or suggesting investment strategy*") the three other articles *implicitly* concerns the transmission of information and investment advices. So, we consider them as legally relevant in our context.[19] For each article, the CESR report provides information on three distinct types of sanctions: administrative pecuniary sanctions, criminal sanctions (imprisonment), and criminal sanctions (fines and other measures). Using this source, for each country

[18] The remaining articles are targeting primary insiders or are not subject to sanctions.

[19] Note that we have also developed a similar "sanction severity index" by focusing only on the sanction related to Article 6.5. The results are unchanged.

and each of the four above mentioned articles, we gather the maximum hypothetical sanction that would prevail in case of a violation. Table IV exhibits the substantial discrepancies existing across countries. For instance, while the pecuniary administrative sanctions are non-existent in Denmark, they can represent up to 2.5 million Euros in Portugal and Ireland, and are uncapped in the U.K. Likewise a violation of the Article 4 could lead to more than ten years of imprisonment in Italy and Ireland, but engenders no criminal charges in Finland. To formally synthesize the differences in sanction severity across European countries, we create an index that is based on the ranking of each country for each type of sanction. Specifically, for hypothetical violations of articles 4, 6.3, 6.5 and 14.3 respectively, we rank the thirteen countries based on their respective administrative pecuniary penalties.

[Insert Table IV about here]

Then, for each country, we compute the average rank for pecuniary administrative sanctions. We re-iterate this procedure for both criminal sanctions and fines. Next, we sum these three rankings to obtain an aggregate index that we use to assign a rank to each country (sanctions rank). When information is not available, it is replaced by the sanction incurred for violation of the remaining articles within the same class of sanctions. With this procedure, the index of sanction severity provides a consistent hierarchy of the severity with which each country penalizes violations of MAD's provisions. Table V reveals that the U.K., Spain, and Italy appear to have strong sanctions. In contrast, the Scandinavian countries turn out to rely on mild levels of legal sanctions and, more importantly, to rely on classic courts (as opposed to regulators).

[Insert Table V about here]

Second, we follow Christensen et al. (2011) and rely on a survey realized by the CESR with the supervisory authorities of each Member State about the existence of specific supervisory power regarding the translation of MAD into local law (see CESR 07-693). We simply count the number of positive answers (out of 86 possible) to construct the variable Supervisory Power. A higher value of this index indicates a large power of local authorities to convert MAD's rules into local penalties. Finally, we use the index of criminal sanctions (Sanctions LLS) developed by La Porta et al. (2006). It is based on the criminal sanctions against directors, distributors, and accountants in each country. A

higher index indicates more severe criminal sanctions. While not directly linked to the sanctions prevailing for violations of MAD's rules, this index is designed to capture the general attitude of a country vis-à-vis the severity of its criminal charges.

Using these three sanction-related measures, we assess whether the strictness of legal sanctions affect the change in brokers' behavior around the adoption of MAD. Specifically, we estimate our baseline (difference-in-differences) Equation (1) separately across two groups of countries based on their associated sanctions. We assign a country in the "Weak" ("Strong") group if its index of Supervisory Power, Sanction Severity or Sanctions LLS is below the sample median. By estimating such a *triple*-differences model, we gauge whether the degree of legal sanctions affects the over-optimism of affiliated brokers, and whether the effect of MAD on brokers' behavior varies with the associated legal sanctions. To compare coefficients across the two groups, we estimate a Seemingly Unrelated Regression (SUR) system that combines the "Weak" and "Strong" groups. The SUR estimation provides the joint variance-covariance matrix that we use to compare cross-equation coefficients.

[Insert Table VI about here]

Table VI reports the results across the "Weak" and "Strong" countries. With all three proxies for legal sanctions, we observe no difference in the over-optimism bias of affiliated brokers between country groups in the pre-MAD period. *F*-tests reveal that the coefficients on Affiliated are not statistically different between the "Weak" and "Strong" partitions. Furthermore, we find that the adoption of MAD reduces the over-optimism bias of affiliated brokers both in "Weak" and "Strong" countries. However, the magnitude of this reduction differs across partitions. Notably, the disciplining impact of MAD appears much larger in countries that accompany the passage of MAD with strong legal sanctions. Our estimations indicate that the coefficients on Affiliated×MAD range between -0.157 and -0.170 in "Weak" countries. In contrast, they are comprised between to -0.248 and -0.275 in "Strong" countries. In terms of economic magnitude, the observed differences are non-negligible. Across all measures of sanction severity, our estimates suggest that MAD essentially eliminates the over-optimism bias of affiliated brokers in countries equipped with strong legal sanctions. In countries where legal sanctions are weaker, the adoption of MAD triggers a reduction of

the affiliation bias of ranging between 65% and 73%.[20] Overall, the results in Table VI support the idea that the behavior of affiliated brokers is significantly affected by the severity of the potential sanctions they face. In the context of MAD, the specific legal sanctions established by Member States appear to play a role in explaining the behavior of conflicted brokers around the adoption of the European Directive.

### 5.2. ENFORCEMENT

Besides differences in legal sanctions, the enforcement of MAD's provisions also varies across countries (e.g. Enriques and Gatti, 2008). Indeed, while the rules of MAD prevail in all EC countries, their enforcement is left to national authorities. Recent research in law and finance suggests that the intensity of enforcement effort by securities regulators is of paramount importance to understand the effectiveness of regulatory changes. In particular, La Porta et al. (2006), Coffee (2007), or Jackson and Roe (2009) highlight that strong enforcement of legal rules propels financial market development. Also, Bushman et al. (2005) and Hope (2003) show that enforcement intensity generally improve the production of financial analysts. On this ground, we examine whether the strength of enforcement at the country level also affects the impact of MAD on the behavior of affiliated brokers.

While the idea that enforcement plays an important role in shaping regulations' success, measuring enforcement intensity is a difficult task. Researchers have taken different roads to capture level of enforcement of securities regulations.[21] Because *public* enforcement is the main (if not the only) source of enforcement in Europe, we solely focus on measures of public enforcement. Specifically, we rely on three different measures. First, we follow Jackson and Roe (2009) and use two resource-based measures to capture the country level of public enforcement intensity. The first variable measures the

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[20] In unreported tests, we directly use the (continuous) sanction variables instead of the country partitions to examine the effect of legal sanctions. Reassuringly, we reach the same conclusion. The reduction of the over-optimism of affiliated brokers following MAD increases with our measures of legal sanctions.

[21] There are two main approaches to measure the intensity of enforcement: a) the resources available to regulatory agencies (input) and b) the number of actions brought, the aggregate financial sanctions levied and the aggregate number of years sentenced (output). None of them is exempt of criticism. The former can overstate the intensity of enforcement because of inefficient use of resources. The latter is a biased proxy since strict enforcement and no enforcement at all lead to no observable violations of the law; for a detailed analysis, see Coffee (2007).

size of the regulatory staff that oversees capital markets, scaled by country population (Staff). The second variable measures the securities regulatory budget scaled by the nation's gross domestic product (Budget). Both variables are constructed from the 2006 and 2007 editions of "*How Countries Supervise Their Banks, Insurers and Securities Markets*". These two variables proxy for the level of resources that a nation allocates to enforce its legal rules, scaled by either the nation's economic size or its population.[22] As suggested by Jackson and Roe (2009), higher budgets and greater staffing allow the regulator to examine allegations of wrongdoing, to write its rules carefully, to conduct market surveillance, and to act more often to prevent, remedy and punish wrongdoing. Alternatively, we use the index of public enforcement developed by La Porta et al. (2006). This index (Enforcement LLS) measures the intensity of public enforcement via the supervisor's formal quality. It aggregates information on the independence of the supervisors from the executive power, the supervisors' investigative power, and their capacity to issue remedial orders. A higher value for this index indicates stronger enforcement. The second part of Table V summarizes the three measures of public enforcement by Member States.

Then, to gauge how the intensity of public enforcement is related to the impact of MAD, we split countries into "Weak" and "Strong" enforcement based on the median value of each enforcement measure (Staff, Budget and Enforcement LLS) use again a triple-differences approach. Importantly, because the provisions of MAD are held constant across countries, our triple-difference estimation enables us to cleanly isolate the effect of public enforcement on brokers' behavior from other effects coming from cross-country differences in regulatory provisions. The results reported in Table VII reveal several interesting findings. First, we note that the coefficient on Affiliated appears slightly larger in countries characterized by low enforcement intensity. Yet the difference is not significant at conventional levels (*p*-values of 0.31 and 0.14 for the Staff and Budget measures) affiliated brokers appear to be more over-optimistic in these countries during the pre-MAD era. Second, across the three measures of public enforcement, the effect of MAD on affiliated brokers' optimism is markedly larger in countries characterized by strong enforcement power. Similarly to the effect of legal sanctions, we

[22] To the best of our knowledge, no broker was sued because of violation of MAD provisions over our sample period. Therefore, we do not rely on enforcement outputs.

observe that the over-optimism bias virtually vanishes after MAD in countries that enforce laws vigorously. On the contrary, while significant, MAD only triggers a partial reduction of the affiliation bias in countries where public enforcement is weaker. In line with Coffee (2007) and Jackson and Roe (2009), our results confirm that public enforcement matters. In our context, it matters by limiting conflicted equity research subsequently to the adoption of MAD.

[Insert Table VII about here]

All in all, our analysis indicates that the strength with which countries enforce their laws and, to a lesser extent, the severity of the legal sanctions play a key role in understanding how affiliated brokers reacted to MAD. While Hope (2003) and Bushman et al. (2005) underscore that the vigor of legal enforcement affects analysts' coverage intensity and accuracy, we show that strong sanctions and enforcement impact the behavior of conflicted brokers. A key distinction with the above papers is that we focus on a *single* law that is common to all European countries. Interestingly, even though our results are limited to a specific law that applies to thirteen European countries, they suggest that, without an effort to harmonize the legal sanctions and enforcement procedures across countries, the effectiveness of European regulations may well be country dependent. On this front, our results confirm the conclusions of Christensen et al. (2011), who document that country-level enforcement is a key element that explains the positive effect of MAD and the recent European Transparency Directive on the liquidity of European stocks.

## 6. Conclusion

We use the recent implementation of the Market Abuse Directive (MAD) in Europe to examine the interplay between securities regulation and the behavior of conflicted brokers. Our analysis highlights several notable results. First, we establish the presence of conflicted equity research in Europe during the pre-MAD era: Brokers issued significantly more favorable recommendations on firms with which they entertained investment banking relationship. Second, we find that the passage of MAD significantly reduced this practice. Third, using the heterogeneity that exists in legal sanctions and enforcement practices across European countries, we find that the curbing effect of MAD largely depends on countries' institutional traits. The impact of MAD is significantly

stronger in countries where the sanctions applicable in cases of violations of MAD's rules are severe. Also, our results highlight that the reduction of conflicts of interest is more pronounced in countries that strictly enforce their laws.

In a nutshell, the main message of this paper is that legal sanctions and enforcement mechanisms are important elements affecting the extent of conflicts of interest that arise when brokers issue recommendations on their investment banking clients. Our findings point to interesting avenues for further research, two of which we outline here. First, we uncover that the behavior of financial analysts appears somewhat different in Europe compared to what has been documented in the U.S. For instance, we show that the distribution of stock recommendations is much more balanced in Europe. It would be interesting to examine what could drive such differences, and study what are the implications for the organization and development of this industry.

Second, the provisions of MAD encompass a broad spectrum of actors, including firms and their executives, financial institutions, investors, stock exchanges, auditors, and regulators. While this paper focuses on brokers, it would be interesting to examine how the regulatory changes that recently occurred in Europe affect each of these actors, and more generally how they modify the functioning of European financial markets. There is some valuable early evidence on some of these issues. For instance, Christensen et al. (2011) report that the implementation of MAD and the adoption of the Transparency Directive in 2007 (TD) triggered a significant increase in liquidity across European markets. Given the richness of the European setting and the heterogeneity that exists between Member States, we hope to see more research on these and related questions.

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## Appendix: Definition of and source of the variables

| Variable | Definition | Source |
|---|---|---|
| Optimism | The difference between the recommendation issued by broker *b* on firm *i* of country *c* at time *t* and the consensus (mean of the last recommendations issued by brokers following firm *i* during the year preceding *t*) | IBES |
| Affiliated | Dummy variable that equals 1 if broker *b* had investment banking business with firm *i* during the year preceding *t*, and zero otherwise | SDC and IBES |
| MAD | Dummy variable that equals 1 if the recommendation is released after MAD was enacted in country *c* (or after December 23th, 2003 when explicitly specified) | EC[23] |
| Herding | Dummy variable that equals 1if the current recommendation is issued less than ten days after a recommendation on the same stock and both are either favorable or unfavorable. | IBES |
| CER | Dummy variable that equals 1 if earnings are released during the two-day period before the recommendation and 0 otherwise | IBES |
| Prior Firm return | Firm *i* stock returns during the year preceding *t* | Datasteam |
| Prior Market return | Stock market returns of country *c* during the year preceding *t* | Datastream |
| log(#Analysts) | The logarithm of the number of analysts following firm *i* during the year preceding *t* | IBES |
| log(#Firms covered) | The logarithm of the number of firms followed by broker *b* during the year preceding *t* | IBES |
| Initiation | Dummy variable that equals 1 if broker *b* did not issue recommendations on stock *i* before *t*. | IBES |
| Sanction severity | The thirteen countries are ranked based on their respective administrative pecuniary penalties, criminal sanctions and fines (articles 4, 6.3, 6.5 and 14.3). For each country, the average rank for the three sorts of sanctions is the sanction severity index. | CESR and own computation |
| Supervisory power | Number of positive answers (for each EC Member State) to a questionnaire on the existence of specific supervisory powers regarding the translation of MAD into local law | CESR 07-693 |
| Sanctions LLS | Index of criminal sanctions | La Porta et al. (2006, p.9) |
| Staff | Size of the regulatory staff that oversees capital markets, scaled by country population | Jackson and Roe (2009) |
| Budget | Securities regulatory budget scaled by the nation's gross domestic product | Jackson and Roe (2009) |
| Enforcement LLS | Index of public enforcement | La Porta et al. (2006, p. 9) |

[23] See http:// ec.europa.eu /internal_market/finances/actionplan/transposition/index_en.htm

| | | |
|---|---|---|
| Country | Austria (AUT), Belgium (BEL), Denmark (DNK), Finland (FIN), France (FRA), Germany (DEU), Ireland (IRE), Italy (ITA), Netherland (NLD), Portugal (PRT), Spain (ESP), Sweden (SWE) and the United Kingdom (GBR) | Thomson Reuters (ISO country code) |

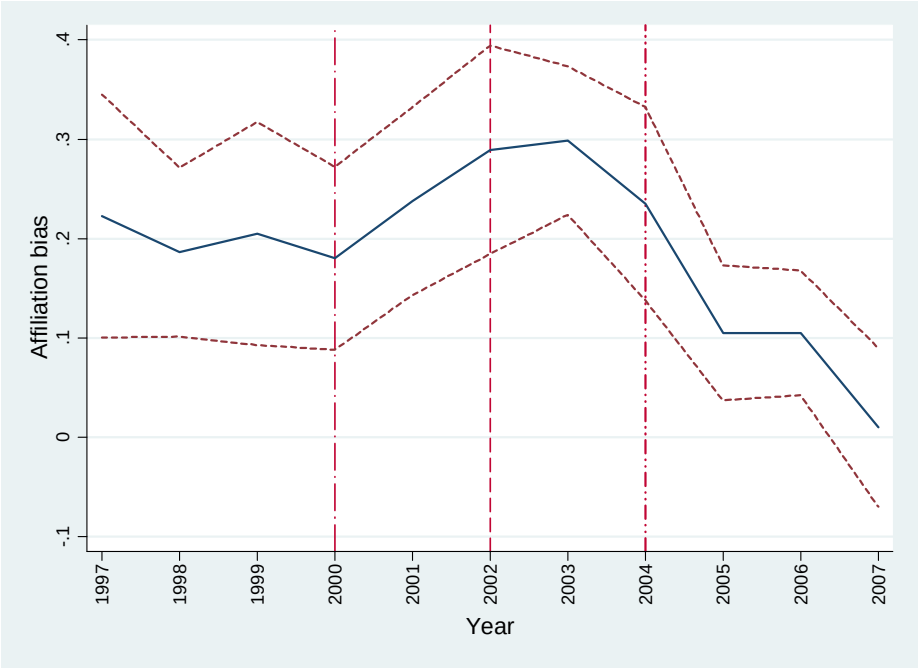


*Figure 1*. The affiliation bias over time. This figure reports the affiliation bias over time and its 95 confidence bounds. The affiliation bias is obtained from year-by-year regressions of the effect of brokers' affiliation (Affiliated) on their relative recommendations (Optimism). All the specifications include the set of control variables defined in section 3.3 as well as brokers and country fixed effects. The sample period ranges from 1997 to 2007. The vertical lines indicate the enactment of the U.S. regulation RegFD (SOX) in 2000 (2002) and the first implementation of MAD in Germany in 2004.

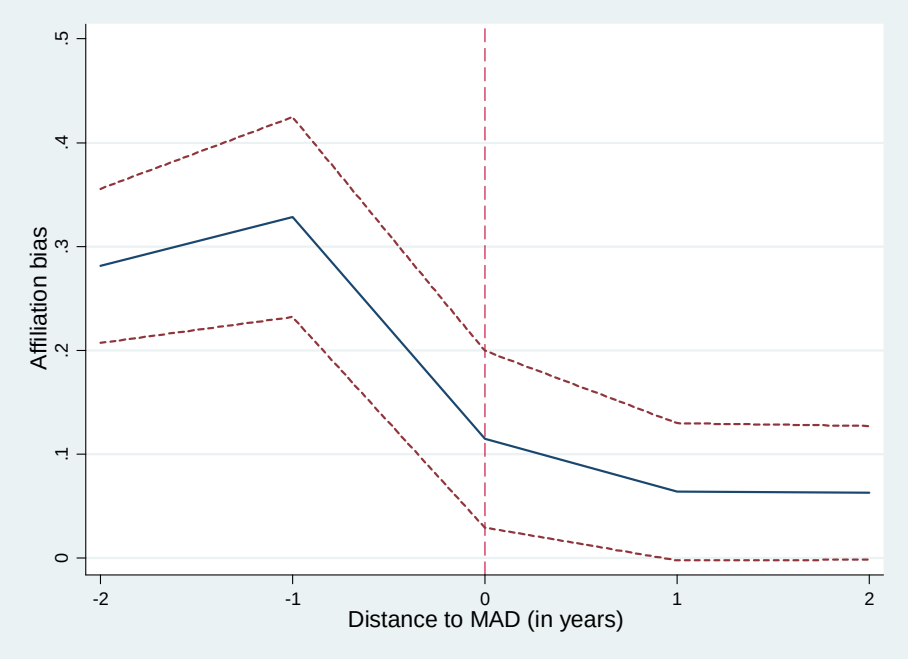


*Figure 2*. The affiliation bias around the enactment of MAD. This figure reports the affiliation bias in event time and its 95 confidence bounds. The results are from an event-time analysis of the effect of brokers' affiliation (Affiliated) on their relative recommendations (Optimism). Specifically, we create a set of event-time dummies where the event year (year 0) represents the enactment of MAD in each country. We consider a window that comprises two years before and respectively after MAD. Then, we track the evolution of the affiliation bias around the passage of MAD. All the specifications include the set of control variables defined in section 3.3 as well as brokers, year, and country fixed effects. The sample period is from 1997 to 2007.

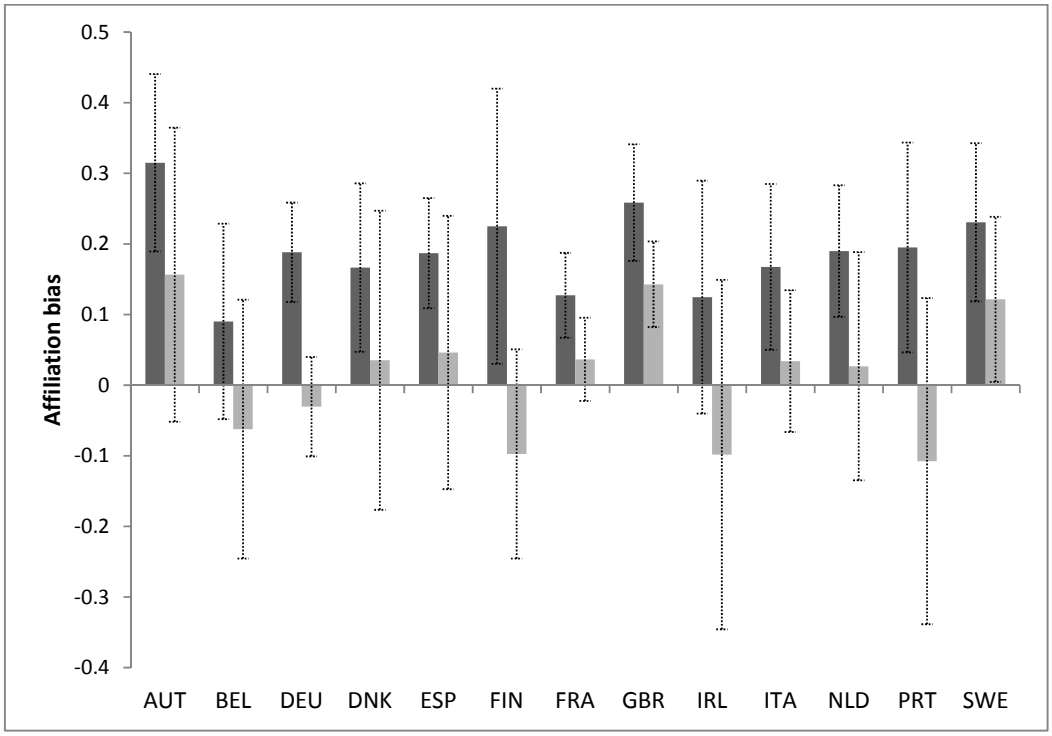


*Figure 3*. The affiliation bias across countries. This figure reports the affiliation bias before (dark gray bars) and after (light grey bars) the adoption of MAD for each country as well as the 95% confidence bounds. The estimated affiliation biases are obtained from country-by-country estimations of Equation (1). All the specifications include the set of control variables defined in section 3.3 as well as broker and year fixed effects. The sample period is from 1997 to 2007.

*Table I*. Descriptive statistics

This table reports the total number and the proportion of stock recommendations issued by brokers on European firms over the 1997-2007 period. Stock recommendations are classified into five categories (Strong Sell, Sell, Neutral, Buy, Strong Buy). We report the proportion () of recommendations for each category. Panel A displays the distribution of recommendations sorted by year. Panel B presents the distribution of recommendations sorted by countries, together with the exact date at which MAD was passed into national laws.

| Panel A: By year | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Year | #Reco. | Strong Sell (%) | Sell (%) | Neutral (%) | Buy (%) | Strong Buy (%) | #Firms | #Brokers |
| 1997-2007 | 261,260 | 5.33 | 12.74 | 35.20 | 28.49 | 18.23 | 3,412 | 224 |
| 1997 | 23,224 | 7.72 | 8.16 | 38.70 | 21.95 | 23.46 | 2,107 | 130 |
| 1998 | 24,654 | 6.55 | 10.92 | 36.83 | 26.17 | 19.52 | 2,119 | 137 |
| 1999 | 24,293 | 4.73 | 9.53 | 34.50 | 30.90 | 20.34 | 2,218 | 135 |
| 2000 | 21,008 | 3.63 | 8.98 | 32.88 | 33.69 | 20.82 | 1,981 | 118 |
| 2001 | 24,245 | 5.18 | 13.09 | 36.59 | 28.40 | 16.73 | 2,110 | 113 |
| 2002 | 23,874 | 4.69 | 16.14 | 32.43 | 31.48 | 15.26 | 1,910 | 108 |
| 2003 | 24,250 | 5.67 | 17.94 | 35.29 | 29.25 | 11.86 | 1,493 | 102 |
| 2004 | 22,116 | 5.24 | 14.27 | 34.44 | 30.09 | 15.95 | 1,773 | 129 |
| 2005 | 23,772 | 4.72 | 14.93 | 37.18 | 27.17 | 16.00 | 2,025 | 145 |
| 2006 | 24,336 | 5.02 | 13.80 | 34.27 | 27.78 | 19.13 | 2,127 | 146 |
| 2007 | 25,488 | 5.31 | 12.02 | 33.89 | 27.19 | 21.59 | 2,153 | 147 |

Panel B: By country

| Country | MAD | #Reco. | Strong Sell (%) | Sell (%) | Neutral (%) | Buy (%) | Strong Buy (%) | #Firms | #Brokers |
|---|---|---|---|---|---|---|---|---|---|
| AUT | 01.01.2005 | 2,765 | 3.22 | 9.44 | 40.80 | 26.18 | 20.36 | 82 | 54 |
| BEL | 19.09.2005 | 7,446 | 3.92 | 12.36 | 38.50 | 27.06 | 18.16 | 111 | 85 |
| DEU | 30.10.2004 | 40,175 | 6.35 | 12.36 | 39.54 | 24.32 | 17.43 | 443 | 119 |
| DNK | 01.04.2005 | 7,493 | 6.89 | 17.44 | 29.32 | 30.07 | 16.28 | 114 | 82 |
| ESP | 24.11.2005 | 15,171 | 7.00 | 15.26 | 31.07 | 27.52 | 19.15 | 128 | 92 |
| FIN | 01.07.2005 | 10,367 | 5.08 | 20.23 | 27.03 | 34.34 | 13.32 | 107 | 90 |
| FRA | 21.07.2005 | 43,097 | 4.52 | 15.06 | 30.04 | 30.76 | 19.62 | 518 | 129 |
| GBR | 01.07.2005 | 76,633 | 5.00 | 9.70 | 36.96 | 29.14 | 19.19 | 1,253 | 116 |
| IRL | 06.07.2005 | 1,861 | 1.56 | 5.86 | 31.27 | 36.65 | 24.66 | 37 | 41 |
| ITA | 18.05.2005 | 15,495 | 3.26 | 11.65 | 40.87 | 29.20 | 15.02 | 214 | 103 |
| NLD | 01.10.2005 | 21,238 | 6.54 | 11.06 | 38.38 | 24.58 | 19.44 | 159 | 120 |
| PRT | 30.03.2006 | 4,039 | 6.81 | 14.14 | 32.71 | 28.42 | 17.93 | 58 | 56 |
| SWE | 01.07.2005 | 15,480 | 5.90 | 17.26 | 30.44 | 30.79 | 15.60 | 188 | 95 |

*Table II*. Recommendations released by affiliated and non affiliated brokers before MAD

This table reports the proportion of stock recommendations issued by brokers on European firms over the 1997-2007 period, sorted by affiliation. A stock recommendation is classified as Affiliated ("Aff.") if it is issued by a broker on a firm for which it has acted as an underwriter or adviser over the previous year. Stock recommendations are classified into five categories (Strong Sell, Sell, Neutral, Buy, Strong Buy). We report the proportion (%) of recommendations for each category. Panel A displays the distribution of stock recommendations sorted by year, the difference across Affiliated and Non-Affiliated recommendations and the associated *p*-values. Panel B presents the distribution of recommendations sorted by countries.

| Panel A: By year | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | | Strong Sell (%) | | | Sell (%) | | | Neutral (%) | | | Buy (%) | | | Strong Buy (%) | | |
| | Aff. (%) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) |
| Before MAD (a) | 2.08 | 1.19 | 5.50 | 0.00 | 6.08 | 12.76 | 0.00 | 31.74 | 35.29 | 0.00 | 38.16 | 28.71 | 0.00 | 22.83 | 17.73 | 0.00 |
| After MAD (b) | 2.59 | 2.34 | 5.14 | 0.00 | 8.18 | 13.25 | 0.00 | 38.40 | 35.05 | 0.01 | 33.66 | 27.00 | 0.00 | 17.42 | 19.55 | 0.03 |
| *p*-val. (a)-(b) | 0.00 | 0.01 | 0.00 | | 0.01 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | | 0.00 | 0.00 | |
| 1997 | 1.29 | 2.33 | 7.80 | 0.00 | 4.67 | 8.21 | 0.00 | 36.00 | 38.74 | 0.33 | 29.00 | 21.86 | 0.01 | 28.00 | 23.40 | 0.08 |
| 1998 | 1.57 | 0.26 | 6.66 | 0.00 | 4.38 | 11.03 | 0.00 | 30.15 | 36.94 | 0.00 | 38.40 | 25.97 | 0.00 | 26.80 | 19.41 | 0.00 |
| 1999 | 2.03 | 1.42 | 4.80 | 0.00 | 2.64 | 9.67 | 0.00 | 27.38 | 34.65 | 0.00 | 38.95 | 30.74 | 0.00 | 29.61 | 20.15 | 0.00 |
| 2000 | 2.55 | 0.75 | 3.71 | 0.00 | 2.80 | 9.14 | 0.00 | 25.37 | 33.08 | 0.00 | 41.42 | 33.48 | 0.00 | 29.66 | 20.58 | 0.00 |
| 2001 | 2.89 | 1.28 | 5.30 | 0.00 | 7.42 | 13.26 | 0.00 | 31.67 | 36.74 | 0.00 | 33.81 | 28.24 | 0.00 | 25.82 | 16.46 | 0.00 |
| 2002 | 2.07 | 0.61 | 4.77 | 0.00 | 7.91 | 16.32 | 0.00 | 30.43 | 32.48 | 0.33 | 39.55 | 31.31 | 0.00 | 21.50 | 15.12 | 0.00 |
| 2003 | 1.98 | 0.83 | 5.76 | 0.00 | 10.83 | 18.08 | 0.00 | 38.13 | 35.23 | 0.20 | 41.25 | 29.00 | 0.00 | 8.96 | 11.92 | 0.02 |
| 2004 | 2.30 | 1.38 | 5.33 | 0.00 | 6.68 | 14.45 | 0.00 | 33.60 | 34.46 | 0.68 | 40.67 | 29.84 | 0.00 | 17.68 | 15.91 | 0.30 |
| 2005 | 2.56 | 2.46 | 4.78 | 0.00 | 9.52 | 15.07 | 0.00 | 37.93 | 37.16 | 0.70 | 34.15 | 26.99 | 0.00 | 15.93 | 16.00 | 0.96 |
| 2006 | 2.51 | 1.31 | 5.12 | 0.00 | 7.38 | 13.97 | 0.00 | 35.57 | 34.23 | 0.49 | 36.39 | 27.56 | 0.00 | 19.34 | 19.12 | 0.89 |
| 2007 | 2.48 | 3.48 | 5.36 | 0.01 | 7.11 | 12.14 | 0.00 | 41.71 | 33.70 | 0.00 | 32.39 | 27.06 | 0.00 | 15.32 | 21.75 | 0.00 |
| 1997-2007 | 2.20 | 1.51 | 5.42 | 0.00 | 6.68 | 12.88 | 0.00 | 33.62 | 35.24 | 0.01 | 36.89 | 28.30 | 0.00 | 21.30 | 18.17 | 0.00 |

| Panel A: By year | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Aff. (%) | Strong Sell (%) | | | Sell (%) | | | Neutral (%) | | | Buy (%) | | | Strong Buy (%) | | |
| | | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) | Aff. (i) | N-Aff. (ii) | *p*-val. (i)-(ii) |
| Austria | 4.92 | 0.00 | 3.39 | 0.00 | 0.74 | 9.89 | 0.00 | 44.12 | 40.62 | 0.42 | 27.94 | 26.09 | 0.64 | 27.21 | 20.01 | 0.06 |
| Belgium | 2.31 | 0.00 | 4.01 | 0.00 | 11.05 | 12.39 | 0.58 | 37.21 | 38.53 | 0.72 | 34.88 | 26.88 | 0.03 | 16.86 | 18.19 | 0.65 |
| Germany | 2.28 | 2.19 | 6.45 | 0.00 | 6.56 | 12.49 | 0.00 | 36.72 | 39.61 | 0.07 | 33.88 | 24.10 | 0.00 | 20.66 | 17.35 | 0.01 |
| Denmark | 1.67 | 2.40 | 6.96 | 0.00 | 9.60 | 17.58 | 0.00 | 28.80 | 29.33 | 0.90 | 43.20 | 29.85 | 0.00 | 16.00 | 16.29 | 0.93 |
| Spain | 2.50 | 3.16 | 7.10 | 0.00 | 6.32 | 15.49 | 0.00 | 31.32 | 31.06 | 0.91 | 32.11 | 27.40 | 0.05 | 27.11 | 18.95 | 0.00 |
| Finland | 1.53 | 1.26 | 5.14 | 0.00 | 11.95 | 20.36 | 0.00 | 37.74 | 26.86 | 0.00 | 28.93 | 34.42 | 0.13 | 20.13 | 13.22 | 0.03 |
| France | 3.04 | 0.92 | 4.63 | 0.00 | 7.33 | 15.30 | 0.00 | 32.24 | 29.97 | 0.08 | 42.25 | 30.40 | 0.00 | 17.27 | 19.70 | 0.02 |
| U.K. | 1.66 | 0.94 | 5.07 | 0.00 | 4.09 | 9.80 | 0.00 | 31.18 | 37.06 | 0.00 | 37.72 | 29.00 | 0.00 | 26.06 | 19.07 | 0.00 |
| Ireland | 2.10 | 0.00 | 1.59 | 0.00 | 5.13 | 5.87 | 0.84 | 30.77 | 31.28 | 0.95 | 33.33 | 36.72 | 0.66 | 30.77 | 24.53 | 0.40 |
| Italy | 2.39 | 1.89 | 3.29 | 0.05 | 7.01 | 11.76 | 0.00 | 40.43 | 40.88 | 0.86 | 37.20 | 29.01 | 0.00 | 13.48 | 15.06 | 0.38 |
| Netherlands | 2.17 | 2.60 | 6.62 | 0.00 | 5.42 | 11.19 | 0.00 | 34.49 | 38.47 | 0.08 | 30.80 | 24.45 | 0.00 | 26.68 | 19.28 | 0.00 |
| Portugal | 3.64 | 2.04 | 6.99 | 0.00 | 7.48 | 14.39 | 0.00 | 34.69 | 32.63 | 0.61 | 36.73 | 28.11 | 0.03 | 19.05 | 17.88 | 0.72 |
| Sweden | 1.73 | 1.49 | 5.98 | 0.00 | 13.81 | 17.32 | 0.10 | 25.75 | 30.52 | 0.08 | 42.16 | 30.59 | 0.00 | 16.79 | 15.58 | 0.60 |

*Table III*. The impact of MAD on brokers' over-optimism

This table presents results of regressions examining the impact of MAD on brokers' over-optimism (Equation (1)). The unit of analysis is a stock recommendation. The dependent variable, Optimism, is a metric that assesses the optimism of broker *b*, at time *t*, compared to peer brokers who issued a recommendation on the same stock during the same period. MAD is a dummy variable that equals 1 after the transposition of MAD into national laws and 0 before. In column (1) we estimate our baseline specification corresponding to Equation (1). In column (2), we modify the measure of optimism by computing the consensus using recommendations from peers' brokers over the six months that precede the recommendation (instead of one year). In column (3), we modify the measure of optimism by requiring at least ten outstanding recommendations to compute a consensus. In column (4) we extend our definition of affiliation by considering as affiliated those recommendations issued by a broker that had investment banking business with the recommended firm over the three years that precede the recommendation (instead of one year). All estimations include broker fixed effects, country fixed effects, and year fixed effects. All the variables are defined in the Appendix. The sample period is 1997 to 2007. The estimations correct for heteroskedasticity and within-broker error clustering. We report *t* statistics in brackets. ** and * denote statistical significance at the 1 and 5 level, respectively. The last row presents the *p*-value of a test corresponding to: $\gamma_0$ (coefficient on Affiliated) + $\gamma_2$ (coefficient on Affiliated×MAD) = 0.

| Dependent variable: | Brokers' Optimism | | | |
|---|---|---|---|---|
| | Baseline | Optimism (6 months) | Consensus (min. 10 rec.) | Affiliated (past 3 years) |
| | (1) | (2) | (3) | (4) |
| Affiliated (i) | 0.243** | 0.204** | 0.212** | 0.176** |
| | [11.02] | [9.79] | [8.15] | [10.51] |
| MAD | 0.019 | -0.018 | -0.036 | 0.02 |
| | [0.83] | [0.98] | [1.51] | [0.90] |
| Affiliated×MAD (ii) | -0.213** | -0.165** | -0.172** | -0.126** |
| | [6.74] | [5.99] | [5.17] | [4.70] |
| Herding | -0.028** | -0.011* | -0.014* | -0.028** |
| | [5.06] | [2.35] | [2.36] | [4.98] |
| CER | 0.009 | -0.009 | -0.007 | 0.009 |
| | [0.50] | [0.61] | [0.35] | [0.52] |
| Prior Firm return | 0.004 | -0.016** | -0.02 | 0.005 |
| | [0.62] | [3.02] | [1.95] | [0.73] |
| Prior Market return | 0.017 | 0.073** | 0.122** | 0.017 |
| | [0.60] | [3.09] | [4.18] | [0.63] |
| log(#Analysts) | 0.092** | 0.032 | 0.058 | 0.091** |
| | [3.99] | [1.55] | [1.46] | [3.95] |
| log(# Firms covered) | -0.036** | -0.037** | -0.050** | -0.036** |
| | [3.58] | [4.41] | [4.84] | [3.57] |
| Initiation | 0.087** | 0.036** | 0.013 | 0.090** |
| | [7.20] | [4.05] | [1.11] | [7.43] |
| #Observations | 261,260 | 261,260 | 156,429 | 261,260 |
| $R^2$ | 0.04 | 0.03 | 0.03 | 0.04 |
| *p*-val. (i) + (ii) = 0 | 0.28 | 0.09 | 0.14 | 0.04 |

*Table IV*. Legal sanctions prevailing in case of violations of MAD's rules

This table presents the details of the legal sanctions that prevail in case of violations of MAD's rules in each Member states. As explained in Section 5.1 sanctions are collected from the "*Report on Administrative Measures and Sanctions Available in Member States under the Market Abuse Directive*" published by the Committee of European Regulators (CESR). We focus on four articles of MAD dealing with sanctions: Articles 4 (Secondary insider and disclosure of information), 6.3 (Disclosure of inside information to third party), 6.4 (Dissemination of research), and 14.3 (Failure to cooperate with the regulator). For each article, the CESR provides information on three types of sanctions: (1) Administrative pecuniary sanctions (fixed amount or in faction of brokers' profits); (2) Criminal sanctions (years of imprisonment); (3) Criminal sanctions (fines and other measures). We use these sanctions to construct an index of sanction severity related to MAD's provisions.

| | Sanction Severity | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pecuniary Administrative sanction (th. EUR) | | | | Criminal - Imprisonment (years) | | | | Criminal - Fines (th. EUR) | | | |
| Articles: | 4 | 6.3 | 6.5 | 14.3 | 4 | 6.3 | 6.5 | 14.3 | 4 | 6.3 | 6.5 | 14.3 |
| AUT | 0 | 30 | 30 | 30 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BEL | 3×Profits | 3×Profits | 3×Profits | 3×Profits | 1 | 0 | 0 | 0 | 3×Profits | 0 | 0 | 0 |
| DNK | 0 | 0 | 0 | 0 | 1.5 | 0 | 0 | 0 | 0 | NA | NA | 0 |
| FIN | 200 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FRA | 10×Profits | 1,500 | 1,500 | 0 | 1 | 0 | 0 | 2 | 10×Profits | 0 | 0 | 300 |
| DEU | 0 | 1,000 | 200 | 50 | 5 | 0 | 0 | 0 | Profits | 0 | 0 | 0 |
| IRL | 2,500 | 2,500 | 2,500 | 0 | 10 | 1 | 1 | 1 | 10,000 | 5 | 5 | 5 |
| ITA | 10×Profits | 500 | 500 | 1,000 | 12 | 0 | 0 | 8 | 10×Profits | 0 | 0 | 0 |
| NLD | 96 | 96 | 24 | 6 | 2 | 2 | 2 | 2 | Profits | Profits | Profits | Profits |
| PRT | 2,500 | 2,500 | 1,250 | 1,250 | 3 | 0 | 0 | 0 | NA | 0 | 0 | 0 |
| ESP | 5×Profits | Profits | 5×Profits | 5×Profits | 6 | 0 | 0 | 0 | 3×Profits | 0 | 0 | 0 |
| SWE | 0 | 0 | NA | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| GBR | No limit | No limit | No limit | No limit | 7 | 0 | 0 | 2 | No limit | 0 | 0 | 8 |

*Table V*. Proxies for Legal Sanctions and Public Enforcement

This table presents proxies for the legal sanctions associated with MAD and the strength with which each Member state enforces MAD's rules. We use three variables as proxies for legal sanctions. The first ("Sanction Severity") is an index of sanction severity defined in Section 5.1 based on the administrative and criminal sanctions that prevail in the context of MAD (based on information provided by the Committee of European Regulators (CESR). The second ("Supervisory Power") is based on a survey by the CESR about the existence of specific supervisory power regarding the translation of MAD into national laws. The index simple counts the number of positive answers (out of 86 possible). The third ("Sanction LLS") is the index of public enforcement developed by La Porta et al. (2006). It is based on the potential criminal sanctions against directors, distributors, and accountants in each country. We use three variables to capture the strength of public enforcement. The first enforcement-related variable ("Staff per mio. Population") measures the size of the regulatory staff that oversees capital markets scaled by each country's population. The second variable ("*Budget in $bn. GDP*") measures the securities regulatory budget scaled by country's GDP. Both variables are obtained from Jackson and Roe (2009) and are constructed from the 2006 and 2007 editions of "*How Countries Supervise Their Banks, Insurers, and Securities Markets*". The third enforcement-related variables is the public enforcement index ("Enforcement LLS") developed by La Porta et al. (2006). This index aggregates information from executive power, supervisors' investigative power, and their capacity to issued remedial orders.

| | Legal Sanctions | | | Enforcement | | |
|---|---|---|---|---|---|---|
| | Sanction Severity (1) | Supervisory Power (2) | Sanction LLS (2006) (3) | Staff per mio. Population (4) | Budget per bn. $GDP (5) | Enforcement LLS (2006) (6) |
| AUT | 10 | 70 | 0.50 | 9.97 | 34,464 | 0.90 |
| BEL | 4 | 69 | 0.50 | 13.76 | 27,276 | 0.15 |
| DNK | 12 | 60 | 0.50 | 10.85 | 25,940 | 0.37 |
| FIN | 12 | 63 | 0.00 | 11.23 | 45,937 | 0.32 |
| FRA | 4 | 75 | 0.50 | 5.91 | 28,851 | 0.77 |
| DEU | 9 | 64 | 0.50 | 4.43 | 12,903 | 0.22 |
| IRL | 4 | 73 | 0.33 | 23.32 | 72,639 | 0.37 |
| ITA | 2 | 70 | 0.42 | 7.25 | 61,239 | 0.48 |
| NLD | 7 | 67 | 0.83 | 23.53 | 131,285 | 0.47 |
| PRT | 7 | 73 | 0.50 | 14.5 | 75,562 | 0.58 |
| ESP | 2 | 60 | 0.50 | 8.5 | 29,873 | 0.33 |
| SWE | 11 | 73 | 0.00 | 7.19 | 21,988 | 0.50 |
| GBR | 1 | 76 | 0.58 | 19.04 | 80,902 | 0.68 |

*Table VI*. The impact of MAD on brokers' over-optimism – Legal Sanctions

This table presents results of regressions examining whether the impact of MAD on brokers' over-optimism (Equation (1)) depends on legal sanctions. The unit of analysis is a stock recommendation. The dependent variable, *Optimism*, is a metric that assesses the optimism of broker b, at time t, compared to peer brokers who issued a recommendation on stock i. Affiliated is a dummy variable that equals 1 if the issuing broker had investment banking business with the recommended firm during the preceding year. MAD is a dummy variable that equals 1 after the transposition of MAD into national laws and 0 before. We partition countries based on three proxies for the severity of legal sanctions. In columns (1) and (2), we partition the sample based on the index of sanction severity defined in Section 5.1. In columns (3) and (4), we partition the sample based on the index of supervisory power as defined in the 2007 report of the CESR. In columns (5) and (6), we partition the sample based on the index of criminal sanction developed by La Porta et al. (2006). For each variable, we assign a country into the "Weak" group if it has value below the sample median and in the "Strong" group if it has value above the sample median. We estimate Equation (1) via a Seemingly Unrelated Regression (SUR) system that combines the "Weak" and "Strong" groups. The SUR estimation provides the joint variance-covariance matrix that we use to construct tests to compare cross-equation restrictions. To preserve space, we do not report the coefficients of the control variables (whose definitions can be found in the Appendix). The sample period spans from 1997 to 2007. All estimations include broker fixed effects, country fixed effects, and year fixed effects. The estimations correct for heteroskedasticity and within-broker error clustering. We report *t* statistics in brackets. ** and * denote statistical significance at the 1 and 5 level, respectively.

| Dependent variable: | Brokers' Optimism | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Sanction Severity | | | Supervisory Power | | | Sanctions LLS (2006) | | |
| | Weak | Strong | *F*-test: (W-S) | Weak | Strong | *F*-test: (W-S) | Weak | Strong | *F*-test: (W-S) |
| | (1) | (2) | (*p*.value) | (3) | (4) | (*p*-value) | (5) | (6) | (*p*.value) |
| Affiliated | 0.231** | 0.263** | 0.49 | 0.249** | 0.241** | 0.92 | 0.240** | 0.246** | 0.9 |
| | [5.98] | [16.95] | | [4.50] | [14.63] | | [4.91] | [14.67] | |
| MAD | 0.020 | 0.016 | 0.83 | 0.006 | 0.027 | 0.27 | 0.001 | 0.033 | 0.07* |
| | [0.61] | [1.55] | | [0.21] | [0.78] | | [0.05] | [0.88] | |
| Affiliated×MAD | -0.170** | -0.275** | 0.05** | -0.162** | -0.248** | 0.07* | -0.157** | -0.259** | 0.06* |
| | [5.48] | [4.48] | | [4.28] | [7.53] | | [4.20] | [8.20] | |
| Control Variables | Yes | Yes | | Yes | Yes | | Yes | Yes | |
| #Observations | 159,703 | 101,555 | | 119,730 | 141,530 | | 131,262 | 129,998 | |
| $R^2$ | 0.05 | 0.03 | | 0.05 | 0.03 | | 0.04 | 0.03 | |

*Table VII*. The impact of MAD on brokers' over-optimism – Public Enforcement

This table presents results of regressions examining whether the impact of MAD on brokers' over-optimism (Equation (1)) depends on the strength of public enforcement. The unit of analysis is a stock recommendation. The dependent variable, *Optimism*, is a metric that assesses the optimism of broker b, at time t, compared to peer brokers who issued a recommendation on stock i. Affiliated is a dummy variable that equals 1 if the issuing broker had investment banking business with the recommended firm during the preceding year. MAD is a dummy variable that equals 1 after the transposition of MAD into national laws and 0 before. We partition countries based on three proxies for the severity of legal sanctions. In columns (1) and (2), we partition the sample based on the staffing of financial supervisors (from Jackson and Roe (2009)). In columns (3) and (4), we partition the sample based on budget of financial supervisors (from Jackson and Roe (2009)). In columns (5) and (6), we partition the sample based on the index of public enforcement developed by La Porta et al. (2006). For each variable, we assign a country into the "Weak" group if it has value below the sample median and in the "Strong" group if it has value above the sample median. We estimate Equation (1) via a Seemingly Unrelated Regression (SUR) system that combines the "Weak" and "Strong" groups. The SUR estimation provides the joint variance-covariance matrix that we use to construct tests to compare cross-equation restrictions. To preserve space, we do not report the coefficients of the control variables (whose definitions can be found in the Appendix). The sample period spans from 1997 to 2007. All estimations include broker fixed effects, country fixed effects, and year fixed effects. The estimations correct for heteroskedasticity and within-broker error clustering. We report *t* statistics in brackets. ** and * denote statistical significance at the 1 and 5 level, respectively.

| Dependent variable: | Brokers' Optimism | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Staff per mio. Population | | | Budget per bn. $GDP | | | Enforcement LLS (2006) | | |
| | Weak | Strong | *F*-test: (W-S) | Weak | Strong | *F*-test: (W-S) | Weak | Strong | *F*-test: (W-S) |
| | (1) | (2) | (*p*-value) | (3) | (4) | (*p*.value) | (1) | (2) | (*p*-value) |
| Affiliated | 0.269** | 0.225** | 0.31 | 0.278** | 0.218** | 0.14 | 0.245** | 0.241** | 0.94 |
| | [8.58] | [8.98] | | [10.52] | [8.87] | | [4.88] | [14.57] | |
| MAD | -0.006 | 0.039 | 0.01** | -0.001 | 0.035 | 0.06* | 0.001 | 0.032 | 0.07* |
| | [0.21] | [0.96] | | [0.05] | [0.90] | | [0.05] | [0.87] | |
| Affiliated×MAD | -0.156** | -0.255** | 0.03** | -0.160** | -0.260** | 0.02** | -0.160** | -0.259** | 0.05** |
| | [5.09] | [10.48] | | [5.62] | [11.65] | | [5.01] | [7.92] | |
| Control Variables | Yes | Yes | | Yes | Yes | | Yes | Yes | |
| #Observations | 129,077 | 132,183 | | 131,627 | 129,633 | | 126,534 | 134,726 | |
| $R^2$ | 0.04 | 0.04 | | 0.04 | 0.04 | | 0.05 | 0.03 | |