

Regulating Conflicts of Interest: The Effect of Sanctions and Enforcement

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Abstract

This paper studies whether and how the recent Market Abuse Directive (MAD) mitigated analysts' conflicts of interest emanating from investment banking activities in Europe. Our methodology exploits the staggered adoption of MAD across countries and uses the heterogeneity in legal sanctions and enforcement that exists within Europe to identify the *causal* impact of the new regulation. We first document that conflicts of interest were prevalent in Europe in the pre-regulation period. Second, we estimate that, on average, the enactment of MAD modified the behavior of analysts and reduced significantly their conflicts. Lastly, we find that the disciplining effect of MAD on conflicted research is stronger in countries where the enforcement of legal provision is strict and the sanctions linked to MAD violations are more severe.

Key words: Financial Regulation, Conflicts of interest, Recommendations, Market Abuse Directive, Law and Finance, Enforcement, European Community.

JEL classification: G12, G14, G24, G28, K22, M48

1. Introduction

Over the past decade, 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, various regulatory agencies have recently taken actions to curb conflicted equity research and to enhance the quality of analysts' output. Focusing unilaterally on the U.S. markets, existing research indicates that regulatory changes have significantly attenuated the conflicts of interest related to investment banking.¹ In particular, after the adoption of the Regulation Fair Disclosure (RegFD) in 2000, the Sarbanes-Oxley Act (section 501) and the Global Analyst Research Settlement in 2002, analysts issue investment recommendations that are markedly less tainted by conflicts of interest. While the U.S. evidence points out that the behavior of sell-side analysts has significantly changed after the passage of these regulations, it remains unclear what forces are truly responsible for the observed changes. Indeed, as emphasized by La Porta, Lopez-de-Silanes, and Shleifer (2006), Coffee (2007) or Jackson and Roe (2009), the success of securities regulation depends on how the regulation is designed, but also crucially on the associated legal sanctions and their practical enforcement.

In this paper, we shed new light on the impact of regulation designed to limit conflicted equity research by analyzing the regulatory change that recently occurred in the European Community (EC). In 2003, the European regulators decided to enact the Market Abuse Directive (MAD). Similar to the U.S. regulatory changes, the purpose of MAD was to curb conflicts of interest in equity research by limiting ties between research and investment banking departments, and by creating stringent disclosure requirements. This change in the European regulatory landscape comprises two desirable features. First, due to the absence of 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 regulation applies equally to all member states, the penalties for violations and the actual enforcement vary across countries. As such, the passage of MAD represents a useful laboratory to assess the role of sanctions and enforcement in mitigating conflicted equity

¹ 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.

research. Second, 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 allows us to more cleanly isolate the causal effect of MAD on conflicts of interest from other confounding factors such as other contemporaneous events, macroeconomic shocks, or general time trends. As such, MAD represents a natural experiment that permits a better identification of the effect of the regulatory change than prior studies that concentrate on a single event, i.e. research on the U.S. regulatory changes.

Within this setting, we follow previous research (e.g. Barber, Lehavy, McNichols, and Trueman (2006), Ljungqvist, Marston, Starks, Wei, and Yan (2007), or Kadan, Madureira, Wang, and Zach (2009)) and examine the nature of brokers' stock recommendations around the European regulatory change. To precisely identify conflicts of interest, we rely on the exact provisions of the European Directive. Under MAD, any recommendation made by a broker on a firm for which it has acted as underwriter or adviser over the last year is considered as being exposed to conflicts of interest.² We label these recommendations as *affiliated*. Across a large sample of recommendations made on stocks listed in thirteen European countries between 1996 and 2007 (268,199 recommendations), we start by documenting that, in the pre-MAD era, affiliated brokers clearly showed signs of conflicted output since they issued overly optimistic recommendations. The distribution of recommendations issued by affiliated brokers is considerably tilted towards more optimistic investment recommendations. While "Sell" and "Strong Sell" account for 18.09% of non-affiliated recommendations, they only represent 6.82% of the recommendations issued by affiliated brokers. Likewise, the proportion of "Buy" and "Strong Buy" is significantly larger for affiliated (62.29%) than for non-affiliated (46.71%). Although the distribution of recommendations from affiliated brokers appears more balanced in Europe than in the U.S. (e.g. Ertimur, Sunder and Sunder (2006), or Kadan et al. (2009)), these descriptive results indicate that conflicts of interest existed in Europe before the enactment of MAD.

² Note that the Sarbane-Oxley Act (section 501) has exactly the same definition.

Using a difference-in-differences regression methodology, we show that the passage of MAD has significantly mitigated the effect of conflicts of interest on equity research. To capture 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 find that the over-optimism bias of affiliated brokers decreased by more than 82% in the aftermath of MAD. Furthermore, confirming the curbing effect of MAD, we document that its provisions do not percolate to investment banking relationships that are not covered by the new regulation. Brokers only fall under the scope of MAD if they recommend firms for which they acted as underwriter or adviser over the past twelve months. We show that the *older* relationships that are not covered by MAD are still related to excessively favorable recommendations. Interestingly, brokers reduce their over-optimism only when they are under the scope of MAD, but continue to favor their investment banking clients when MAD does not apply to them. By and large, this first set of results indicates that MAD has materially contained conflicts of interest in the European financial analysis industry.

We conduct extensive robustness tests that confirm the validity of this finding. Notably, additional analyses reveal that the effect of MAD on brokers' recommendations is robust to various econometric specifications and to the endogeneity of brokers' coverage. In addition, we check that the impact of the European regulation is not confounded with other events occurring around the adoption of MAD. In particular, we demonstrate that our results are not driven by the worldwide reaches of the U.S. regulations that were adopted shortly before MAD (e.g. Hovakimian and Saenyasari (2010)). A detailed event-time analysis reveals that affiliated brokers only stopped favoring investment banking clients *after* the passage of MAD and not after the implementation of U.S. regulations. In addition, we find no evidence that brokers that have to comply with the U.S. regulations transmit the U.S. provisions to their European recommendations.³ American brokers and brokers that were directly charged in the Global Research Settlement continued to favor the European stocks for which they

³ Public statements made by some U.S. banks suggest that they voluntarily apply the U.S. stringent rules to their operations abroad. For example, Goldman Sachs reported (September 2007): "*The firm is subject to a 'Global Research Settlement' entered by a United States District Court on October 31, 2003. Whilst not required to do so, the firm has applied the terms on a global basis, subject to limited variations in response to local market practices outside the United States.*" Available at: http://www2.goldmansachs.com/client_services/global_investment_research/ukpolicy.html

acted as underwriter or adviser during the two years that followed the adoption of U.S. regulations, but stopped doing so after MAD was enacted.

Next, we exploit the cross-country dimension of our sample to examine the role played by sanctions and enforcement. To start, we estimate the effect of MAD on conflicted research for each country separately. This analysis highlights two notable insights. First, in the pre-MAD period, the magnitude of the affiliation 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 49.75% in Sweden to more than 100% in Finland or Portugal, where affiliated brokers became slightly (over-) pessimistic.

We find suggestive evidence that this heterogeneity is related to the severity of the legal sanctions applicable in cases of violations of MAD. To do so, we gather specific information on the potential sanctions in cases of violations of MAD articles from the Committee of European Securities Regulators (CESR).⁴ For each country, we aggregate the relevant pecuniary administrative sanctions and criminal sanctions including imprisonment and fines that would occur in cases of violation to construct an index of sanction “severity” in the context of MAD. We document that the effect of MAD is marginally stronger in countries where sanctions are strong. After MAD, the over-optimism of affiliated brokers declined by more than 95% in countries equipped with severe sanctions (e.g. Ireland or France) but only decreased by 59% in the countries where sanctions are milder (e.g. Scandinavian countries).

We also uncover that the strength with which each country enforces its securities laws has a large impact on the effectiveness of MAD to curb conflicted equity research. In contrast with the U.S., the EC almost exclusively relies on public enforcement (e.g. La Porta et al. (2006), or Coffee (2007)). On this ground, we use two resource-based proxies capturing the level of countries’ public enforcement intensity from Jackson and Roe (2009) and estimate that the reduction of conflicts of

⁴ Specifically, we use the 2008 report of the Committee of European Securities Regulators (CESR) entitled: “*Report on Administrative Measures and Sanctions as well as the Criminal Sanctions available in Member States under MAD*”

interest in the aftermath of MAD is larger when countries allocate more resources, both in terms of budget and staffing, to their financial regulators. Interestingly, 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 of MAD to vary from one country to another, and adjust their behavior accordingly. Overall, the cross-country results have important implications for the expected outcomes of future regulatory reforms and the efforts to harmonize regulation across countries.

This paper contributes to the literature in several ways. First, our results contribute to the literature on conflicts of interest of sell-side equity analysts and the impact of legal attempts to mitigate these conflicts. While existing studies unilaterally concentrate on the U.S. markets (e.g. Barber, et al. (2006), or Kadan et al. (2009)), we are the first, to the best of our knowledge, to document the existence of conflicted equity research due to investment banking ties in Europe. 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. Also, by exploiting the staggered implementation of the same regulation in thirteen different countries, our analysis reveals that the MAD reached part of its objectives by significantly reducing the over-optimism bias of affiliated brokers. Notably, our research design offers a sharper identification of the causal effect of the new regulation than prior studies relying on regulatory changes occurring in a single country, at one point in time. In addition, our setting allows us to show that the reduction of conflicts of interest in Europe does *not* come from the worldwide reaches of the U.S. regulations that were implemented shortly before MAD. Moreover, the fact that U.S. brokers continued to be conflicted on their European recommendations after the adoption of the U.S. regulations but only changed after MAD indicates that brokers adjust their behavior to the legal framework in which they operate.

Furthermore, we add to the growing literature that stresses the crucial role played by legal sanctions and the strength with which countries enforce their laws. While the idea that legal sanctions and public enforcement affect financial outcomes is not new, the extant evidence has so far remained quite limited. Some studies 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 (La Porta et al. (2006) or Jackson and Roe (2009)). 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 approach to estimate other microeconomic consequences of enforcement (e.g. Hope (2003), or Bushman, Piotroski, and Smith (2005)). Our paper brings three novelties to this literature. First, we show that the strength with which countries enforce their laws significantly affects brokers' incentives to produce biased research after the introduction of MAD. Second, because we examine a regulation whose provisions *equally* apply across several countries, our methodology can truly isolate the effect of enforcement on brokers' behavior from the other effects coming from differences in regulatory provisions.⁵ Third, we create a specific measure of sanction severity and show that it is related to brokers' conflicts of interest and their reaction to the new regulation.

Finally, our paper is one of the few that empirically looks at the impact of MAD on financial outcomes. One notable exception is the recent study by Christensen, Hail, and Leuz (2010) that examines the impact of MAD and the recent Transparency Directive (TD) on market liquidity and firms' cost of capital. Arguably, because European directives often generate a different timing of the implementation of a same regulation, recent changes in European regulations could represent an interesting opportunity to shed new light on the effects of various financial regulations.

In the next section, we discuss the institutional setting of MAD. Section 3 describes the sample and outlines the empirical methodology. Section 4 presents and discusses the results. Section 5 concludes.

2. The Market Abuse Directive

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

⁵ In a contemporaneous paper Christensen, Hail, and Leuz (2010) use a similar methodology.

Directive, known as MAD, was complemented by two further Commission Directives, CD 2003/124/EC and CD 2003/125/EC.⁶ 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. Finland, France, Ireland, Italy, Netherlands, Great Britain and Spain) and the first semester of 2006 (Belgium and Portugal).

The objective of MAD is 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 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.⁸ 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.

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 (Art.18.).

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

⁸ Before the adoption of MAD, the proportion of recommendations issued by teams accounted for 20% of the recommendations issued by European brokers, see Bolliger (2004).

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 M&As over the twelve months preceding the recommendation must disclose this information.⁹ 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.

While the terms of MAD apply equally to all countries through their incorporation into national laws, their enforcement and the associated legal sanctions remain ultimately in the hands of

⁹ Note that this categorization is identical to SOX501, sec.15d, b), 3).

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 (CESR) wrote a “*Report on Administrative Measures and Sanctions as well as the Criminal Sanctions available in Member States under MAD*”.¹⁰ This report highlights substantial differences in administrative and penal sanctions across countries.¹¹ 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”.¹² 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.

Because brokers from a country can issue recommendations on firms that are located in a different country, it is important to know which jurisdiction is responsible to enforce the law. When a broker (or its subsidiary) and a recommended firm are 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. But, when the broker and the firm are not under the supervision of the same national

¹⁰ This report is available at http://www.cesreu.org/index.php?page=document_details&id=4975&from_id=22.

¹¹ 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.

¹² This lack of convergence motivated a “public consultation on a revision of the Market Abuse Directive” initiated in 2010 by the European Commission.

authority, e.g. when Barclays Bank (U.K.) issues a recommendation on L'Oréal (France), the determination of the competent jurisdiction is not straightforward¹³. In practice, however, the plaintiff and the listed firm are often under the same jurisdiction, e.g. French investors or the French regulator initiating a legal procedure against a foreign broker. Therefore, the enforcement is very likely to take place in the country where the firm is listed. This is the rule that we retain in the subsequent analysis. In what follows, we exploit these institutional differences to shed light on the impact of MAD on conflicts of interest.

3. Data and methodology

3.1. Sample construction

To identify the presence of potential conflicts of interest in Europe 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)).

On this basis, our initial sample consists of all stock recommendations on the firms listed in Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, the Netherlands, Portugal, Spain and Sweden from the June 2008 version of I/B/E/S International Historical Detail File.¹⁴ We cover a period that starts January 1st, 1996 and ends on December 31th, 2007. We eliminate firms if the country of their primary listing is different from the country where they are incorporated.¹⁵ As MAD provisions apply specifically to *brokers*, we retain only recommendations issued by brokers

¹³ On January 23rd, 2009, the Commission of the European Community 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 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".

¹⁴ Ljungqvist, Malloy and Marston (2009) mention that versions of the I/B/E/S U.S. Historical Detail File database released after 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.

¹⁵ We found 50 firms that are primarily listed in a country that is different from their incorporation country.

who have their headquarters or a branch under the jurisdiction of a Member State of the EC. I/B/E/S reports ratings from 1 (“Strong Buy”) to 5 (“Strong Sell”). To make the ratings system more intuitive, 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.¹⁶

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*.

Note that the identification of the exact date at which MAD was effective is not straightforward. As a matter of fact, the whole process leading to MAD was first initiated before 2003

¹⁶ We identify thirty-two days for which individual brokers made more than two hundred recommendations on a single day. 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).

by the adoption of codes of ethics at the national and international levels, followed by European Commission Directives and, eventually, by the transposition of these directives into national laws. This lengthy process makes it difficult to precisely identify a unique date for the adoption of MAD. Since the enforcement of the law is ultimately country-specific, we retain the date at which the corresponding law was enacted in each country. Note that this choice is rather conservative as it makes it more difficult to detect any effect of the regulation.

3.2. Difference-in-differences methodology

To appraise the causal 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:

$$Optimism_{b,i,c,t} = \alpha + \gamma_0 Affiliated_{b,i,c,t} + \gamma_1 MAD_{c,t} + \gamma_2 [Affiliated_{b,i,c,t} \times MAD_{c,t}] + \Gamma' \mathbf{X}_t + \varepsilon_{b,i,c,t} \quad (1)$$

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, $Optimism_{b,i,c,t}$ is the recommendation issued by broker b on stock i (of country c) at time t , minus the average recommendation across all brokers covering stock i at time t , except broker b .¹⁷ This variable provides a direct metric to assess whether a broker is optimistic, pessimistic or neutral compared to peer brokers who issued recommendations on the same stock.¹⁸ $Affiliated$ is a dummy that equals one for recommendations made by brokers classified as affiliated and zero otherwise. Hence, the coefficient γ_0 measures whether affiliated brokers are optimistic ($\gamma_0 > 0$) or pessimistic ($\gamma_0 < 0$) relative to other non-affiliated brokers. If affiliated brokers favor the companies with which they do

¹⁷ More precisely, the average recommendation (consensus) is computed using the most recent recommendations issued by brokers covering the firm. We exclude recommendations issued more than a year before the current recommendation.

¹⁸ For each broker, we retain the most recent recommendation.

investment banking business, we expect this coefficient to be positive. The variable *MAD* equals one after MAD has been enacted in country c at time t and zero otherwise. This 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 (α).

The coefficient of interest in equation (1) is on the interaction between *Affiliated* and *MAD* (γ_2). To wit, this coefficient identifies whether there exists 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.¹⁹ Panel B of Table 1 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, our methodology mitigates concerns that often arise about the endogeneity of the regulation and the timing of its adoption (e.g. Ball (1980), or Mulherin (2007)). Moreover, our set of fixed effects captures any time-invariant unobserved heterogeneity across brokers, countries and periods.

Also, in line with empirical studies on stock recommendations, specification (1) includes variables that control for other potential time-varying determinants of brokers' optimism (\mathbf{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 ($\log(\#Firms\ covered)$).²⁰ Then, to capture a stock's information environment, we include the number of brokers who issued at least one

¹⁹ Christensen et al. (2010) use a similar difference-in-difference approach to study the impact of MAD on firms' liquidity and cost of capital.

²⁰ The size of the broker is often approximated by the number of analysts they employ; we cannot use such a proxy because of teams.

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 when a recommendation represents an initiation 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, Kim, Krische, and Lee (2004) and Kadan et al. (2009)). We detail the construction of all the variables in Appendix A. We further adjust estimated standard errors for within-broker error clustering and heteroskedasticity.²¹

3.3. Descriptive statistics

Table 1 reports descriptive statistics for our sample of European stock recommendations. Overall, the sample covers 268,199 recommendations for 5,141 firms, issued by 267 brokers (pure brokerage houses and investment banks). The U.K., Germany, and France account for 68.80% of the covered firms and 61.37% of the recommendations. Table 1 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 18.54% of “Strong Buy” and 28.54% of “Buy” recommendation compared to 12.63% of “Sell” and 5.30% 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.

²¹ Clustering at the broker level is justified by the fact that observations for the same broker may not be independent within our panel; see Petersen (2009) and Gow, Ormazabal and Taylor (2010).

represent 3.30% (e.g. Jegadeesh and Kim (2006)) to 5.70% (e.g. Howe, Unlu and Yan (2009)) of the recommendations as opposed to 17.93% in our sample.²²

[Insert Table 1 about here]

Table 2 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 2.31% (6'190 recommendations out of 268'199). These recommendations were issued by 101 different brokers (94 before and 63 after MAD), which issued 78% of the recommendations in our sample (78.4% before and 74.1% 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 2.20% before MAD, it slightly increased to 2.65% after MAD. Panel A also indicates that this proportion has been stable over time, ranging from 1.34% to 3.04% 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 5.17% of all U.S. recommendations come from affiliated brokers.²³ When we extend the definition of affiliation period from a one-year (as defined in MAD) to a two-year (three-year) period, a definition more in line with previous U.S. research, this proportion increases to 3.54% (5.35%). Consistently, the proportion of recommendations issued by brokers who never participated in investment banking activities represents 19.4% in our European sample as compared to 15% in the U.S. as shown by Cowen, Groysberg, and Healy (2006) or Ertimur et al. (2006).

[Table 2 about here]

When we specifically focus on affiliated brokers in the pre-MAD period (Table 2, 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 18.09% of non-affiliated recommendations, they only represent 6.82% of the recommendations issued by affiliated brokers. Likewise, the proportion of “Buy” and “Strong Buy” is larger for affiliated (62.29%) than for non-

²² Barber et al. (2006) document a strong increase of “Sell” and “Strong Sell” recommendations from September to December 2002 (just after the enactment of SOX) up to 15% of total (close to the European figures). Whether this change has become permanent, is not reported in U.S. recent research.

²³ 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 5 years or for a firm's SEO in the past 2 years.

affiliated (46.71%). 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 10.59%, whereas the proportion of “Buy” and “Strong Buy” decreases to 53.11%. We do not see a similar shift for non-affiliated brokers (18.42/47.02 % 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 4.93% in Austria and 1.59% in Finland. However, no specific country appears to host the bulk of affiliated brokers.

4. The impact of MAD on conflicts of interest

4.1. Difference-in-differences results

We start our regression analysis by examining the average effect of MAD on brokers’ recommendations. Table 3 displays results from an OLS estimation 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 brokers issued relative recommendations that are 0.179 (t-statistic of 9.15) 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), or Loh, (2009)).

[Insert Table 3 about here]

Looking at the impact of MAD, we notice that the enactment of MAD significantly lessened the optimism bias of affiliated brokers. Indeed, the coefficient on *Affiliated* \times *MAD* is negative and significant (-0.148 with a t-statistic of 5.53). In terms of economic magnitude, this represents an 82%

reduction in the affiliation bias.²⁴ 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 ($0.179 - 0.148 = 0.031$, statistically not different from zero at 10%). 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.

[Insert Figure 1 about here]

To have a different perspective on the impact of MAD on conflicted research, we estimate year-by-year regressions to get annual estimates of the affiliation bias. Figure 1 plots the evolution of the affiliation bias over time. Confirming our previous results, we observe a sharp reduction in the affiliation bias in 2004, the year of the first implementation of MAD (in Germany). Indeed, the affiliation bias drops from above 0.2 in 2003 to slightly more than 0.1 in 2004. After 2004, we see a permanent decrease in the affiliation bias. Taken together, this first set of results highlights two notable facts. First, similar to what has been documented in the U.S., the European financial analysis industry was indeed plagued by conflicts of interest in the pre-MAD era. Second, the provisions of the European regulation appear to have curbed a large part of the conflicted research on average.

To complement these findings, we examine whether the brokers who are potentially subjected to conflicts of interest but that are *not* covered by MAD similarly altered their behavior. When designing MAD, the European regulator has delineated potential conflicts of interest to a one-year period after the last deal is completed. Arguably, investment banking relationships may last longer than a year. Technically, these older relationships are not under the scope of MAD. Hence, if a broker advised a firm thirteen months before recommending it, it does not have to comply with MAD's provisions. In the rest of Table 3, we assess whether MAD also altered the over-optimism of brokers who had previous investment banking ties with recommended firms but that are not under the scope of MAD. In column 2, we consider as affiliated, brokers who had investment banking ties with the firm between twelve to twenty-four months before the current recommendation (we eliminate from the

²⁴ We compute the percentage reduction in the affiliation bias directly from the estimated coefficients as $-I \times (\gamma_0 + \gamma_2) / \gamma_0$.

sample, affiliated recommendations as defined by MAD) . There are 3,306 recommendations issued by 87 different brokers that fall into this category. The dummy variable *Affiliated* identifies these observations. We observe that the coefficient on *Affiliated* is positive and significant (0.122 with a *t*-statistic of 5.92).²⁵ Brokers who had investment banking ties with a firm more than a year before the current recommendation also displayed over-optimism before MAD. Even though MAD marginally decreases the over-optimism of these brokers, the estimates further reveal that they continue to issue biased recommendations after the enactment of MAD. Indeed, the global effect of *Affiliated* and *Affiliated*×*MAD* is statistically significant at the 5% level (0.122 - 0.061 = 0.061). We obtain similar results when we account for investment banking ties that occurred between twenty-four to thirty-six months before the current recommendation (as before, we eliminate from the sample affiliated recommendations up to twenty-four months). This category comprises 2,098 recommendations issued by 77 distinct brokers. In column 3, these older relationships are captured by the dummy variable *Affiliated*. The coefficient on *Affiliated* turns out to be significantly positive (0.052 with a *t*-statistic of 2.08) and MAD does not eliminate such over-optimism. Interestingly, whereas the passage of MAD limits overly optimistic recommendation of the targeted brokers, affiliated brokers who are not covered by MAD's provisions, continue to exhibit a substantial affiliation bias. Consistent with a causal impact of MAD, affiliated brokers materially reduce their over-optimism *only* when they are under the scope of MAD, but continue to favor their investment banking clients when MAD does not apply.

4.2. Sensitivity Analysis

We assess the validity of our results in two different ways. First, we check that our inference is robust to various estimation methodologies and sample selection. Second, we verify that the estimated effect of MAD is not affected by confounding factors that could have occurred contemporaneously to the adoption of MAD. Table 4 reports various estimations of the baseline specification (1). The first column reports the regression results when we estimate equation (1) using the Fama and MacBeth

²⁵ In this estimation, we exclude the recommendations issued by brokers who had investment banking ties with the recommended firm in the twelve months that preceded the current recommendation.

(1973) approach. In column 2, as suggested by Ljungqvist et al. (2007), we remove the assumption that brokers' heterogeneity is time-invariant (i.e. the inclusion of broker fixed effects) and estimate equation (1) using a broker random-effect model.²⁶ Similarly, we replace the broker fixed effects by stock fixed effects in column 3, thereby removing any stock-specific optimism. Also, because the dependent variable in specification (1) is bounded in the $[-4, 4]$ interval, we estimate an Ordered Probit specification (column 4) where the dependent variable can take three different values: unfavorable ("Sell" and "Strong Sell"), neutral, and favorable ("Buy" and "Strong Buy"). Remarkably, across all these modifications, our results remain qualitatively unchanged. We continue to observe a large and significant curbing effect of MAD on the over-optimism of affiliated brokers.

[Insert Table 4 around here]

The rest of Table 4 presents further robustness checks. In columns 5 to 7, we gauge whether our results are mostly driven by countries with a large number of recommendations. So, we estimate specification (1) but exclude recommendations issued on British firms (column 5), French firms (column 6), and German firms (column 7). We continue to observe a significant reduction of the affiliation bias. Next, we examine the potential biases introduced by the endogeneity of brokers' coverage. As a matter of fact, existing research suggests a selection bias in coverage because brokers tend to cover stocks on which they have a positive view (e.g. McNichols and O'Brien (1997)). Because MAD alters the relative cost of issuing recommendations, affiliated brokers could have decided to devote more of their research time to certain stocks, i.e. stocks on which they are less over-optimistic. Note, however, that the descriptive statistics in Table 2 show no decrease in the recommendation activity of affiliated brokers. If anything, the fraction of recommendations issued by affiliated brokers has slightly increased after MAD (from 2.20% to 2.65%). Still, to address a potential self-selection bias, we check whether our results continue to hold for the largest companies. As argued by Kolasinski and Kothari (2008) and Ljungqvist et al. (2007), brokers have less discretion with respect to covering the largest companies, so selection is less likely to play a role in those cases. In each country-year, we rank firms based on their market capitalization and estimate specification (1) for

²⁶ Specifically, we estimate equation (1) using a GLS estimator with broker random effects.

the largest 50% (column 8), 25% (column 9) and 5% (column 10). We note that the over-optimism bias is slightly larger when brokers issue recommendations on large firms they have business with. Clearly, the potential profits from acting as underwriter or adviser on these large firms are higher. Nevertheless, we continue to observe that the passage of MAD significantly reduced the optimism on affiliated brokers when they recommend the large companies. Overall, the results are in line with those reported for the whole sample.

Even though our identification strategy rests on the *staggered* implementation of MAD across European countries, the effect of MAD might still be confounded with other events occurring around the enactment of MAD. One particular concern is that our results are due to the worldwide reaches of U.S. regulations. Indeed, RegFD, NASD Rule 2711, NYSE Rule 472 and the Global Research Settlement were enacted two years before MAD. Hence, because these regulations materially reduced the over-optimism of affiliated brokers in the U.S. (e.g. Kadan et al. (2009)), it is possible that our estimates simply reflect the spillover effects of U.S. regulations on the European markets (e.g. Hovakimian and Saenyasari (2010)). We perform several tests that dismiss this possibility.

First, 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 specification (1) but replace *MAD* by the set of event-time dummies. Figure 2 exhibits the evolution of the affiliation. We observe a slight decline in the affiliation bias (γ_0 goes from 0.193 to 0.173) before the passage of MAD.²⁷ Nevertheless, we see a massive reduction in the bias during the year that follows MAD (γ_0 goes from 0.173 to 0.070). While the pre-MAD decrease can be due to some minor spillovers of U.S. regulatory reforms, Figure 2 indicates that the bulk of the effect materializes *after* MAD was enacted and cannot solely be explained by the new U.S. regulations.

[Insert Figure 2 about here]

²⁷ This decrease can reflect a limited effect of U.S. regulations or the effect of the early adoption of MAD by Germany or Finland in 2004.

To more accurately assess the potential confounding effect of U.S. regulations, we isolate the marginal contribution of MAD by defining three consecutive sub-periods. The pre-U.S. regulation period begins in January 1997 and ends with the adoption of the U.S. regulations. The interim period goes from the adoption of the U.S. regulations to the country-specific adoption of MAD. Finally, the last sub-period goes from the adoption of MAD to the end of the sample period (December 2007). For completeness, we consider two waves of U.S. regulations, RegFD (October 2000) and NASD Rule 2711, NYSE Rule 472 and the Global Settlement (December 2002) that we label SOX. For each regulatory event, we define a dummy variable *US* that equals one after its enactment (either October 2000 or December 2002) and zero otherwise. With this sequence of events, we have a period of twenty-two months between the last U.S. regulatory action (the Global Settlement) and the first enactment of MAD in Germany (October 2004). We have 89'453 recommendations issued before RegFD, 54'542 after RegFD but before SOX, 42'951 after SOX but before MAD, and 81'253 after MAD.

[Insert Table 5 about here]

Table 5 reports the regression results where the set of interaction terms between *Affiliated*, *US* and *MAD* isolate the over-optimism bias of affiliated brokers in each sub-period. This test is akin to a placebo analysis where we change the timing of the relevant event. In the first column we detect no significant impact of the U.S. regulations on the affiliation bias in the European industry. The coefficients on *Affiliated*×*US* are insignificant, regardless of the U.S. regulation under consideration (RegFD or SOX). The affiliation bias only declined after MAD as shown by the significance of the coefficient on *Affiliated*×*MAD*×*US*. This suggests that the U.S. regulations that were designed to curb conflicts of interest in the American markets do not explain the effect of MAD on affiliated brokers in Europe.

To further characterize this result, we look in more details at the behavior of brokers who are more likely to transmit the effects of U.S. regulations to Europe. If the implementation of U.S. regulations actually explains the modification of stock recommendations in Europe, this effect should primarily come from the behavior of brokers that have important operations in the U.S. We find no evidence for this claim. In columns 3 and 4 of Table 5, we restrict our attention to brokers who have

global operations and issue recommendations both in the U.S. and in Europe.²⁸ On average, these brokers continue to issue overly optimistic recommendations on the European stocks with which they had investment banking business relationships. However, we observe again a sharp decline of their over-optimism bias after the passage of MAD (the coefficient on *Affiliated*×*US*×*MAD* is negative and highly significant). In the rest of Table 5, we repeat the same analysis but focus only on U.S. brokers (columns 5 and 6) and on brokers who were part of the Global Settlement (columns 7 and 8).²⁹ We find very similar patterns for these two subgroups of brokers. While U.S. affiliated brokers markedly reduced their bias on U.S. markets in the aftermath of U.S. regulatory changes (e.g. Kadan et al. (2009)), they continued to favor the European companies they advised or underwrote until MAD was enacted. After MAD, they significantly cut their over-optimism. We find the same behavior for affiliated brokers who were involved in the Global Settlement. Interestingly, these findings suggest that brokers adapt their behavior to the institutional framework of the firms they recommend.

4.3. The impact of legal sanctions and enforcement

So far, we have treated all European countries as being homogenous and hence have estimated the *average* effect of MAD on conflicted equity research across Europe. However, as discussed in the introduction, MAD is not uniformly implemented and enforced across countries. Indeed, our results mask some important cross-country heterogeneity. Figure 3 displays the estimated affiliation bias by country, 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). This figure reveals considerable heterogeneity 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 exhibit an important over-optimism bias when they recommended Austrian or Swedish stocks but much less when they recommended Belgian, French or Portuguese stocks. Also, the (percentage)

²⁸ Among the whole sample of recommendations, 61% are issued by global brokers (163'770).

²⁹ Our sample comprises 13% of recommendations issued by U.S. brokers (34'345) and 17% by investment banks included in the Global Research Settlement (46'570).

reduction of this affiliation bias after MAD appears to vary considerably across countries.³⁰ It ranges between 49.75% in Sweden to more than 165% in Belgium, where affiliated brokers became *less* optimistic than unaffiliated brokers after MAD.³¹

[Insert Figure 3 about here]

In this section we explore whether this heterogeneity in the extent of conflicted research and the mitigating impact of MAD is related to systematic differences in the severity of the legal sanctions in place and the strength with which each country enforces the law. To capture such differences in legal sanctions, we construct an index of sanction severity (*Sanctions*). To do so, we collect information related to 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).³² From the CESR report, we gather information on the country-specific sanctions that accompany the new regulation. We divide the sanctions associated to MAD into three categories: the administrative pecuniary sanctions, the criminal sanctions, and the fines. For each country and each type of sanctions, we gather the maximum hypothetical sanction that would prevail in case of violation of MAD’s articles. As already mentioned in Section 2, we observe substantial differences across countries. With this data, we create an index (*Sanctions*) that is based on the relative ranking of each country for each type of sanction. Appendix B provides a detailed description of the sanction data and the index creation. On average, the U.K., Spain, and Italy have the most severe system of potential sanctions while the three Scandinavian countries use rather soft sanctions in cases of biased recommendations and market manipulations.

[Insert Table 6 about here]

In Table 6, we assess how the strictness of legal sanctions impacts conflicts of interest and the efficacy of MAD to limit these conflicts. To do so, we estimate the baseline difference-in-differences specification (1) across two groups of countries based on their associated sanctions. By estimating such a triple-differences model, we are able to assess whether a difference existed between the two

³⁰ The estimated reduction is obtained from country-by-country estimation of specification (1). Then, for each country, we compute the percentage reduction in the affiliation bias as $-1 \times (\gamma_0 + \gamma_2) / \gamma_0 (\times 100)$ directly from the estimated coefficients.

³¹ We find this pattern in four countries (Belgium, Germany, Finland, Ireland, and Portugal). Yet, the affiliation bias is never significantly negative (at a 10% confidence level).

³² Available at: http://www.cesreu.org/index.php?page=document_details&id=4975&from_id=22

groups in the intensity of the conflicts before MAD and whether the impact of MAD differs between the two groups of countries. The first column reports the results for countries characterized by a “low” level of sanctions (*Sanctions* below the median), whereas the second column presents those for countries with a “high” level of sanctions (*Sanctions* above the median). As expected, we observe no difference in the affiliation bias between the two groups before the enactment of MAD. Given that our index of sanctions is derived from MAD, the extent of conflicted research is similar across the two groups of countries in the pre-MAD era. A test of the differences between the coefficients on *Affiliated* in the two groups confirms the absence of statistical significance (p -value of 0.81).

In contrast, we see that the effect of MAD is distinct between the two groups of countries. While MAD reduced the over-optimism of affiliated brokers by around 97% in countries where the associated sanctions are strong (coefficient of -0.178 with a t -statistic of 4.41), it only *partially* reduced over-optimism by 64% in countries with weak sanctions (coefficient of -0.115 with a t -statistic of 3.51). The difference between the two groups is not significant. The difference-in-differences is only weakly significant (p -value of 0.11). Hence the magnitude of the reduction of the conflicts is marginally larger in countries where the sanctions associated with violations of MAD are severe. Taken at face value, these estimates partially support the idea that the behavior of affiliated brokers is affected by the severity of the sanctions they face. Even though MAD appears to reduce conflicts of interest in the European financial analysis industry on average, its effect is slightly larger when the enactment of MAD is accompanied by stricter sanctions.

Next, we examine whether the strength of enforcement at the country level also affects the impact of MAD on brokers’ behaviors. Recent research in law and finance suggests that the intensity of enforcement effort by securities regulators is of paramount importance to propel financial market development in general (e.g. La Porta et al. (2006), Coffee (2007), Jackson and Roe (2009) or Christensen et al. (2010)), and to improve the production of analysts in particular (e.g. Bushman et al. (2005), or Hope (2003)). Accordingly, the effectiveness of MAD to limit conflicted equity research may also be affected by the ability of each European country to enforce the provisions of MAD. However, measuring enforcement intensity is a difficult task. Researchers have taken different roads to

capture level of enforcement of securities regulations.³³ Because public enforcement is the main (if not the only) source of enforcement in Europe, we follow Jackson and Roe (2009) and use a resource-based approach to capture the country level public enforcement intensity. This approach relies on regulators' budgetary resources and staffing levels and hence measures the level of resources that a nation allocates to its financial regulator, scaled to either the nation's economic size or its population.³⁴ 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 remedy, prevent and punish wrongdoing.³⁵

From Jackson and Roe (2009), we use two measures of enforcement: the staff per million population (*Staff*) and the budget per billion US\$ of GDP (*Budget*). As detailed in Appendix B, these two variables are constructed from the 2006 and 2007 editions of "*How Countries Supervise Their Banks, Insurers and Securities Markets*". Then, to gauge how the intensity of enforcement is related to the impact of MAD, we split countries into "weak" and "strong" enforcement based on the median value of both *Staff* and *Budget* and 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.

Columns 3 to 6 of Table 6 reveal several interesting findings. First, we note that the coefficient on *Affiliated* is significantly larger in countries characterized by low enforcement intensity. In these countries, brokers tend to be more over-optimistic when they recommended firms with which they have investment banking ties in the pre-MAD era. This result holds with both measures of enforcement intensity. These notable differences suggest that, in Europe, the magnitude of conflicted equity research appears to depend on the intensity of law enforcement. This is in line with recent

³³ 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).

³⁴ 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.

³⁵ See Jackson and Roe (2009) for more detailed justifications of the resource-based approach.

research arguing that the strength of legal enforcement is an important determinant of financial behavior.

Turning to the impact of MAD, we observe that the coefficient on *MAD* turns out to be negative and significant in countries characterized by strong enforcement of laws. In these countries, the enactment of MAD reduced the over-optimism of *all* brokers issuing recommendations on European stocks. In contrast, MAD had no overall effect in countries where enforcement is weak. When we focus more specifically on affiliated recommendations, we see that MAD had a differential effect depending on enforcement intensity. Clearly, the disciplinary effect of MAD turns out to be larger when enforcement is strong. While MAD reduces the over-optimism of affiliated brokers by around 56% in countries that rank low in terms of enforcement intensity, MAD completely eliminates it in countries where enforcement intensity is high. 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.

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 analysts' over-optimism. 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. Therefore, regulation could distort competition between financial institutions located in different countries.

5. Conclusion

In this paper, we investigate the effects of a recent regulatory change designed to curb conflicts of interest in Europe. The Market Abuse Directive (MAD) was enacted in 2003 to limit the ties between equity research and investment banking departments within financial institutions and to

impose stringent disclosure requirements on potential conflicts of interest. Our analysis highlights several notable results. First, we establish the presence of conflicted equity research in the pre-MAD era. On average, brokers issued significantly more favorable recommendations on firms with which they entertained investment banking relationship. Second, difference-in-differences estimations reveal that the passage of MAD significantly reduced this practice. After MAD, we find no difference between the recommendations issued by brokers that have investment banking ties with the recommended firm, and those of unaffiliated brokers. Third, we document that the reduction in conflicts of interest in Europe does *not* come from the worldwide reaches of the U.S. regulations that were enacted shortly before MAD. U.S. brokers and brokers that were charged in the Global Research Settlement of 2002 continued to issue biased recommendations on the European stocks with which they entertained investment banking ties. They only stopped doing so after MAD was enacted. Fourth, we estimate that the curbing effect of MAD largely depends on the severity of the associated legal sanctions and the strength with which European countries enforce their laws. In particular, our results indicate that the reduction of conflicts of interest is concentrated in countries that strictly enforce their laws.

Overall our analysis offers new evidence on the role of regulation in mitigating analysts' conflicts of interest. Yet, we leave several questions unanswered, two of which we outline here. First, our paper focuses solely on the behavior of brokers. However, it would be interesting to examine whether the observed conflicts have any systematic impact on the customers of analysts' services, i.e. investors or firms. In a similar vein, future research could investigate how investors reacted to the introduction of MAD, and whether their reactions also depend on countries' institutional traits.

Also, our study highlights 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 what are the implications for the organization and development of the industry. We leave these questions to future research.

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Appendix A: Definition of and source of the variables

This table provides definitions and sources of all the variables used in the analysis.

Variable	Definition	Source
<i>Optimism</i>	The difference between the recommendation issued by broker <i>b</i> on firm <i>i</i> of country <i>c</i> at time <i>t</i> and the consensus (mean of the last recommendations issued by brokers following firm <i>i</i> during the year preceding <i>t</i>)	IBES
<i>Affiliated</i>	Dummy variable that equals 1 if broker <i>b</i> had investment banking business with firm <i>i</i> during the year preceding <i>t</i>	SDC and IBES
<i>Affiliated</i> (1-2 years)	Dummy variable that equals 1 if broker <i>b</i> had investment banking business with firm <i>i</i> from one to two years ago	SDC and IBES
<i>Affiliated</i> (2-3 years)	Dummy variable that equals 1 if broker <i>b</i> had investment banking business with firm <i>i</i> from two to three years ago	SDC and IBES
<i>MAD</i>	Dummy variable that equals 1 if the recommendation is released after MAD was enacted in country <i>c</i> (or after December 23th, 2003 when explicitly specified)	EC ³⁶
<i>US</i>	Dummy variable that equals 1 if the recommendation is released after the corresponding regulation (RegFD or SOX)	SEC
<i>Herding</i>	Dummy variable that equals 1 if the current recommendation is issued less than ten days after a recommendation on the same stock and both are either favorable or unfavorable.	IBES
<i>CER</i>	Dummy variable that equals 1 if earnings are released during the two-day period before the recommendation and 0 otherwise	IBES
<i>Prior Firm return</i>	Firm <i>i</i> stock returns during the year preceding <i>t</i>	Datastream
<i>Prior Market return</i>	Stock market returns of country <i>c</i> during the year preceding <i>t</i>	Datastream
<i>log(#Analysts)</i>	The logarithm of the number of analysts following firm <i>i</i> during the year preceding <i>t</i>	IBES
<i>log(#Firms covered)</i>	The logarithm of the number of firms followed by broker <i>b</i> during the year preceding <i>t</i>	IBES
<i>Initiation</i>	Dummy variable that equals 1 if broker <i>b</i> did not issue recommendations on stock <i>i</i> before <i>t</i> .	IBES
<i>Sanctions</i>	Index of sanction severity defined in Appendix B	CESR and own computation
<i>Staff</i>	Size of the regulatory staff that oversees capital markets, scaled by country population	Jackson and Roe (2009)

³⁶ See http://ec.europa.eu/internal_market/finances/actionplan/transposition/index_en.htm

<i>Budget</i>	Securities regulatory budget scaled by the nation's gross domestic product	Jackson and Roe (2009)
<i>Country</i>	Austria (AUT), Belgium (BEL), Denmark (DNK), Finland (FIN), France (FRA), Germany (DEU), Ireland (IRE), Italy (ITA), Netherland (NDL), Portugal (PRT), Spain (ESP), Sweden (SWE) and the United Kingdom (GBR)	

Appendix B: Sanctions and enforcement

This appendix presents the construction of a country-level measure of the severity of legal sanctions associated with MAD violations as well as two variables capturing the strength with which European countries enforce securities laws.

B1. Sanctions

To identify differences in legal sanctions associated with violations of MAD across European countries, we construct an index of sanction severity (*Sanctions*). To do so, we collect information related to 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).³⁷ Among the numerous articles that constitute MAD, four are of particular interest when it turns to legal sanctions: Article 3 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.

The CESR report provides useful information on three distinct types of the sanctions: administrative pecuniary sanctions, criminal sanctions (imprisonment), and criminal sanctions (fines and other measures). For each country and each of the four above articles, we gather the maximum hypothetical sanction that would prevail in case of a violation. Table B.1 outlines the large variation among potential sanctions 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 3 could lead to more than 10 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

³⁷ Available at: http://www.cesreu.org/index.php?page=document_details&id=4975&from_id=22

hypothetical violations of articles 3, 6.3, 6.5 and 14.3 respectively, we rank the thirteen countries based on their respective administrative pecuniary penalties. Then, we compute, for each country, the average rank for pecuniary administrative sanctions. We re-iterate this procedure for both criminal sanctions and fines. We thus obtain three rankings of the thirteen countries as presented in Table B.2. 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 B.2 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.

B2. Public Enforcement Index

As emphasized in Coffee (2007), the intensity of enforcement is probably what matters more to explain legal cross-country differences. Therefore, we turn our attention to two measures of public enforcement developed by Jackson and Roe (2009). We collect these measures of public enforcement directly from Jackson and Roe (2009, p. 214, Table 2, col. 3 and col. 6 - Extended sample with extrapolated observations-). The first variable measures the 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*). For more details on how these indexes are constructed see Jackson and Roe (2009, p. 213). To be consistent with our previous measure, we rank countries based on both regulatory staff and securities regulatory budget. Table B.3 displays the enforcement rankings by country.

To the best of our knowledge, no broker has yet been sued based on the transposition articles 3, 6.3, 6.5 and 14.3 into national laws. Without any evidence of real enforcement, we consider that enforcement of previous securities' laws is a good proxy for the future enforcement of MAD. It is worth noting that these three ranking-based indices are measuring different dimensions of the law. The rank correlations of *Sanctions* with *Staff* (0.18) and *Budget* (0.47) show that tough sanctions do not

necessarily line up with tough enforcement; see e.g. Italy. *Staff* and *Budget* are not substitute either since their correlation, albeit high (0.77), is far from one.

Table B.1: MAD sanctions

This table reports the pecuniary administrative sanctions and criminal sanctions (imprisonment and fines) for violations of articles 3, 6.3, 6.5 and 14.3; source: CESR.

	Pecuniary Administrative sanction (in EUR)				Imprisonment (in years)				Fines (in EUR)			
	Art. 3	Art. 6.3	Art. 6.5	Art. 14.3	Art. 3	Art. 6.3	Art. 6.5	Art. 14.3	Art. 3	Art. 6.3	Art. 6.5	Art. 14.3
Austria	0	30,000	30,000	30,000	5	0	0	0	0	0	0	0
Belgium	3×Profits	3×Profits	3×Profits	3×Profits	1	0	0	0	3×Profits	0	0	0
Denmark	0	0	0	0	1.5	0	0	0	0	NA	NA	0
Finland	200,000	200,000	0	0	0	0	0	0	0	0	0	0
France	10×Profits	1,500,000	1,500,000	0	1	0	0	2	10×Profits	0	0	300,000
Germany	0	1,000,000	200,000	50,000	5	0	0	0	Profits	0	0	0
Ireland	2,500,000	2,500,000	2,500,000	0	10	1	1	1	10,000,000	5,000	5,000	5,000
Italy	10×Profits	500,000	500,000	1,000,000	12	0	0	8	10×Profits	0	0	0
Netherland	96,000	96,000	24,000	6,000	2	2	2	2	Profits	Profits	Profits	Profits
Portugal	2,500,000	2,500,000	1,250,000	1,250,000	3	0	0	0	NA	0	0	0
Spain	5×Profits	Profits	5×Profits	5×Profits	6	0	0	0	3×Profits	0	0	0
Sweden	0	0	NA	0	4	0	0	0	0	0	0	0
United Kingdom	No limit	No limit	No limit	No limit	7	0	0	2	No limit	0	0	7,500

Table B.2: MAD sanctions index

This table reports the average ranking (from the highest to the lowest) of the thirteen countries in terms of pecuniary administrative sanctions, imprisonment and fines with respect to articles 3, 6.3, 6.5 and 14.3. The sum of these three rankings corresponds to the column “Total”. The country ranked first (thirteen) has the strongest (weakest) sanctions.

	Administrative	Imprisonment	Fines	Total	Sanctions (Rank)
Austria	9	4.25	5	19	10
Belgium	3	5.75	3.75	13	5
Denmark	11	5.5	5	21	13
Finland	9	6.25	5	21	12
France	6	4.75	2.5	13	5
Germany	7	4.25	4.25	16	9
Ireland	6	2.75	4	13	4
Italy	6	2	3.25	11	3
Netherland	9	3.25	2.25	15	7
Portugal	5	5	5	15	8
Spain	3	4	3.75	11	2
Sweden	11	4.75	5	20	11
United Kingdom	1	2.75	2.5	6	1

Table B.3: Public enforcement intensity

This table reports two resource-based measures of public enforcement intensity based on securities regulators’ (staffing/population and budget/GDP levels); source: Jackson and Roe (2009, p. 214). Column 1 shows the staffing levels per million of a country’s population, column 2 shows the budget of the regulatory agency (expressed in billion of GDP). Column 3 (4) represents the rank of the country in terms of Staff (Budget).

Country	Staff	Budget	Rank Staff	Rank Budget
Austria	9.97	34,464	8	7
Belgium	13.76	27,276	5	10
Denmark	10.85	25,940	7	11
Finland	11.23	45,937	6	6
France	5.91	28,851	12	9
Germany	4.43	12,903	13	13
Ireland	23.32	72,639	2	4
Italy	7.25	61,239	10	5
Netherland	23.53	131,285	1	1
Portugal	14.5	75,562	4	3
Spain	8.5	29,873	9	8
Sweden	7.19	21,988	11	12
United Kingdom	19.04	80,902	3	2

Figure 1: The affiliation bias through time

This figure reports the affiliation bias over time. 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).

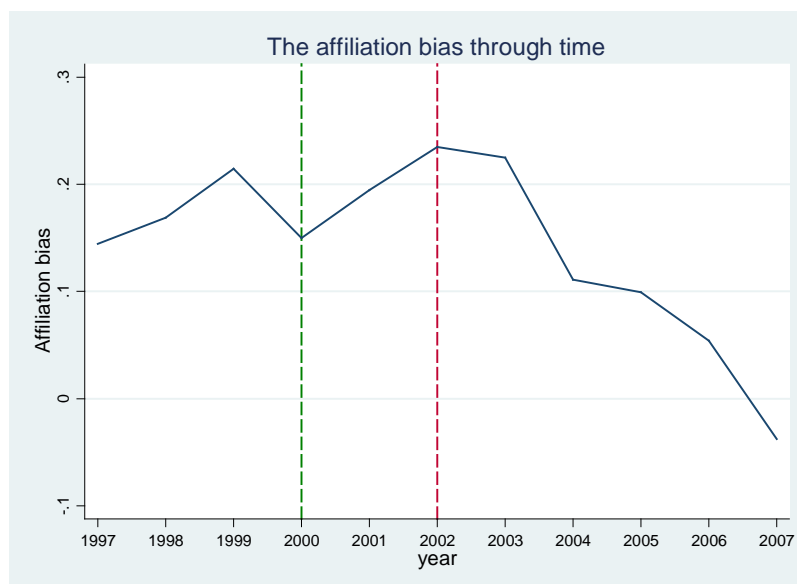


Figure 2: The affiliation bias in event-time around the enactment of MAD

This figure reports the results 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.

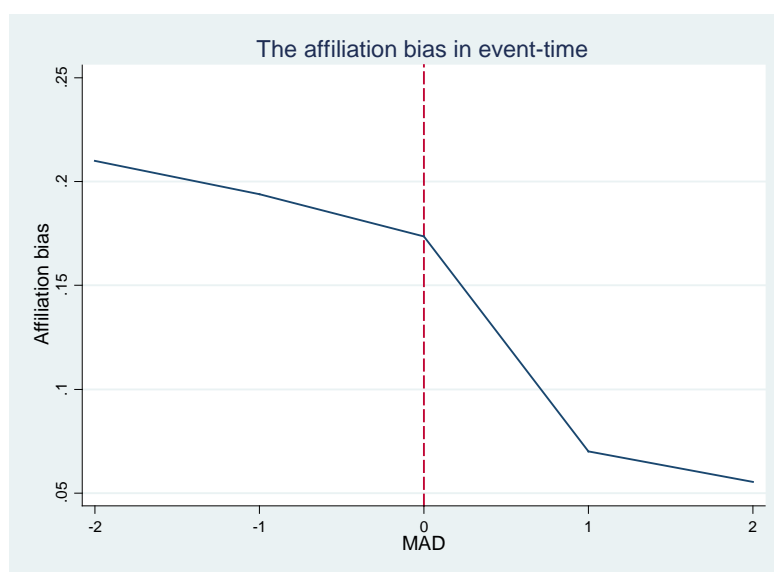


Figure 3: The affiliation bias before and after MAD across countries

This figure reports the affiliation bias before (light gray bars) and after (dark grey bars) the adoption of MAD for each country. The estimated affiliation biases are obtained from country-by-country estimations of specification (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.

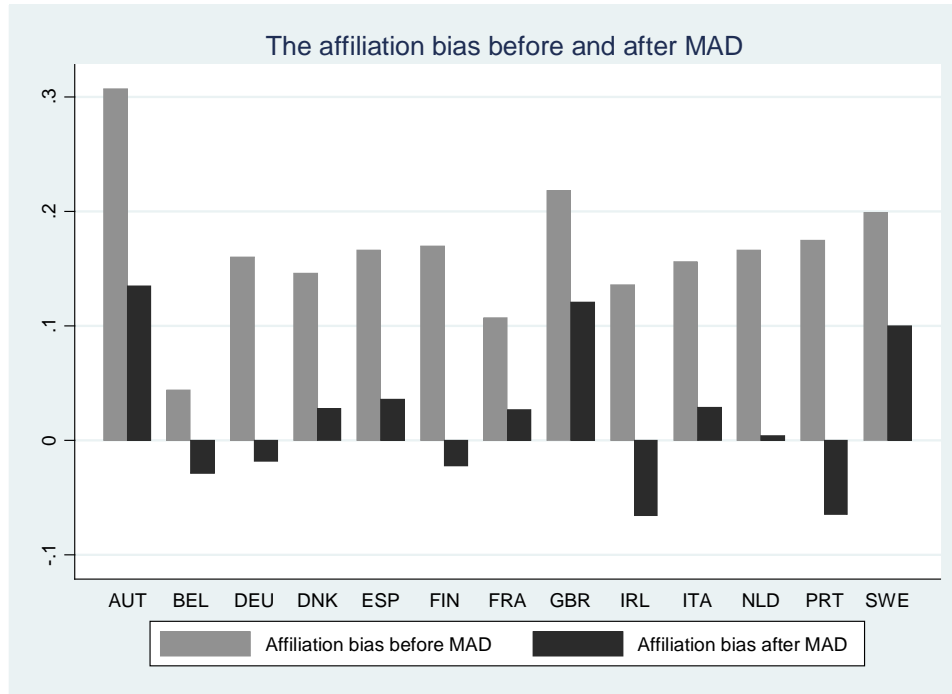


Table 1: Descriptive statistics

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). 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	MAD	Total	Strong Sell	Sell	Neutral	Buy	Strong Buy	#Firms	#Brokers
1997-2007	-	268,199	5.30%	12.63%	34.99%	28.54%	18.54%	5,141	267
1997	-	23,803	7.64%	8.05%	38.40%	22.06%	23.85%	2,514	152
1998	-	25,245	6.50%	10.79%	36.61%	26.32%	19.78%	2,594	153
1999	-	24,971	4.72%	9.43%	34.36%	30.88%	20.60%	2,660	156
2000	-	21,748	3.59%	8.88%	32.67%	33.59%	21.27%	2,571	149
2001	-	24,909	5.19%	13.08%	36.42%	28.36%	16.95%	2,538	133
2002	-	24,420	4.66%	16.16%	32.31%	31.44%	15.42%	2,283	128
2003	-	24,875	5.64%	17.73%	35.31%	29.25%	12.07%	2,271	130
2004	-	22,749	5.21%	14.11%	34.24%	30.25%	16.19%	2,350	146
2005	-	24,516	4.69%	14.73%	36.82%	27.29%	16.47%	2,611	161
2006	-	25,037	4.97%	13.62%	33.85%	27.89%	19.66%	2,710	161
2007	-	25,926	5.30%	11.96%	33.70%	27.26%	21.79%	2,569	158

Table 1: Descriptive statistics (Continued)

Panel B: By country									
Country	MAD	Total	Strong Sell	Sell	Neutral	Buy	Strong Buy	#Firms	#Brokers
Austria	01.01.2005	2,902	3.10%	9.34%	41.08%	25.91%	20.57%	111	74
Belgium	19.09.2005	7,668	3.87%	12.17%	38.55%	27.11%	18.30%	144	96
Denmark	01.04.2005	7,723	6.91%	17.66%	29.35%	29.78%	16.29%	162	91
Finland	01.07.2004	10,564	5.09%	20.21%	27.08%	34.30%	13.32%	138	98
France	27.07.2005	44,086	4.56%	14.97%	29.84%	30.78%	19.85%	722	143
Germany	31.10.2004	41,020	6.31%	12.23%	39.31%	24.49%	17.66%	669	133
Ireland	01.10.2005	1,940	1.55%	5.72%	31.24%	36.80%	24.69%	63	59
Italy	12.05.2005	15,849	3.26%	11.60%	40.82%	29.19%	15.13%	286	118
Netherland	01.10.2005	21,420	6.59%	11.07%	38.36%	24.51%	19.48%	201	136
Portugal	30.03.2006	4,095	6.76%	14.07%	32.67%	28.45%	18.05%	63	64
Spain	24.11.2005	15,315	7.06%	15.25%	30.93%	27.46%	19.30%	144	110
Sweden	01.07.2005	16,135	5.82%	17.30%	30.21%	30.85%	15.82%	292	111
United Kingdom	01.07.2005	79,482	4.90%	9.47%	36.54%	29.25%	19.84%	2,146	157

Table 2: 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” 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). Panel A displays the distribution of stock recommendations sorted by year. Panel B presents the distribution of recommendations sorted by countries.

Panel A: By year											
Year	Prop. Aff.	Affiliated					Non-Affiliated				
		Strong Sell	Sell	Neutral	Buy	Strong Buy	Strong Sell	Sell	Neutral	Buy	Strong Buy
Before MAD	2.20%	1.12%	5.70%	30.89%	38.31%	23.98%	5.47%	12.62%	35.20%	28.71%	18.00%
After MAD	2.65%	2.91%	7.68%	37.00%	34.21%	18.91%	5.14%	13.28%	34.56%	27.18%	19.84%
1997-2007	2.31%	1.42%	6.25%	32.58%	37.17%	22.57%	5.39%	12.78%	35.05%	28.34%	18.44%
1997	1.34%	2.19%	4.39%	34.80%	29.78%	28.84%	7.72%	8.09%	38.45%	21.96%	23.78%
1998	1.65%	0.24%	4.09%	29.33%	38.22%	28.13%	6.61%	10.90%	36.74%	26.12%	19.64%
1999	2.21%	1.27%	2.54%	26.13%	39.75%	30.31%	4.80%	9.59%	34.55%	30.68%	20.38%
2000	2.76%	0.67%	2.50%	24.79%	40.60%	31.45%	3.67%	9.07%	32.89%	33.39%	20.98%
2001	3.04%	1.32%	6.86%	31.13%	34.17%	26.52%	5.31%	13.28%	36.58%	28.17%	16.65%
2002	2.10%	0.59%	7.62%	29.49%	39.45%	22.85%	4.75%	16.35%	32.37%	31.27%	15.26%
2003	2.00%	0.80%	10.44%	37.95%	41.37%	9.44%	5.73%	17.88%	35.26%	29.01%	12.12%
2004	2.44%	1.26%	6.14%	32.67%	40.97%	18.95%	5.31%	14.31%	34.28%	29.98%	16.12%
2005	2.76%	2.22%	8.73%	36.24%	35.06%	17.75%	4.76%	14.90%	36.83%	27.07%	16.43%
2006	2.64%	1.21%	6.95%	33.84%	37.01%	21.00%	5.07%	13.80%	33.85%	27.64%	19.63%
2007	2.48%	3.42%	7.00%	41.21%	32.35%	16.02%	5.35%	12.08%	33.50%	27.13%	21.93%

Table 2: Recommendations released by affiliated and non affiliated brokers before MAD (Continued)

Panel B: By country											
Country	Prop. Aff.	Affiliated					Non-Affiliated				
		Strong Sell	Sell	Neutral	Buy	Strong Buy	Strong Sell	Sell	Neutral	Buy	Strong Buy
Austria	4.93%	0.00%	0.70%	41.96%	29.37%	27.97%	3.26%	9.79%	41.03%	25.73%	20.19%
Belgium	2.48%	0.00%	10.00%	38.95%	33.16%	17.89%	3.97%	12.22%	38.54%	26.96%	18.31%
Denmark	1.72%	2.26%	9.02%	28.57%	44.36%	15.79%	7.00%	17.81%	29.37%	29.53%	16.30%
Finland	1.59%	1.19%	11.31%	36.90%	29.76%	20.83%	5.16%	20.35%	26.92%	34.37%	13.20%
France	3.09%	0.88%	7.19%	31.40%	41.97%	18.56%	4.68%	15.22%	29.79%	30.42%	19.89%
Germany	2.43%	2.11%	6.12%	35.54%	35.14%	21.08%	6.42%	12.38%	39.40%	24.22%	17.58%
Ireland	2.11%	0.00%	4.88%	29.27%	34.15%	31.71%	1.58%	5.74%	31.28%	36.86%	24.54%
Italy	2.50%	1.77%	6.57%	39.65%	37.12%	14.90%	3.29%	11.73%	40.85%	28.99%	15.14%
Netherland	2.21%	2.54%	5.29%	34.04%	30.66%	27.48%	6.68%	11.20%	38.45%	24.37%	19.30%
Portugal	3.69%	1.99%	7.28%	33.77%	37.09%	19.87%	6.95%	14.33%	32.63%	28.12%	17.98%
Spain	2.53%	3.09%	6.19%	31.44%	32.22%	27.06%	7.17%	15.48%	30.92%	27.33%	19.10%
Sweden	1.79%	1.38%	12.80%	25.61%	43.60%	16.61%	5.90%	17.39%	30.29%	30.62%	15.80%
United Kingdom	1.84%	0.82%	3.56%	29.06%	37.83%	28.72%	4.98%	9.58%	36.68%	29.09%	19.67%

Table 3: The impact of MAD on conflicted equity research

This table presents results of regressions examining the impact of MAD on brokers' over-optimism (specification (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) *Affiliated* is a dummy variable that equals 1 if the issuing broker had investment banking business with recommended firm during the year preceding the recommendation. In columns (2) *Affiliated* is a dummy variable that equals 1 if the issuing broker had investment banking business with recommended firm between twelve to twenty-two month before the recommendation. In columns (3) *Affiliated* is a dummy variable that equals 1 if the issuing broker had investment banking business with recommended firm between twenty-four to thirty-six month before the recommendation. All the variables are defined in Appendix A. 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 γ_0 (coefficient on *Affiliated*) + γ_2 (coefficient on *Affiliated* × *MAD*) = 0.

	Brokers' Optimism		
	Baseline (1)	(1-2 years) (2)	(2-3 years) (3)
<i>Affiliated</i> (i)	0.179** [9.15]	0.122** [5.92]	0.052** [2.08]
<i>MAD</i>	-0.018 [1.08]	-0.020 [1.21]	-0.020 [1.16]
<i>Affiliated</i> × <i>MAD</i> (ii)	-0.148** [5.53]	-0.061 [1.71]	0.005 [0.13]
<i>Herding</i>	0.210** [19.39]	0.212** [20.02]	0.212** [20.04]
<i>CER</i>	-0.001 [0.09]	-0.001 [0.08]	-0.001 [0.08]
<i>Prior Firm return</i>	-0.020** [4.09]	-0.019** [4.01]	-0.019** [4.05]
<i>Prior Market return</i>	0.072** [3.20]	0.071** [3.14]	0.071** [3.15]
<i>log</i> (#Analysts)	0.012 [0.69]	0.009 [0.50]	0.008 [0.48]
<i>log</i> (# Firms covered)	-0.097** [3.06]	-0.097** [3.10]	-0.096** [3.07]
<i>Initiation</i>	0.040** [4.98]	0.041** [5.14]	0.041** [5.02]
Broker/Country/Year FE	Yes	Yes	Yes
#Obs.	268,199	262,009	258,703
R ²	0.04	0.04	0.04
<i>p</i> -value: (i) + (ii) = 0	0.14	0.04	0.13

Table 4: The impact of MAD on conflicted equity research – Robustness

This table presents results of regressions examining the impact of MAD on brokers' over-optimism (specification (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 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. All the variables are defined in Appendix A. The sample period spans from 1997 to 2007. In column (1), specification (1) is estimated with the Fama-MacBeth (1973) approach. In column (2), specification (1) is estimated with broker random effects. In column (3), we include firm fixed effects. Column (4) reports the results from an ordered probit estimation. In columns (5), (6), and (7), we exclude recommendations issued on U.K., French, and German stocks. In columns (8), (9), and (10), we only include recommendations issued on stocks that have market capitalization that are above the 50, 25, and 5 percentile of their country market capitalization distribution. 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 $Affiliated + Affiliated \times MAD = 0$

	Brokers' Optimism									
	F-M (1)	Broker RE (2)	Firm FE (3)	Probit (4)	No UK (5)	No France (6)	No Germany (7)	50% largest (8)	25% largest (9)	5% largest (10)
<i>Affiliated</i> (i)	0.169** [7.54]	0.179** [9.12]	0.202** [13.48]	0.354** [21.88]	0.165** [8.59]	0.189** [8.81]	0.177** [8.66]	0.212** [8.04]	0.214** [6.39]	0.231** [4.40]
<i>MAD</i>	-0.023 [0.98]	-0.02 [1.19]	-0.052** [4.44]	0.024 [1.84]	-0.006 [0.28]	-0.018 [0.99]	-0.011 [0.63]	-0.033 [1.54]	-0.062 [1.95]	0.001 [0.01]
<i>Affiliated</i> × <i>MAD</i> (ii)	-0.138** [4.67] [5.02]	-0.148** [5.53] [4.99]	-0.142** [5.28] [9.34]	-0.199** [6.52] [28.98]	-0.167** [5.18] [4.57]	-0.145** [5.37] [5.62]	-0.133** [4.20] [4.27]	-0.156** [5.10] [1.46]	-0.158** [3.87] [0.68]	-0.145* [2.10] [0.11]
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Broker FE	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
#Obs.	268,199	268,199	268,199	268,199	188,717	224,113	227,179	134,101	67,045	13,418
R ²	0.04	0.02	0.02	0.02	0.04	0.04	0.04	0.06	0.07	0.1
p-value: (i) + (ii) = 0	0.11	0.14	0.00	0.01	0.93	0.05	0.07	0.02	0.10	0.18

Table 5: The impact of MAD on conflicted equity research – Confounding effects of U.S. regulations?

This table presents results of regressions examining whether the impact of MAD on brokers' over-optimism (specification (1)) can be attributed to the global reach of U.S. regulations. 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. *US* is a dummy variable that equals 1 after the enactment of RegFD or SOX in the U.S and 0 before. *MAD* is a dummy variable that equals 1 after the transposition of MAD into national laws and 0 before. To preserve space, we do not report the coefficient of the control variables (whose definition can be found in Appendix A). The sample period spans from 1997 to 2007. In columns (3) and (4), we only include recommendation issued by brokers having U.S. and European operations. In columns (5) and (6), we only include recommendation issued by U.S. brokers. In columns (7) and (8), we only include recommendation issued by brokers involved in the U.S Global Research Settlement of 2002. 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.

	Brokers' Optimism							
	All brokers		Global brokers		US Brokers		Global Settlement	
	RegFD (1)	SOX (2)	RegFD (3)	SOX (4)	RegFD (5)	SOX (6)	RegFD (7)	SOX (8)
<i>Affiliated</i>	0.167** [6.75]	0.191** [8.77]	0.162** [6.48]	0.186** [8.10]	0.146** [3.78]	0.168** [4.68]	0.136** [8.21]	0.182** [8.51]
<i>US</i>	0.054 [1.28]	-0.098** [3.40]	0.078 [1.41]	-0.105** [3.07]	-0.004 [0.06]	-0.122 [1.06]	0.001 [0.02]	-0.186* [2.58]
<i>Affiliated</i> × <i>US</i>	0.020 [0.64]	-0.037 [1.34]	0.04 [1.30]	0.001 [0.02]	0.067 [1.91]	0.061 [1.60]	0.090* [2.63]	0.047 [1.29]
<i>US</i> × <i>MAD</i>	-0.018 [1.08]	-0.019 [1.11]	-0.029 [1.44]	-0.028 [1.44]	-0.007 [0.21]	-0.006 [0.19]	-0.017 [0.54]	-0.016 [0.52]
<i>Affiliated</i> × <i>US</i> × <i>MAD</i>	-0.156** [5.48]	-0.123** [3.93]	-0.160** [5.21]	-0.145** [4.24]	-0.194** [5.20]	-0.210** [4.52]	-0.165** [3.80]	-0.168** [3.10]
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Broker/Country/Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
#Obs.	268,199	268,199	163,770	163,770	34,345	34,345	46,570	46,570
R ²	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04

Table 6: The impact of MAD on conflicted equity research – Sanctions and Enforcement

This table presents results of regressions examining whether the impact of MAD on brokers' over-optimism (specification (1)) depends on sanctions and 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 *Sanctions*, *Staff*, and *Budget*. 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 specification (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 Appendix A). The sample period spans from 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.

	Brokers' Optimism								
	Sanctions			Staff per mio. population			Budget per bn. \$GDP		
	Weak (1)	Strong (2)	W-S (<i>p.val</i>)	Weak (3)	Strong (4)	W-S (<i>p.val</i>)	Weak (5)	Strong (6)	W-S (<i>p.val</i>)
<i>Affiliated</i> (i)	0.177** [10.16]	0.182** [8.36]	0.81	0.204** [10.04]	0.162** [8.86]	0.07* [1.57]	0.214** [10.60]	0.155** [8.41]	0.01** [0.01]
<i>MAD</i>	-0.045** [2.98]	-0.062** [3.60]	0.44	-0.026 [1.69]	-0.065** [4.05]	0.07* [1.57]	-0.024 [1.57]	-0.066** [4.18]	0.05** [0.01]
<i>Affiliated</i> × <i>MAD</i> (ii)	-0.115** [3.51]	-0.178** [4.41]	0.16	-0.115** [2.94]	-0.161** [4.72]	0.28	-0.130** [3.49]	-0.160** [4.48]	0.50
Control Variables	Yes	Yes		Yes	Yes		Yes	Yes	
Broker/Country/Year FE	Yes	Yes		Yes	Yes		Yes	Yes	
#Obs.	156,672	111,527		132,892	135,307		133,350	134,849	
R ²	0.02	0.02		0.02	0.02		0.02	0.02	
W(i) + W(ii) = S(i) + S(ii) (<i>p.val</i>)		0.11			0.01**			0.01**	