Financial market enforcement in France

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Abstract

This article puts into perspective enforcement as conducted by the French Financial Market Authority since its creation in 2003 until 2021 with respect to the current state of the literature on financial crimes. The three main channels of action are exhaustively surveyed: sanctions, settlements (since 2012), and alerts (since 2010). The sample is comprised of 393 sanctions standing for cumulated 371 million euros of fines, of 86 settlements standing for cumulated 13 million euros of fines, and of 194 alerts. The article also underlines the complex challenges of information acquisition regarding financial crimes, despite increased efforts of enforcers in terms of transparency. Financial innovations and internationalization of financial markets also contribute to challenge enforcement. This review is supplemented by investigating the translation of regulatory changes into the verdicts for breaking the law, measured as the fines. The results stress that the majority of legal criteria introduced in 2016 were already accounted for, with room for improvement for enforcers and defendants. The ultimate goal of this article is to fuel regulatory debates on how to enforce financial regulations more efficiently in light of the recent history, in a European and globalized context.

Keywords Financial crime · White-collar crime · Regulation · Enforcement · Financial markets · Information and market efficiency

JEL Classification G18 · G28 · G38 · K23 · K41 · K42

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1 Introduction

Adding to recent in-depth reviews by Amiram et al. (2018), Reurink (2018), and Liu and Yawson (2020), this article documents the interconnexions between enforcement and financial crimes, when market participants deliberately mislead investors. It is a retrospective analysis of a nearly two-decade-long history of administrative decisions made by the French Financial Market Authority (AMF).[1] The ultimate goal is to fuel regulatory debates on how to enforce financial regulations more efficiently to deter financial crimes and attract investors (Jackson & Roe, 2009; La Porta et al., 2006). This subject is important because, among all corporate crimes, financial crimes trigger the strongest market reactions and subsequently impact corporate reputations severely (Engelen, 2011; Haslem et al., 2017; Karpoff, 2012, 2020). Amiram et al. (2018) also stress that financial crimes threaten the existence and efficiency of capital markets, which are based on trust from market participants (investors, stakeholders, financial analysts, etc.), as notoriously illustrated in 2020 by the collapse of the former star of the German DAX, Wirecard, due to a massive accounting fraud.

In line with the academic, practitioner, and policy literature, we define financial crimes as (1) the three market abuses, (2) breaches of professional obligations, and marginally (3) obstruction to the exercise of enforcers' mandate and missions, incriminated respectively in 56%, 53%, and 4% of the AMF sanctions (see Table 1). Deemed more serious, the market abuses are comprised of (1) breaches of insider dealing regulations (28% of sanctions)—the divulgence and/or use of insider information for investment decisions, including frontrunning client orders, (2) price manipulations (10% of sanctions)—a deliberate misconduct to influence securities prices and fair price formation,[2] and (3) breaches of public disclosure requirements (33% of sanctions)—a failure to comply with financial reporting laws and regulations.[3]

This article is unique in that it provides an exhaustive retrospective of sanction and settlement decisions published by the AMF from its creation in 2003 (from the merger of three public bodies) until late 2021, and addresses the whole process from the violation period to the verdict and possible subsequent appeals. The scope of the article also includes the alerts, a direct channel of communication with market participants introduced by the AMF in 2010 to stress the riskiness of market participants or market misconducts. The exhaustivity was permitted by the fact that the AMF shared confidential regulatory information to complete a dataset, otherwise

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[1] https://www.amf-france.org/fr.

[2] For example: end-of-day manipulation, matched orders, circular trading, reference price influence, improper order handling (churning, wash trades, spoofing), and boiler-room operation.

[3] Failures to comply with financial reporting laws and regulations are most frequently misstatements on financial reports of listed firms, in violation of generally accepted accounting principles (GAAP), with the objective of making others act in detriment to their best interests. Karpoff and Lott (1993) stress a key difference between accounting frauds and other violations of securities laws: the direct balance sheet consequences of accounting restatements.

Table 1 Financial breaches in the enforcement scope of the AMF

	Definition	Text	Sanctions	Settlements	Share of sanctions* (%)
1. Market abuses					56.5
(1) Insider trading	When an insider recommends (or encourages) to carry out an operation based on a financial instrument related to (or based on) the insider information;	Mon. Fin. Code L. 465-1, I-B	Yes	Yes (since 2016)	27.7
	When a person knowingly uses this recommendation or incentive (i.e. acknowledging that this information is based on insider information);				
	When a person knowingly shares this recommendation or incentive				
(2) Price manipulation	When a person carries out an operation, places an order, or behaves in a way that gives or is likely to give false or misleading signals on the supply, demand or price of financial instruments or that fixes or is likely to fix the price of a financial instrument at an abnormal or artificial level	Mon. Fin. Code L 465-3-1, I	Yes	Yes (since 2016)	9.7
(3) Dissemination of false information	When a person has information (whatever the medium) likely to give false or misleading indications on the health, the perspectives of an issuer or on the demand, supply or price of a financial instrument (in particular breaches to financial reporting)	Mon. Fin. Code L465-3-2	Yes	Yes (since 2016)	32.8

Table 1 (continued)

Definition	Text	Sanctions	Settlements	Share of sanctions* (%)
2. Breaches of professional obligations	Rulebook of the AMF	Yes	Yes (since 2012)	53.4
Regulated professionals, natural persons acting under the authority of regulated professionals, any breach undermining investor protection or well-functioning financial markets, or any other breach to the obligations relative to anti-money laundering and countering the financing of terrorism				
Examples: failures in internal controls; management of conflicts of interest; failure to defend the primacy of the shareholders; shortages in management of reglementary solvency ratios				
3. Obstruction to the exercise of AMF controllers' or investigators' mandate and missions—*Until Constitutional Council decision n°2021-965 QPC (SAN-2019-15)*	Mon. Fin. code L.621-15, II-F	Yes (before 2022)	Yes (before 2022)	3.8
(1) Refusal to give access to a document, whatever the medium, and to give a copy to it				
(2) Refusal to share information or to answer a convocation				
(3) Refusal to give access to business premises				

The table details the scope of financial crimes sanctioned or settled by the AMF, according to the two rulebooks it is subjected to as an independent public authority: the Monetary and Financial Code and the Rulebook of the AMF. Table 1 also highlights regulatory changes and the share of sanctions falling into each category. Finally, Table 1 displays the share of each financial crime in the published sanctions over the 2004–2021 period

Sources: AMF, Author

*The total exceeds 100%. On average, 1.3 breaches are sanctioned per decision

based on publicly available information.[4] Regulatory information covered specifically the identity of the parties at stake, when anonymized, and some dates of the enforcement procedures, when not included in the published reports. Exhaustively investigating enforcement decisions is a way to circumvent the partial observability of fraud. Consequently, this article escapes, by construction, some challenges stressed by Karpoff et al. (2017) regarding the data quality and confidentiality: no omitted cases, no unintentional frauds, no alleged frauds, and no duplicates.

Our contributions to the literature can be summarized in the following points. First, it is of considerable interest to enrich the knowledge on financial crimes from the perspective of a relatively overlooked, significant, and civil law European country over the long term, as the existing literature focusses chiefly on the United States (U.S.) with a common law (de Batz & Kočenda, 2020). Common laws would put more emphasis on private contracting and standardized disclosure, and would also rely on private dispute resolution using market-friendly standards of liability. Additionally, French takeaways might be insightful to other European countries given the current top-down legal procedure, with European Directives and Regulations transposed in the member States laws, and also to other jurisdictions which imported the French legal and regulatory regime (see Tables 2 and 3). A second contribution of this article is to highlight general trends along two decades beyond exceptional stories, which hit the headlines of the financial and economic press and might distort perceptions. As stressed in Karpoff and Lott (1999; p. 528) for the U.S., "anecdotes about a few exceptionally large awards do not necessarily imply that firms in general expect large losses when cases are filed against them. Nor do they indicate that punitive damages impose large losses on the market as a whole". Third, these developments on financial crimes are not meant to be comprehensive and encyclopedic: general trends and a selection of enforcement actions by the AMF are put into perspective with respect to academic research. All parties at stake in sanction decisions are anonymized not to breach confidentiality, and systematically referred to the sanction decision number (SAN-year-number), as published on the AMF webpage.[5] Fourth, this article lists challenges to enforcement and deterrence of financial crimes for market participants (for example compliance and risk departments) and for regulators. Finally, the article questions whether regulatory changes influenced enforcement over time, given that verdicts are meant to be time-consistent and proportional to the seriousness of the breach(es). More specifically, we conduct econometric estimations to model fines based on the seven criteria to be accounted for when setting fines introduced by law in 2016. The results demonstrate that part of those criteria was neglected on a historical basis. Echoing the signaling theory (Spence, 2002), such criteria are levers for defendant(s) to limit the fines they face (cooperation and remedial measures). They could also help the Enforcement Committee better assess

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[4] Most of the information was collected from the AMF website (https://www.amf-france.org/en). In particular, sanctions, settlements, and alerts are extensively published on this site though (partly) anonymized (52% of the online sanction reports are anonymized to some extent). The decisions were individually analyzed to build the dataset.

[5] By searching on any search engine or directly of the AMF webpage (https://www.amf-france.org/en), one can access the whole sanction decision.

Table 2 Enforcement in France Versus Other Jurisdictions

	France	Germany	U.K	U.S	China
Securities regulator	Autorité des Marchés Financiers (AMF)	Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin)	Financial Conduct Authority (FCA, FSA until 2012)	Securities and Exchange Commission (SEC)	China Securities Regulatory Commission (CSRC)
Scope limited to Securities and Exchange markets	Yes	No	Yes	Yes	Yes
Civil actions can be taken by the securities regulator	Yes	Yes	Yes	Yes	No
Major types of sanction	Warning, blame, prohibition and suspension from activity, financial penalties	Threat of financial penalties, administrative or coercive financial penalties (Federal Office of Justice can impose disciplinary fine)	Variation/cancellation/refusal of authorization/approval/permissions, financial penalties, public censure, prohibition and suspension	Cease and desist orders, suspension or revocation of broker-dealer and investment advisor registrations, censures, bars from association with the securities industry, monetary penalties and disgorgements	Warning, fines, disgorgement of illegal gains, banning of market entry, rectification notice, regulatory concern and letter of warning, public statements and regulatory interview
Most frequent type of sanction	Financial penalties	Financial penalties	Financial penalties	Financial penalties	Non-financial penalties
Possibility of class actions	No	No (*Kapitalanleger-Musterverfahrensgesetz*)	No	Yes	Yes
Regulatory communication before sanction	No	Yes (threats)	Yes (warning notices)	Yes	No
Settlements	Yes (since 2012)	Yes (since 2019)	Yes	Yes	Yes (mediations)
Type of law	Code	Code	Common	Common	Code

Table 2 (continued)

	France	Germany	U.K	U.S	China
Characteristics of enforcement	(1) State-employed judges	(1) State-employed judges	(1) Independent judges and juries	(1) Independent judges and juries	(1) State-employed judges
	(2) Preference for legal and procedural codes	(2) Preference for legal and procedural codes	(2) Lower importance given to statutory laws	(2) Lower importance given to statutory laws	(2) Preference for legal and procedural codes
	(3) Preference given to State regulation over private litigation	(3) Preference given to State regulation over private litigation	(3) Preference for private litigation as a mean of addressing social problems	(3) Preference for private litigation as a mean of addressing social problems	(3) Preference given to State regulation over private litigation
Legal origins*	French, Roman	German, Roman	English	English	German, Socialist
Stylized facts (2021)					
Headcounts (full-time equivalent, as number)	486	2786	3903	4459	3278**
Operating expenses (in million euros)	117.3	436.5	696.6	2162.3	NA (funded by the Ministry of Finance)
Number of sanctions	18	36	10	697	344*
Cumulated cash fines (in million euros)	61.1	22.3	675.7	3405.2	NA
Average fine (in million euros)	3.4	0.6	67.6	4.9	NA

The table compares the main features of securities law enforcement in France with four other main countries: Germany, the U.K., the U.S., and China. Each country has its own enforcement mix, reflecting its legal origin and type of law. Finally, the table compares the enforcement activity of those five countries with up to date data

Sources: Annual Reports, Author. Rem: Exchange rates on 31/12/2021

*La Porta et al. (2008), **2020

Table 3 Legal framework of the AMF and consequences on enforcement

Years	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AMF chairmen	Michel Prada (23/11/2003 to 15/12/2008)					Jean-Pierre Jouyet (15/12/2008 to 18/07/2012)				*	Gérard Rameix (01/08/2012 to 01/08/2017)				Robert Ophèle (01/08/2017 to 31/07/2022)					* *
Enforcement committee Chairmen	Jacques Ribs (27/11/2003 to 28/05/2006)			Daniel Labetoulle (29/05/2006 to 31/05/2011)					Claude Nocquet (01/06/2011 to 08/01/2014)			Michel Pinault (09/01/2014 to 12/04/2016)		Marie-Hélène Tric (13/04/2016 to 08/09/2021)					Jean Gaeremynck (09/09/2021)	
Enforcement committees Chaimen	Jacques Ribs			Claude Nocquet		Daniel Labetoulle	Jean-Claude Hassan				Michel Pinault	Marie-Hélène Tric	C. Soulard	Jean Gaeremynck			D. Guérin			
European Directives and Regulations**	MiFID MAD Prospectus AIFMD	Transparency	AML/CTF	AML/CTF					AIFMD AML/CTF EMIR Short selling	AML/CTF Transpa rency***	MIF2 MAR		Benchmark			AML/CTF	EMIR-Refit	Taxonomy		
French laws impacting the AMF	Loi de Sécurité Financière (LSF) n°2003-706 (01/08/2003)					Loi de Modernisation de l'Economie (LME) n°2008-776 (04/08/2008)		Loi de Régulation Bancaire et Financière (LRBF) n°2010-1249 (22/10/2010)					1) Loi réformant le système de répression des abus de marché n°2016-819 of (21/06/2016) 2) Loi relative à la transparence, à la lutte contre la corruption et à la modernisation de la vie économique n°2016-1691 (IV Art. 42-46) (09/12/2016)				1) Plan d'Action pour la Croissance et la Transformation des Entreprises (PACTE) n°2019-486 (22/05/2019) 2) Article L. 621-15 F.II Monetary and Financial Code, following Constitutional Council decision n°2021-965 QPC on obstruction				

Main subsequent impacts of the reforms on enforcement by the AMF (2003)	Main subsequent impacts (2008)	Main subsequent impacts (2010)	Main subsequent impacts (2016)	Main subsequent impacts (2019)
- Merger of three bodies: 1) *Commission des Opérations de Bourses* (COB), created in 1967 and sanctioning since 1989 (*Loi sur la sécurité et la transparence des marchés financiers*) 2) *Conseil des marchés financiers* (CMF) 3) *Conseil de discipline de la gestion financière* (CDGF) - Separation of the office of prosecution (by the AMF, under the supervision of the Chairman of the AMF) and judgment functions (by the Enforcement Committee)	- Increase in the upper limit of pecuniary sanctions: from 1.5mn to 10mn EUR of the upper ceiling of pecuniary sanctions, or 10 times the profits gained from the infringement or the losses avoided - Defendants allowed to objecting to a member of the enforcement committee (Article R621-39-2 Monetary and Financial Code)	- Increase in the upper limit of pecuniary sanctions: from 10mn to 100mns EUR for breaches committed by legal persons (or 10 times the profits gained in such cases, or 15% of annual turnover) and from 1.5mn à 15mns EUR for market abuses committed by natural persons (or 10 times the profits gained in such cases) - Publicity on the Enforcement Committee hearings (with some exception) and on the sanction decisions - A member of the Board represented in front of Enforcement Committee - New anonymization rules - Introduction of follow-up letters sent at the end of the procedure - Introduction of the possible recourse of the AMF Chairman against decisions made by the Enforcement Committe, subjected to the Board approval - Creation of settlement (first signed in 2012). Perimeter limited to breaches to professional obligations committed by providers and financial intermediaries, including financial investment advisers and sales (excl. market abuses)	1.1) Non bis in idem: referral process between the AMF and the National Financial Prosecutor (possible arbitrage by Paris Attorney General) 1.2) Enlarged settlements scope to market abuses 1.3) Harmonized definitions of market abuses (European guidelines) 2.1) Tightening of the rules to set pecuniary sanctions*⁴ and of behavioral sanctions*⁵ 2.2) Five additional criteria to set sanctions*⁶ 2.3) Enlarged sanctions scope to irregular takeover bids 2.4) Extension of the offence of obstruction to controls 2.5) Ex post anonymization of sanctions on natural persons*⁷	1.1) Withdrawal of the participation of the representative of the director general of the Treasury during the Enforcement Committee hearings 1.2) Alignment between administrative and criminal prosecutions: 3 to 6 years for the AMF 1.3) Enlarged scope of operators subject to legal injction to block access to their websites (AMF chairman's initiative) 1.4) Registration obligation for crypto-asset service providers 2) Repeal of the right to sanction anyone whose behavior constitutes an obstruction to the conduct of AMF inquiries/controls

The table depicts the main parameters of enforcement by the AMF since its creation in 2003: the chairmen of the AMF, named by Presidential decree for a 5-year nonrenewable mandate, the chairmen of the Enforcement Committee, the European Directives and Regulations which were transposed into the French financial laws, the six French laws, and how these laws reformed and enlarged the AMF scope of enforcement and sanction powers

Source: Author

*Acting chairmen: Jean Delmas-Marsalet substituted for Jean-Pierre Jouyet for less than a month in 2012, after he left for political reasons until Gérard Rameix was named by Presidential decree. Similarly, Jean-Claude Hassan chaired the AMF between July and October 2022, when Marie-Anne Barbat-Layani was named

**European Directives and Regulations, sorted by chronological order: MiFID: Markets in Financial Instruments Dir. 2004/39/EC; MAD: Market Abuse Dir. 2003/124/EC; Dir. Prospectus 2003/71/EC; AIFMD: Alternative Investment Fund Managers Dir. 2003/41/EC; Dir. Transparency 2004/109/EC; AML/CTF: Dir. Anti-Money Laundering/Combating Terrorist Financing 2005/60/EC; AML/CTF: Dir. Anti-Money Laundering/Combating Terrorist Financing 2006/70/EC; AIFMD: Alternative Investment Fund Managers Dir. 2011/61/UE; AML/CTF: Reg. on Anti-Money Laundering/Combating Terrorist Financing 648/2012; EMIR: European Market Infrastructure Reg. 648/2012; Short selling Reg. 236/2012/EU; Revised Transparency Dir. 2013/50/EU; MIF2: Dir. Markets in Financial Instruments 2014/65/EU; MAR: Market Abuse Reg. 596/2014; Benchmark Reg. 2016/1011; AML-CTF: Dir. on Anti-Money Laundering/Combating Terrorist Financing 2018/843; EMIR-Refit Reg. 2019/834; Reg. taxonomy 2020/852/EU

***Minimum sanctions applicable in cases of non-compliance with provisions of the directive with, in particular, significant civil financial penalties and a quasi-systematic publication of sanctions on a non-anonymous basis

Table 3 (continued)

[iv]*Pecuniary sanctions at least three times the amount of the profits gained from the infringement or the losses avoided, if such amounts can be determined. If the profits or losses cannot be determined, natural persons found guilty of market abuse must be assessed sanctions of at least 5mns EUR and legal persons, at least 15mns EUR or 15% of their total annual turnover

[v]*Enlarged bans on persons (permanent or temporary): discharging managerial responsibilities within an investment firm or another natural person who is held responsible for the infringement, from dealing on their own account or performing management functions in an investment firm; permanent ban from exercising management functions in investment firms in the event of repeated market abuse

[vi]*Newly introduced criteria: (1) Quality and degree of involvement of the person(s) involved; (2) financial situation of the defendant; (3) losses suffered by third parties as a result of the breach(es); (4) degree of cooperation along the procedure; (5) recidivism and remedial changes implemented

Already included: seriousness and duration of the breach(es); magnitude of the obtained gains or advantages (or avoided losses)

[vii]*Lift of definitive ban from activity after 10 years and of identity of sanctioned natural persons from the AMF website after 5 years

and account for the severity of breach(es) (duration of the breach(es), role of the management of the firm, and victims of the breach(es)). Complementary analyses could contribute to better understand financial crimes, their detection and spillovers, and to the design of efficient financial regulations and reinforce the effectiveness of supervision and enforcement.

The rest of the article is organized as follows. As a first step in challenging enforcement of financial regulations, Sect. 2 summarizes major characteristics of financial crimes as documented in the cross-disciplinary literature for decades. This sets the basis for two sections that examine the parties at stake and financial crimes punishment from a French perspective. The fifth section broadens the perspective by stressing key challenges for enforcement and deterrence of financial crimes. The sixth section questions the translation of regulatory changes into the verdicts of sanctions. Finally, the last section concludes this retrospective.

2 Characteristics of financial crimes and enforcement

2.1 Financial crimes: a specific white-collar crime

Generally speaking, Edelhertz (1970; p. 3) defines white-collar crimes as "illegal act(s) or series of illegal acts committed by non-physical means and by concealment or guile, to obtain money or property, to avoid the payment or loss of money or property, or to obtain business or personal advantage". Such crimes cover diverse misdeeds, ranging from fraud and manipulation to theft, corruption and financial crimes, as stressed by Gottschalk (2010). Three prerequisites can lead to a white-collar crime, according to Cressey (1950, 1953): (1) a private non-sharable financial problem; (2) contextual opportunities to commit fraud, which would allow the perpetrator to commit the fraud and escape detection; (3) the ability to justify to oneself that the fraudulent actions are not necessarily wrong. Typically, financial crimes can be motivated by the pressure to meet financial targets, the dishonesty of

the management, or the search to maximize personal gain (for example, to protect bonuses or stock option schemes). Acting legally can also become an economic disadvantage for a firm and/or its management (Aupperle et al., 1985; Hawley, 1991), for example when the costs for abiding the law become an economic disadvantage or when competitors/peers do not abide the law. Put it differently, in line with Becker's (1968) model of crime,[6] the expected costs of being sanctioned (fines, litigation costs, reputational penalties, impact on clients and suppliers, HR consequences, etc.) can be lower than the benefits of cheating on the law (higher returns on assets, lower costs of doing business, etc.), for a given probability of being caught.

Financial crimes cannot be observed directly and are difficult to detect and sanction. Direct evidence of the crime is rare, and investigations typically rely in circumstantial evidence and draw reasonable inferences. Consequently, only a limited share of those crimes is detected (so-called "partial observability"), with an unknown and low probability. For example, Alawadhi et al. (2020) estimate that only 3.5% of financial mis-presentations are eventually caught and sanctioned in the U.S.

Overcoming partial observability is critical to investors, enforcers, and auditing firms, though auditors can be reluctant to use fraud prediction models in practice due to litigation concerns (Beneish & Vorst, 2021). Better detecting financial crimes implies a minimization of false positives and false negatives. Some researchers attempted to measure the probability of detection and the prevalence of unobserved fraud, in the vein of the control detection methods initiated by Poirier (1980) and of natural experiments, such as the spillovers on fraud detection of the changes of auditors subsequent to the failure of Arthur Andersen (Dyck et al., 2013). A growing literature proposes methodological advances to detect and predict financial crimes, for example using alternative predictors (non-financial indicators in Brazel et al. (2009)), measuring financial statement divergence based on how the distribution of first digits differs from Benford's Law (Amiram et al., 2015; Chakraborty et al., 2020), implementing machine learning models to detect fraud or to classify firms (the financial kernel model of Cecchini et al. (2010) and the machine-learning model in Bao et al. (2020)), or using artificial intelligence, for example to analyze firms communication (Hoberg & Lewis, 2017; Hobson et al., 2012). A particularly interesting venue to proxy the prevalence of financial crimes is the application of capture-recapture methods such as Ashton et al. (2021) on United Kingdom (U.K.) data, capitalizing on Ormosi (2014) for cartels, or Rossmo an Routledge (1990) for prostitution. Consequently, Amiram et al., (2018; p. 738) conclude that "our knowledge of financial misconduct comes almost exclusively from firms that were caught, and the characteristics of those firms may differ from firms that commit fraud without detection."

When detected, white-collar crimes can lead to major corrective actions, and even bankruptcy in some cases: changes in the financing mix due to higher costs of doing

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[6] Becker (1968) models the choice to engage in misbehavior like any other decision involving cost-benefit tradeoffs, in light of the expected profits from fraud, the probability of being caught, and the subsequent sanction.

business, changes in the top management, impact on remunerations and teams' commitment, corporate rating downgrades, replacement of auditing firms, etc.[7]

2.2 What are the goals of enforcement? Why sanctioning financial crimes?

Securities markets are regulated so that investors, from large institutional to retail investors, have access to quality information prior to and after any investment (Black, 2000). This arrangement sets the base for investors' trust. Trust is formed by the *ex-ante* belief that one's counterpart will suffer consequences for opportunistic or fraudulent behavior (Dupont and Karpoff, 2020). Enforcement also aims to provide incentives for market participants' compliance with the law, by detecting breaches, sanctioning violators, and setting example. Violation of securities laws can have severe consequences, as it is one of the six possible causes of corporate failures (Soltani, 2014). In that sense, the legal system is fundamental to investors' protection (La Porta et al., 2006) by impacting two pillars of Becker's (1968) model: the intensity of enforcement will raise the probability of being caught and the expected subsequent costs. Hence, enforcement contributes to deter future crimes and to set example, but is constrained by the problem of partial observability (Ashton et al., 2021).

Enforcement is always country-specific, resulting from history. Each country has a specific enforcement mix, with different weights given to public (higher in civil law countries like France) or private (conversely higher in common law countries like the U.S.) enforcement, and at the extreme to self-regulation of the markets (Djankov et al., 2008) through reputational sanctions to discipline markets—leading to disorder—or nationalization of all security issuance—leading to dictatorship (Shleifer, 2005). Another dimension adding complexity is the country-specific mix of hard and soft financial laws (Choudhury, 2018). This dimension is particularly relevant to European countries, which national legislative process evolves closely in line with global and European soft laws. Hard laws imply (1) legally binding obligations, (2) precision, and (3) delegation of authority for interpreting and implementing the law, according to Abbott and Snidal (2000). Conversely, soft laws relax at least one of those three dimensions leading to non-binding principles, norms, standards and statements. Soft laws can be a rational way of facilitating international cooperation, as they offer cheaper guidelines (when it would be politically costly to reach an agreement between States, or when the future consequences for the parties at stake are uncertain) in a continuously evolving and globalized financial markets (Abbott & Snidal, 2000).

A long-lived academic debate—at the intersection between accounting, finance, law, and economics—investigates the respective costs and benefits of public *versus* private enforcement, with proponents on both sides. Both enforcement styles

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[7] For example, the U.S. SEC enforced in October 2022 the clawback requirements of the 2010 Dodd-Franck Act. Consequently, all issuers are required to recover amounts of incentive compensation from current and former executives that were based on erroneously reported financial information, regardless of whether the executive was at fault or not.

could be more supportive of efficient and well-functioning financial markets.[8] Public enforcement, motivated by the "public interest" rather than by the pursue of their own interests (McCraw, 1975), is supported by the existence of externalities, by economy-wide cost savings, by allegedly public-regarding and expert-in-their-domains policymakers, by the possibility to cooperate with defendants (Choi & Pritchard, 2016), and by criminal, financial, and reputational penalties that deter wrongdoings. But public enforcement is degraded by the difficulties of implementation of securities regulations. Public enforcers have mixed-to-low incentives (Scholz, 1984): resource constraints, difficult access to information, low competences compared to the industry, corruption and collusion with the industry, and political pressure (McCraw, 1975).[9] Conversely, private enforcement actions could be brought by well-informed actors with well-aligned incentives. But, in parallel, private enforcement is subject to collective action and free-rider effects among dispersed investors, to slow and inept judiciaries, to lawyers' rent-seeking (costly litigation for investors, commitment problems), to less information than enforcers (Choi & Pritchard, 2016), and to insufficient private monetary penalties.

Financial regulations can be enforced either by one single financial supervisory agency (such as a securities and exchange commission or a central bank), or by several bodies for example at the federal, province, or state levels, or depending on the sector with splits between banks, insurance companies, auditing or asset management firms, etc. As stressed by Coffee (2007), enforcement can also rely more on *ex ante* informal discussions and administrative guidance (such as in France, the U.K., and Japan), or on *ex post* formal legal actions against wrongdoers (in common law countries, like in the U.S.). Additionally, enforcement standards evolve over time. All in all, Shleifer (2005) summarizes three main legal French specificities, as opposed to common law countries: (1) a civil law country, where judges are State-employed; (2) a relatively greater importance given to legal and procedural codes; and (3) preference given to State regulation over private litigation.[10] Table 2 illustrates the significant differences in enforcement of financial regulations between France to four other countries (China, Germany, U.K., and U.S. by alphabetical order), including between European countries.

2.3 Costs of financial crimes

Shareholders' wealth can be harmed by the misconduct itself (Murphy et al., 2009), over the violation period, for example when top managers share and/or use insider information at their expense or publish forged financial statements (see Fig. 1). If the

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[8] Public enforcement is supported by Jackson and Roe (2009) and Johnston and Petacchi (2017) amid others, and private enforcement by Becker and Stigler (1974), La Porta et al. (2006), Djankov et al. (2008), and Bai et al. (2010).

[9] This challenge is much more salient in the U.S. where "the largest financial firms enjoy an unprecedented degree of political protection because of political contributions", as stressed in Mayer et al. (2014).

[10] Conversely, common law countries are characterized by independent judges and juries, a relatively lower importance given to statutory laws and a preference for private litigation as a mean of addressing social problems.
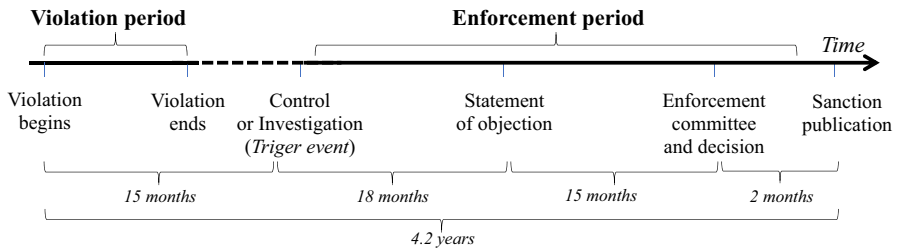
Fig. 1 Average timeline of enforcement procedures. The figure shows the typical succession of events from the violation period until the enforcement procedure, ending with a verdict. The lengths are averages, when the dates were included in the sanction reports or shared by the AMF. In 39% of the cases, the violation period overlaps the enforcement period for example when a control detected breaches of professional obligations which were not yet addressed. *Source*: Author

misconduct is detected and sanctioned, regulatory fines and compensations will add up as part of the direct costs of fraud, together with the legal fees along years-long procedures (Dechow et al., 1996; Palmrose et al., 2004) and the subsequent adjustments (for example a negative impact on profits of an accounting restatement). Indirect costs may also penalize investors (Gatzert, 2015; Zeidan, 2013) due to lower cash-flow expectations (with respect to clients), and higher costs of doing business (with respect to suppliers, business partners, human resource management) and of capital (*e.g.* downgraded forecasts, risk premia, rating, higher funding costs). The cumulated cost of indirect spillovers is commonly called "reputational penalty", as described by Engelen and van Essen (2011). This reputational penalty can be proxied by deducting direct costs from the abnormal market reactions subsequent to the publication of the financial crime, typically estimated using an event study methodology after Karpoff and Lott (1993). It reflects revised expectations of investors regarding future cash flows. The reputational penalty would by far exceed the direct costs in Anglo-Saxon countries (Armour et al., 2017; Karpoff et al., 2008), but not in France (de Batz, 2020a). In that sense, financial markets represent an enforcement channel inducing companies to abide financial regulations (Engelen, 2011), contrary to foreign bribery or environmental violations (Karpoff, 2012, 2020).

2.4 Parties at stake in financial crimes

White-collar crimes are committed by individuals, managers, or employees. Still, the firms (typically listed or private firms, asset management or investment firms, and auditing firms) are frequently held responsible, rather than (or together with) the managers or employees (Choi & Pritchard, 2016) or with more lenient verdicts (Gadinis, 2012). When the top management of a firm (or some of its employees) cheated on investors by sharing or using insider information, was unable to comply with its professional obligations, or manipulated share prices, shareholders are legitimate to question the professionalism and business ethics of the firm, its managers

and employees. This justifies a reputational penalty, possibly in excess to legal penalties (Karpoff & Lott, 1993).

Additionally, different parties can be hit by second round effects of financial crimes: related parties to the offender (investors, employees, customers, suppliers), or third parties (market participants, the public, etc.). This field of the literature concurs in a significantly higher reputational cost of wrongdoings against related parties than against third parties (for the U.S.: Alexander, 1999; Karpoff et al., 2008; Murphy et al., 2009; Tibbs et al., 2011; for the U.K.: Armour et al., 2017; for France: de Batz, 2020a).

Finally, financial crimes can be committed at the expense of other firms (so-called "victims" in the rest of the article), typically when a person manipulates others' stock prices, uses insider information against the victim, or divulgates false information on the victim. Victims' reputation might have also been damaged subsequently to the sanction of their offender (de Batz, 2020b).

3 Detection channels of financial crimes in France

In the section, we thrive to investigate which parties contribute to detect financial crimes, how to improve the detection mechanisms and hence to reduce the partial observability of crimes, based on takeaways from a French retrospective. Detailed statistics on supervision and enforcement by the AMF are displayed in Table 4.

3.1 Central role of the AMF: market surveillance and supervision of regulated persons

Since 2003, the AMF has aimed at protecting investors according to two rulebooks to which all market participants are subjected: the Monetary and Financial Code and the Rulebook of the AMF. By detecting and punishing financial crimes, the AMF targets to compensate for past misdeeds, to set example, and to deter future financial crimes, to escape from being stigmatized if caught. Enforcement contributes to the guarantees to investors and might contribute to allure investments by guaranteeing safe financial markets.

To achieve these goals, the Data and Markets Department carries a pivotal role in the AMF: it oversees continuously the market surveillance, to detect abnormalities in the markets and possibly alleged financial crimes, either in terms of trends or of frequency of orders.[11] This market surveillance is mostly computerized, complemented with artificial intelligence and big data technologies. Since 2003, 25,000 alerts were generated on average *per* year by the AMF big data platform, with a declining trend since the late 2000s thanks to progress in the quality of data and algorithms.[12] The efficiency of the market surveillance is constrained by a scissor effect.

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[11] https://www.amf-france.org/en/amf/our-organization/our-governance.

[12] 6057 were generated by the market surveillance in 2021.

Table 4 Descriptive Statistics of the Supervision and Enforcement by the AMF

		Avg 2004–2021	Min	Max	Std. dev	Trend***
(1) AMF supervision activity (since 2004)						
Market surveillance	Alerts from AMF market surveillance (no data for 2010–2012, as number)	25,076	3	1469	55,000	+ then –
	External suspicious transaction reports (since 2006, as number)	566	95	1280	459	+ then =
Investigations	Initiated *per* year (as number)	74	44	97	15.4	–
	Statements of objection sent *per* year (as number)	16	6	38	8.8	–
	Cases transmitted to the *Parquet National Financier per* year (as number)	15	4	25	5.9	–
Controls	Initiated *per* year (as number)	72	36	138	29.6	–
	Statements of objection sent *per* year (as number)	13	6	19	4.2	=
(2) AMF enforcement activity						
(2.1) Sanctions published (393 since 2004)						
General features	Sanction procedures initiated by an investigation *per* year (as % of sanctions)	64.9%	35.7%	94.1%	0.2	–
	Sanctions published *per* year (as number)	21.8	15	33	5.6	+ then –
	o.w. acquittals *per* year (as number)	1.8	0	6	1.9	–
	Listed firm(s) victim(s) of the breach(es) (as %)	25.5%	6	45	0.1	+ than –
Sanctioned breaches *per* year	Market abuses (as %)	56.5%	35%	80%	0.1	+ then –
	Insider dealing (as %)	27.7%	6%	50%	0.1	+ then –
	Price manipulation (as %)	9.7%	0%	19%	0.1	+ then –
	Breach of public disclosure requirements (as %)	32.8%	6%	55%	0.1	–
	Breach(es) of professional obligations (as %)	53.4%	33%	76%	0.1	=
	Listed firm(s) victim(s) of the breach(es) (as %)	25.5%	6%	45%	0.1	+ than –

Table 4 (continued)

		Avg 2004–2021	Min	Max	Std. dev	Trend***
Verdicts	1. Cumulated cash fines *per* sanction (when sanctioned, as '000 EUR)	1037	0	37,020	3555	+
	Cash fine *per* sanctioned natural person (when sanctioned, as '000 EUR)	245	0	7200	671	+
	Cash fine *per* sanctioned legal person (when sanctioned, as '000 EUR)	657	0	35,000	2725	+
	2. Verdicts involving behavioral sanctions *per* year (as %)	30.3%	13.0%	70.6%	0.2	– then +
	Behavioral sanctions *per* year (as number)	11.8	4	27	5.5	– then +
	Sanctions involving warning(s) *per* year (as % of total)	17.6%	4.3%	35.3%	0.1	– then +
	Sanctions with warnings on natural persons, *per* year (as number)	2.1	0	5	1.6	–
	Sanctions with warnings on legal persons, *per* year (as number)	2.6	0	6	1.8	– then +
	Sanctions involving blames(s) *per* year (as % of total)	11.7%	0.0%	52.9%	0.1	– then +
	Sanctions with blames on natural persons, *per* year (as number)	1.6	0	5	1.3	=
	Sanctions with blames on legal persons, *per* year (as number)	1.9	0	8	2.0	– than +
	Sanctions involving ban(s) on activity *per* year (as % of total)	6.4%	0.0%	28.6%	0.1	+
	Sanctions with ban(s) on activity on natural pers., *per* year (as number)	1.4	0	4	1.2	+
	Sanctions with ban(s) on activity on legal persons, *per* year (as number)	0.5	0	3	1.0	+
	3. Full anonymization rate of sanctions when published *per* year (incl. partial) (as %)	14.5%	0.0%	48.3%	0.1	+ then –
	Partial anonymization rate of sanctions when published *per* year (incl. partial) (as %)	12.5%	0.0%	50.0%	0.1	+ then –
	Current full anonymization rate of sanctions *per* year (incl. partial) (as %)	51.7%	0.0%	100.0%	0.4	–
Appeals	Appeal rate of sanctions *per* year (as %)*	45.8%	19.2%	76.2%	0.1	=
	Confirmation rate of sanction decisions *per* year (as % of appeals)*	73.9%	33.3%	100.0%	0.2	–

Table 4 (continued)

		Avg 2004–2021	Min	Max	Std. dev	Trend***
Duration of procedures	Duration of the breach(es) (in years)	1.1	0	10.0	1.2	+
	Lag between the beginning of the breach(es) and the ignition of the enforcement procedure (when disclosed in the sanction report, in years)**	1.3	−0.9	8.8	1.2	+
	Duration of the AMF enforcement procedure (in years)	2.9	0.7	9.0	1.0	+
	Duration from the ignition of the breach until the sanction (in years)**	4.2	1.4	10.9	1.5	+
	Duration of the appeals (in years)	1.9	0.3	7.2	0.9	−
Characteristics of the sanctioned person(s)	Number of persons sanctioned per sanction (as number)	2.1	0	20	1.9	=
	Natural persons sanctioned per sanction (as number)	1.1	0	20	1.7	=
	Legal persons sanctioned per sanction (as number)	0.9	0	5	0.8	=
	Sanctions targeting natural persons per year (as %)	59.8%	34.6%	85.7%	0.1	=
	Sanctions targeting listed firms (and employees) per year (as %)	33.3%	5.6%	55.0%	0.1	−
	Sanctions targeting employees of listed firms per year (as %)	25.4%	0.0%	50.0%	0.1	−
	Sanctions targeting asset management firms per year (as %)	22.4%	5.0%	40.0%	0.1	+
	Sanctions targeting private firms per year (as %)	16.8%	5.0%	34.6%	0.1	+
	Sanctions targeting investment firms per year (as %)	9.7%	0.0%	30.0%	0.1	−
	Sanctions targeting banks per year (as %)	20.4%	5.3%	40.0%	0.1	−
	Recidivist legal persons (as %)	21.1%	5.0%	47.6%	0.1	+then=
	Procedures targeting foreign legal persons per year (as %)	12.5%	0.0%	22.2%	0.1	+
	Legal person experiencing financial difficulties (as %)	25.6%	7.1%	40.0%	0.1	=
	Sanctions targeting the top management per year (as %)	47.6%	28.6%	76.2%	0.1	+

Table 4 (continued)

(2.2) Settlements (86 since 2012)	Avg 2004–2021	Min	Max	Std. dev	Trend***
Settlement procedures initiated by an investigation (possible since 2016, as % of total settlements)	48.1%	15.4%	66.7%	0.2	+
Settlements for market abuses (as % of total settlements)	24.4%	0.0%	62.5%	0.3	+
Total number *per* year (as number)	9	5	13	3.2	+ then =
Average cumulated cash fines per settlement (as '000 EUR)	155	10.0	600	143.2	+ then –
Sanctions targeting legal persons *per* year (as %)	82.6%	61.5%	100%	0.2	–
Duration of the procedure (in years)	2.3	1.3	4.8	0.7	+

The table displays the main descriptive statistics of the supervision and enforcement as undergone by the AMF since 2004 if not specified alternatively (average, minimum, maximum, standard deviation, and trends). This hand-collected data capitalizes mostly on publicly available information, and in particular on the AMF annual reports, on the alerts issued by the AMF and, most importantly, on the sanction and settlement reports published on the AMF website. These reports (13 pages on average) typically include descriptions of the alleged financial crime(s) (nature of the breach(es), parties at stake, dates, enforced laws), of the steps of the enforcement procedure, and the verdict. The dataset is complemented by regulatory information when needed, shared by the AMF (such as the identity of anonymized sanctioned persons, and missing procedure dates)

Sources: AMF, Author. *As available on 01/01/2023. ** Information on the timing of the breach(es) is available for 93% of the sanction decisions. ***The trend means increasing (+), stable (=), or contracting (−) over the period (2004–2021), if not specified alternatively

On the one hand, crime detection is becoming harder due to the combination of factors: (1) financial products are increasingly sophisticated and complex; (2) the speed of transactions is rising with the High Frequency Trading (HFT) and the algorithmic trading; and (3) information channels and the volume of news increased dramatically over the last two decades, to the point that more and more research investigates the consequences of information overload (Ripken, 2006). The complexity of financial products—which can be used to try and circumvent financial regulations—was illustrated by a highly publicized sanction due to the misuse of total return swaps leading to the communication of false information (SAN-2011-02).

On the other hand, regulators are tied by long legal and codified procedures and strongly budgetary constrained, which make it challenging—to say the least—to keep pace with the fast-innovating financial industry. How to reform rapidly to-some-extent outdated regulations to catch up with new commercialization channels and new investment opportunities, for example crypto-assets and non-fungible tokens? Or how to attract and retain competences as well as to fund large investments needed in soft- and hard-wares to catch up with regulated persons? A very salient example is the long-and-still-debated impact of HFT and algorithm trading on the price discovery and efficiency (Brogaard et al., 2014). Beyond notorious flash crashes such as in the U.S. on May 6th, 2010 (Kirilenko et al., 2017), the literature is not conclusive regarding the impact of HFT on price manipulations (Aitken et al., 2015). It is worth stressing that two sanctions involved price manipulations through layering subsequent to algorithmic trading (SAN-2015-20) and through flickering orders sent by a high frequency trader (SAN-2016-11). The complexity of these two procedures is illustrated by much longer procedures than on average (6.5 years versus 4.2 years).

In addition to the Data and Markets Department, two other departments supervise specific populations of regulated persons and might detect alleged financial crimes: (1) the corporate finance and corporate accounting department,[11] by monitoring periodic financial publications of listed firms and their interpretation of the accounting standards principles (IFRS), and (2) the asset management department. As a first step, bilateral communication and search for remedies are privileged when breach(es) are alleged, possibly followed by enforcement procedures if no remedial solution is found.

Over the period under review, the great majority of the sanctioned breaches were detected by the AMF oversight of markets and market participants, pleading for investments to support the efficiency of their market surveillance.

3.2 Foreign authorities, shareholders and stakeholders: marginal contributors to fraud detection

In addition to shareholders, a wide range of stakeholders monitors financial markets and consequently contribute to detecting financial crimes: auditing firms, which should play a role in the prevention and the detecting of financial crimes (Francis, 2004), stock exchanges, clients, institutional investors (Chung et al., 2012), financial analysts (Yu, 2008), and employees (Dyck et al., 2010). On average, since 2006, the

AMF has been receiving an increasing number of external suspicious transaction reports (566 on average *per* year, and 1280 in 2021), a third of which were received from other European financial market authorities.[13] Still, only 3.6% of the sanction decisions derailed from breach(es) originally reported to the AMF by other market participants: (former) clients, (minority) investors, individuals, former employees, and auditing firms.

Beyond a few high-profile failures (in particular in the U.S.), little is known about the role of auditing firms in the detection of frauds or about the general level of the audit quality, bearing in mind the inherent conflict of interest of being paid by those whose financial accounts accuracy one certifies. Feroz et al. (1991) assessed that 20% of the U.S. Securities and Exchange Commission (SEC) enforcement actions involved a failure of the auditors to detect their client's fraud potential. Some scandals even involved the provision of false and misleading financial information and documents to deceive enforcers, as exemplified in the U.K. in July 2022.[14] In France, auditing firms contributed to the detection of financial crimes by raising concerns regarding the accounts of firms before the launch of the enforcement procedures in 4.8% of the decisions. Additionally, if the auditing firms and/or the auditors were on some occasions investigated for breaches to their duties (5.9% of the decisions), most frequently for certifying inaccurate financial statements, these procedures concluded in the end that they were guilty of the alleged financial crimes in a third of those cases (2% of the decisions).

3.3 Whistleblowers

Financial crimes can alternatively be identified and documented by whistleblowers, making the enforcement more efficient in terms of timing and understanding of the frauds. As stressed by the U.S. SEC, whistleblowing has major assets for enforcers and investors in that it "minimize(s) the harm to investors, better preserve(s) the integrity of the United States' capital markets, and more swiftly hold(s) accountable those responsible for unlawful conduct".[15] The Office of the Whistleblower was established by the U.S. Congress mid-2010, in Sect. 922 of the Dodd-Frank Act. Still, whistleblowers need protection, which was formalized with subsequent financial rewards in some countries such as the U.S., Canada,[16] South Korea,[17] Lithuania,[18] and Slovakia.[19] In the U.S., to encourage whistleblowers and compensate for the consequences, this Office of the Whistleblower awarded approximately 1.2

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[13] Since July 2006, investment service providers have to report to AMF all suspicious operations of their clients.

[14] https://www.frc.org.uk/news/july-2022/sanctions-against-kpmg-and-others-in-connection-wi.

[15] https://www.sec.gov/whistleblower.

[16] https://www.osc.ca/en/enforcement/osc-whistleblower-program.

[17] https://www.acrc.go.kr/en/board.do?command=searchDetail&method=searchDetailViewInc&menuId=020501&boardNum=67072.

[18] https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/267de1c2a9b911eb98ccba226c8a14d7?jfwid=-15hio16ale.

[19] https://transparency.sk/wp-content/uploads/2021/03/Slovak-Act-on-Whistleblowing-2019-1.pdf.

billion USD to 236 persons from the enforcement of the awards in 2012 until late 2021 (ranging from 10 to 30% of the over-1-million-USD fines collected, with a record 114 million USD granted in October 2020).[20]

The European Union took another stance: protecting whistleblowers without financial compensation, in order to avoid a shift to a denunciation society.[21] The AMF formalized the whistleblowing between 2016 and 2018, offering professional and confidentiality guarantees.[22] To date, it is impossible to assess the magnitude and the spillovers of whistleblowing on enforcement, as the AMF argues that the safeguards against breaching professional secrecy and confidentiality rules impede any communication. AMF only stated that it received 72 reports from whistleblowers over the first two years (2016–2018). The numbers are surprisingly low. For example, the German BaFin received 2281 whistleblowing tip-offs in 2021, a number which has been growing continuously since its launch in 2016 (124 over a semester). Since then, no French information on the volume of reports has been issued, nor on the consequences (investigation, sanction, etc.).[23] Still, given the length of the procedures (2.9 years on average, see Fig. 1), the prosecution of breaches identified by whistleblowers could soon be brought to the AMF Enforcement Committee.

3.4 Spillovers from other financial crimes

In globalized financial markets, large foreign financial scandals can also hit French market participants, which can end up being sanctioned for lack of diligence in their duties regarding those financial crimes. Two notorious U.S. financial scandals led to AMF sanctions: the Madoff investment scandal, with the Ponzi scheme revelation in late 2008, and the 2008 subprime crisis. On three occasions, asset management firms were sanctioned due to their exposure to *Bernard L. Madoff Investment Securities* (SAN-2011-17, SAN-2011-18, and SAN-2012-15). The subprime crisis was also echoed by sanction decisions, in one case due to insider trading of a top manager exploiting information on the spillovers of the subprime crisis on his bank (SAN-2010-17) and in second one due to the liquidity repercussions of the crisis on money market funds (SAN-2009-25).

3.5 The media: a watchdog?

The media can be perceived by investors as a watchdog (Miller, 2006), which credibility is a priori supported by the lack of conflict of interest and more independent

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[20] https://www.sec.gov/news/press-release/2021-177.

[21] EU Directive (2019/1937) on the protection of persons who report breaches of Union law. In the U.K., in 2014, the Financial Conduct and the Prudential Regulation Authorities rejected financial rewards for whistleblowers working in their regulation scope (https://www.fca.org.uk/publication/financial-incentives-for-whistleblowers.pdf).

[22] https://www.amf-france.org/fr/reglementation/doctrine/doc-2018-13.

[23] https://www.amf-france.org/sites/default/files/contenu_simple/rapport_annuel/rapport_annuel_amf/Rapport%20annuel%202018%20de%20l%27AMF.pdf.

sources of information than analysts and corporations (Kothari et al., 2009). Dyck et al. (2010) and Miller (2006) stress how the press helps uncover accounting frauds, by rebroadcasting information from other sources, or by uncovering frauds after investigations. In some countries, typically the U.S., a great part of the financial crimes sanctioned by the SEC was in the first place revealed by the media. This is not the case in France where only two—though significant—sanction procedures were initiated by investigation articles uncovering alleged financial crimes (SAN-2010-18 and SAN-2017-07). Firstly, in November 2008, a front-page article in *La Tribune* alleged that a bank lost more than a billion euros due to losses on proprietary trading over the previous month.[24] This allegation was denied by the bank on the very same day, but led the AMF to initiate an investigation regarding the financial information published by the bank. The bank was, in the end, dismissed from charges in 2010. Seven years later, in April 2015, *Mediapart* published an investigation challenging the business ethics of the asset management branch of the same bank.[25] This article alleged mis-selling of financial products to unsophisticated investors, echoing other U.S. scandals like the Goldman Sachs Abacus synthetic CDOs in the early stages of the subprime mortgage crisis. In the end, the AMF Enforcement Committee charged the bank with the highest-ever fine (35 million euros). The appeal of the decision led to a significant reduction in the fine to 20 million euros, still a record high back then.

Conversely, the business ethics of the media were on some occasions questioned by the AMF Enforcement Committee, as any allegation of financial crime needs to be duly documented, not to become synonym of false information. One is account-able for its opinions, though the freedom of speech and the principle of confidenti-ality of sources should not be violated. On three occasions, the AMF sanctioned a publishing director or its economic publishing group due to the non-disclosure of his conflicts of interests when publishing investment recommendations on a stock which they were exposed to (SAN-2011-01, SAN-2014-04, and SAN-2020-01).[26] Addi-tionally, five sanctions reminded the need for high standards of ethics of journalists (whatever their outlets and nationalities) and of their employers. For the first time in 2010, the AMF sanctioned an individual for repeatedly spreading false or mislead-ing information about a listed firm on the Internet (boursica.com, SAN-2010-01). In 2012, two bloggers were sanctioned for spreading false information about the lever-age of a French bank (Tier 1 ratio) and for fueling rumors regarding its solvency in the middle of the sovereign debt crisis (SAN-2013-24). More recently, a global U.S. media and a journalist were respectively sanctioned for the diffusion of false infor-mation (fake financial press releases regarding a massive accounting restatement) impacting the price formation (SAN-2019-17) and for communicating inside infor-mation to key contacts on market rumors regarding two take-over bids (in 2011 and

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[24] https://www.latribune.fr/journal/archives/edition-du-1211/65184/natixis-a-perdu-unmilliard-deuros-sur-les-marches.html.

[25] https://www.mediapart.fr/journal/economie/280415/natixis-les-clients-gruges-pour-gonfler-les-bonus. https://www.mediapart.fr/journal/economie/300515/des-millions-d-epargnants-ont-ete-leses-par-natixis-asset-management?onglet=full.

[26] The same publishing group is being investigated for price manipulation and non-disclosure of con-flicts or interests early 2022.

2012), ahead of the publication of the news in the *Daily Mail* and precising market rumors (SAN-2018-13). Subsequently to this decision, the Court of Appeal of Paris requested for a preliminary ruling to the European Court of Justice in July 2020 on whether the information of the forthcoming publication of an article relaying market rumors can be considered as inside information, and consequently be subjected to insider dealing regulations?

4 Punishment of financial crimes

The rationales for punishing financial crimes are that only serious—as opposed to "trivial"—detected financial misconducts are sanctioned, and that such sanctions contribute to deter future misconducts and will set example (Guy & Pany, 1997; Karpoff et al., 2017; Liu & Yawson, 2020). Serious frauds assume the existence of deliberate or "intentional" dishonesty or deceit (Sievers & Sofilkanitsch, 2019), which would cause market participants (shareholders, stakeholders, analysts, etc.) to alter their opinion of the firm. Otherwise, they are unintentional errors, which can be corrected.[27] This section details a retrospective description of supervision and enforcement since the creation of the AMF, echoing the descriptive statistics displayed in Table 4.

4.1 Legal framework of financial crimes punishment in France

The creation of the AMF in 2003 introduced a formal separation of the office of prosecution (investigations and controls conducted by the AMF under the authority of the Chairman, leading to a statement of objection) and of the judgment function, with the sanctions decided by the Enforcement Committee (see Figs. 1, 2).

Enforcement procedures remain confidential until the Enforcement Committee hearings (*i.e.* trials, see Fig. 2), for the sake of the presumption of innocence of the defendant(s). Defendants are not even named before the hearings. Typically, journalists attend the hearings and frequently publish articles in the aftermath. Still, on a few occasions, there were some leakages of information to the press during the confidential phase of enforcement. For example, a very notorious example is the former head of investment banking of a bank who used insider information (the knowledge of the new internal model of credit risk) amid the subprime mortgage crises (SAN-2010-17). He leaked confidential information on the ongoing procedure, claimed he would be cleared from charges, before resigning and being sanctioned.

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[27] Errors can result, for example, from the enforcement of new accounting standards (IFRS, U.S. GAAP for example), a modification in the consolidation perimeter (in the aftermath of stock splits, M&As, or divestitures for example), or presentation issues (due to changes of the accounting periods, or changes in business segment definitions for example). Hennes et al. (2008) found that 24% of the restatements in the U.S. filed between 2002 and 2005 were intentional frauds, and not errors. Unintentional errors are unlikely to send a comparable message to the market (Hennes et al., 2008). Lev et al. (2008) demonstrated that restatements involving admitted fraud have considerably more adverse implications for investors than non-fraud restatements.
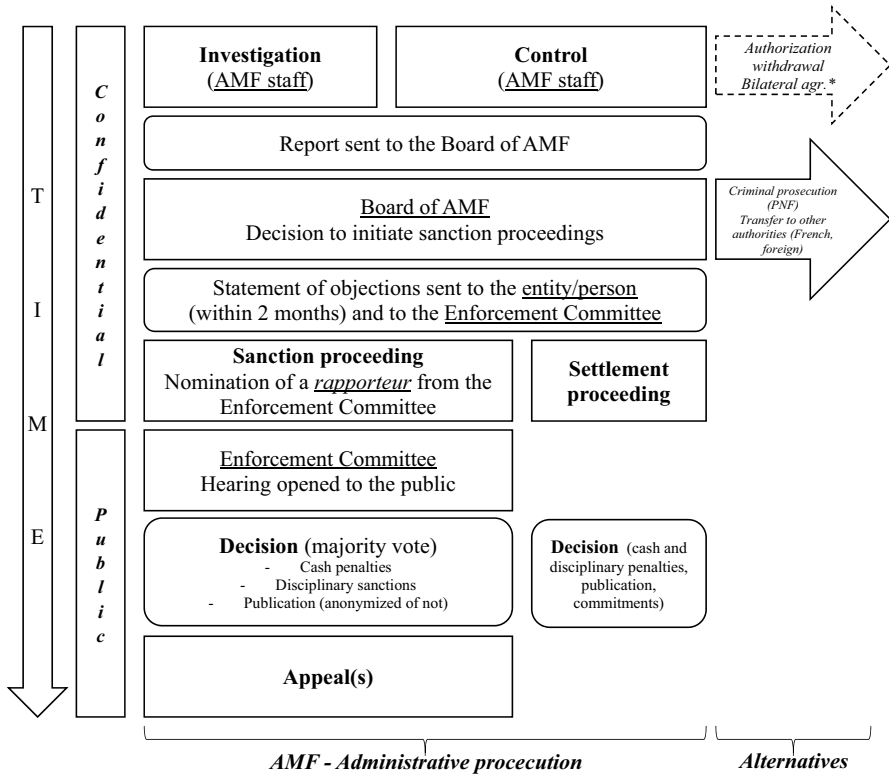
Fig. 2 Main steps of enforcement procedures. The figure presents a simplified view of the consecutive steps of prosecution for financial crimes as enforced by the AMF from the launch of an investigation (for alleged market abuses) or a control (compliance with one's professional obligations as a regulated person) until possible appeals toward three courts (Court of Appeal of Paris, Court of Cassation, and Priority question on constitutionality). Sanctions must be appealed for within two months after the notification of the sanction decision by the defendant or/and by the chairman of the AMF. Still, the great majority of alleged financial crimes are confidentially dealt with by the AMF, asking the incriminated entity to implement remedials or by withdrawing professional authorizations. Since 2016, the AMF and the National Financial Prosecutor (PNF) have been deciding jointly for every financial crime between administrative and criminal prosecutions. *Source*: Author. * Bilateral agreement between the AMF and the regulated person

Seven reforms enlarged and tightened the scope of supervision of the AMF, partly resulting from the transpositions of European Directives and Regulations (see Table 3). Consequently, AMF enforcement powers have been enlarged: (1) widenings of the scope of sanctioned financial crimes and of market participants, echoing the ongoing financial innovation; (2) significant increases in the upper limit for pecuniary sanctions (from 750 000 to 1.5 million euros in 2003 with the *Loi de Sécurité Financière*, to 10 million euros in 2008 with the *Loi de Modernisation de l'Economie,* and to 100 million euros for legal persons in 2010 with the *Loi de*

Régulation Bancaire et Financière)[28]; (3) the Enforcement Committee hearings became public in 2010, to increase transparency and the subsequent echo of the sanctions as an example setting; (4) the AMF Chairmen were granted in 2010 the power to appeal sanction decisions of the Enforcement Committee, to challenge their verdicts and comfort their analysis of the alleged breach(es); and (5) the prescription limit was raised from 3 to 6 years (as for criminal laws) in 2019, supported by the average 4.2 years between breach(es) and their sanction (see Fig. 1). Additionally, two reforms aimed at offering shorter and cheaper alternatives to sanction procedures. First, the AMF has been publishing "alerts" (so-called *mise en garde*) since 2010 regarding some unauthorized persons, some unrealistic investment products, or some illegal activities.[29] Second, settlements have been offered to defendants by the AMF since 2010, along with the statement of objection, for the least though serious breaches to professional obligations, or types of breaches which were already sanctioned (no need for jurisprudence). In 2016, the scope of settled breach(es) was enlarged to market abuses.[30] If accepted (which happens most frequently), the settlement has to be validated by the Board of the AMF and homologized by the Enforcement Committee. The alleged advantages are shorter procedures and no guilt recognition, which comes at the expense of the impossibility to appeal decisions and the implementation of remedial measures. Lastly, a critical change came with the enforcement of the *non bis in idem* European principle. Until mid-2016, financial crimes could be sanctioned through administrative (by the AMF) and criminal (by the National Financial Prosecutor) prosecutions. Criminal prosecutions can entail fines, as for administrative prosecutions, but also imprisonment sentences and seizures. Ever since, alleged financial crimes go through a referral process between the AMF and the National Financial Prosecutor (see Fig. 2). Consequently, no legal action can be instituted twice for the same cause of action, which is equivalent to the double jeopardy doctrine in common law jurisdictions.

4.2 Financial crimes punishment

The vast majority of the breaches are undetected and most of the alleged financial crimes are dealt with bilaterally (and confidentially) between the AMF and regulated persons, as illustrates the gap between the number of decisions (close to 27 sanctions and settlements *per* year) and the thousands of alerts by the AMF market surveillance to which add hundreds of external suspicious transaction reports (see Tab. 4). This communication between the AMF and the involved person(s) can be formal (for example with observation letters at the end of an investigation or a control to remind the applicable regulation, or with a withdrawal of authorization of activity) or informal, as part of the daily supervision of regulated persons, typically asking for additional information. Only the most serious allegations lead to investigations

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[28] The upper limit for natural persons is 15 million euros. Alternatively, fines can amount up to ten times the gained profits or avoided losses. See Table 3 for details.

[29] https://www.amf-france.org/fr/listing_format/format-du-contenu/mise-en-garde.

[30] The first settlement was signed in 2012.

or controls: 44 investigations of alleged market abuses and 51 controls for breach(es) of professional obligations were initiated in 2021, compared to 6057 alerts and 1280 suspicion transaction reports. Even less alleged breaches end with settlement or sanction procedures: on average, over the period under review, a fifth of the 74 investigations and 72 controls initiated *per* year (with declining trends) ended with statements of objection, and even less with sanctions or settlements (18%).

The AMF made a limited number of decisions: 393 sanctions published since 2004 and 86 settlement since 2012 (22 sanctions and 9 settlements *per* year, see Fig. 3). Since a peak in 2009, the number of published sanctions *per* year has been declining, a trend which has been partly compensated by settlements (see Fig. 3).[31] 65% of the sanctions were initiated by investigation procedures and 56% of the sanctions punished market abuses, with a declining trend over the last few years, partly compensated by the increase in market abuses settled. In total, 1.3 types of breaches were sanctioned *per* decision.
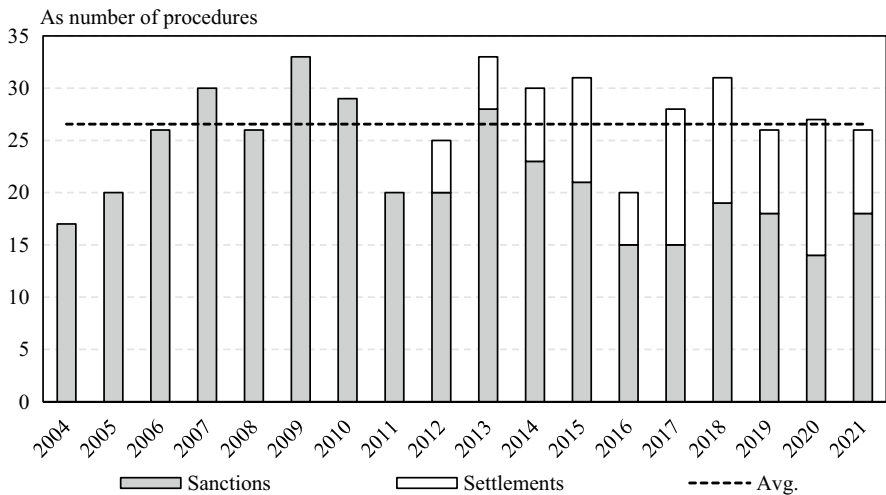

Fig. 3 Number of sanctions and settlements *per* year. The figure depicts the number of sanctions and settlements published *per* year on the AMF website, based on their years of publication. On average, 27 decisions were made *per* year. *Sources*: AMF, Author's calculations (based on the publication year of the decision)

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[31] A similar break in trend is observed in the U.K. by Ashton et al. (2021), with a drop in the number of cases of financial misconduct that would be driven by improved deterrence. Regarding the more recent years, the Covid has to be accounted for in 2020–2021, with possible delays in enforcement procedures. Still, no catch-up happened in 2022, with only 12 sanctions and 7 settlements filed mid-November. And the mid-term perspectives subsequent to the Covid could be limited as Cumming et al. (2021) estimated that traders, employed in a U.K. investment bank, are less likely to commit trading misconducts (insider trading and price manipulation) when working from home, using data from the internal bank's supervisory systems.

Sanction decisions conclude with guilty (92% of the sample) or acquittal (8%) verdicts.[32] The verdicts are comprised of three parameters: (1) cash fines, paid to the French Treasury or to the guarantee fund to which the professional belongs[33]; (2) three types of behavioral sanctions on natural or legal persons (warnings, blames, or temporary or definitive ban(s) from activity, ordered by rising severity); and (3) the possible (partial) anonymization of the defendant(s), if the disclosure of their identity is likely to cause serious and disproportionate damages to the defendants or the new owner, or could seriously disrupt the financial system stability or ongoing enforcement procedures.

In total, 371 million euros of cash fines were imposed by the AMF. Cash fines have amounted to 1 million euros on average for guilty sanctions since 2004, and close to quadrupled over the period under review (see Fig. 4A, B).[34] This growth is particularly marked for sanctioned legal persons (see Fig. 4C). In addition, close to third of the verdicts convey behavioral sanctions, impacting on average 12 persons *per* year (see Fig. 4D). Their recourse trended down from 2004 to 2014, and has been regaining traction ever since. Their frequency is inversely correlated to their severity, most frequent sanctions being the warnings (18% of the sanctions) followed by the blames (12%), evenly distributed between natural and legal persons, and more marginally by (temporary or definitive) bans on activity (6%, for 6.7 years on average), targeting mostly natural persons and with a rising frequency since the mid-2010s.[35] Conversely, the recourse to (full or partial) anonymization of the defendants gained traction between 2008 and 2012 (up to 60% of the decisions), before moderating down to 18% over the last five years. Overall, 15% of the sanctions were fully anonymized when published, and 13% partially. Additionally, until 2018, retrospective anonymizations were decided at the discretion of the Chairmen of the Enforcement Committee. Since then, the anonymization rule has been formalized, with a right to oblivion for any natural person information included in sanction reports after five years. Consequently, the rate of full and partial anonymization of the sanction reports now available is much higher (52% and 19% respectively), particularly high for the older decisions. 65% of the sanctions published between 2004 and 2013 are fully anonymized, and 21% partially. This contributes to the interest of this article which surveys exhaustively the 393 sanctions published by the AMF.

The verdicts of settlements are less severe than for sanctions, with significantly lower cash fines of 155,000 euros on average since 2012, ranging from 10,000 to

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[32] Acquittals are verdicts, not type one errors (*i.e.* false positive error), when a benevolent firm is misclassified as fraudulent (for example when using datasets of alleged securities litigation lawsuits or private class action lawsuits, which are more profit oriented). Type two errors are impossible to circumvent given the incomplete detection (partial observability of fraud) inherent to any sample construction for fraud. The great majority of fraudulent firms are mistaken as non-fraudulent, and their financial crimes remain undetected. Hence, this sample selection can be potentially biased, for example by how a regulator detects and prosecutes alleged misconducts.

[33] Article L.621-15 III of the Monetary and Financial Code.

[34] 16 sanction decisions (4% of the sample) were guilty verdicts only assorted with behavioral sanctions. Consequently, the cash fines were set to zero and accounted for in the averages.

[35] Such bans are a lot more frequent in the U.S., in 49% of the SEC administrative procedures (Gadinis, 2012).

600,000 euros, standing for 13 million euros of cumulated fines. Since the widening of the scope of breaches opened to settlements to the market abuses in 2016, four evolutions have happened: (1) a rapid increase in the share of settlements initiated by an investigation (55% of settlements between 2019 and 2021, against 31% on average), (2) a subsequent increase in the market abuses settled (41% of the settlements between 2019 and 2021, against 24% on average), (3) a steady increase in natural persons settling (38% of settlements over 2019–2021, against 19% on average), most frequently being top managers (69%),[36] and (4) a lengthening of procedures (2.7 years between 2019 and 2021, against 2.3 years on average). The duration of settlements tends to converge with the one of sanctions (3.0 and 3.4 years respectively in 2021), in contradiction with its initial goal of offering shorter and cheaper procedures (see Fig. 5D). Still, this reform did not translate into tougher verdicts, questioning whether settlements are sufficiently punitive to deter wrongdoing: fines remain significantly lower for settlements than for sanctions and have not increased since the scope was enlarged to market abuses (see Fig. 4A). In that sense, settlements could appear an option to escape responsibility for one's actions by minimizing the expected fine, at the cost of losing the possibility to appeal and of enforcing remedial measures, with close to equally long procedures. As stressed MacDonald (2012) regarding the SEC settlements, "settlements are not adequately deterring the violations of securities laws", in particular for large financial institutions.
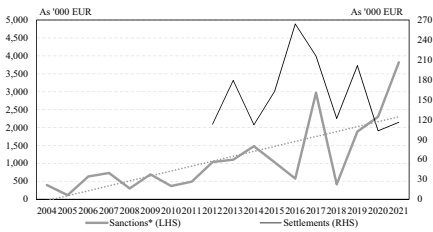
Finally, since 2010, the AMF has been issuing "alerts" (so-called *mise en garde*) regarding some unauthorized persons, some unrealistic investment products, or some illegal activities such as boiling room or pyramid schemes.[37] A total of 194 alerts were issued until late 2021 (16 *per* year on average), mostly targeting foreign (68%) firm(s) (89%), offering high-yield investment opportunities through a web-page (79%), without being dully authorized (87%). 42% of the alerts were updates of AMF blacklists of risky companies for investors regarding forex, binary options, miscellaneous assets (such as diamonds, art, or containers), and crypto-assets since 2018.[38] Frequently, the misdeeds were detected by investors, who warned the AMF. Such misdeeds were subsequently transmitted to the National Financial Prosecutor. In that sense, the AMF "names and shames" persons or misconducts rapidly and at a low cost to protect investors, hence using efficiently a soft law enforcement tool (Chouhury, 2018). The ultimate goal is to impose a stigma on wrongdoers by penalizing their reputations, and to promote and shape higher-standard social norms. Still, these alerts (synonym of a light-touch enforcement) question the information transmission to investors. To what extent do investors access and account for the AMF alerts? Are they efficiently damaging reputations, when some persons were repeatedly named in alerts? The actions brought before the Paris Regional Court (*Tribunal de Grande Instance*) by the AMF since 2014 appear more efficient in obtaining court orders blocking access to these illegal websites.

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[36] Still significantly less in the U.S., with natural persons standing for 71% of SEC settlements in 2011 (MacDonald, 2012). As in the U.S., all the settlements between the AMF and large commercial and investment banks (16% of the settlements) involved only the legal person, never natural persons.
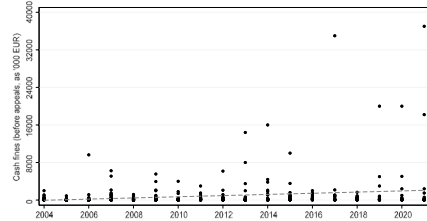
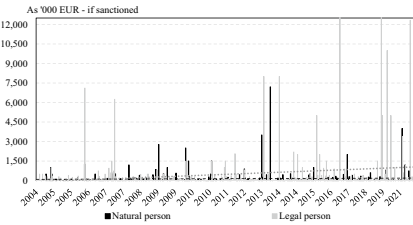[37] https://www.amf-france.org/fr/listing_format/format-du-contenu/mise-en-garde.

[38] https://www.amf-france.org/en/warnings/warnings-and-blacklists.
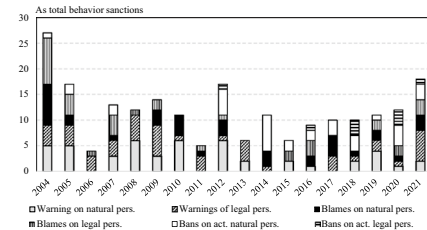
Fig. 4 Verdicts for sanctions and settlements per year. The figure depicts time developments for the main features of the verdicts of sanctions and settlements along time, in euros for the fines and in number of the behavioral sanctions: **A** Average fine for sanctions* and settlements; **B** Distribution of fines for sanctions*; **C** Cash fines by sanctioned person (legal or natural), with respective linear trends**; **D** Behavioral sanctions by sanctioned person. *Sources*: AMF, Author's calculations (based on the publication year of the decision, as available on 01/01/2023). *If sanctioned (i.e. excluding acquittals from the scope). **If the sanctioned person only receives a behavioral sanction (warning, blame, or ban from activity), the cash fine is set to zero. The two largest sanctions on listed firms are not depicted on the graphs (35 mn and 20 mn in 2017 and 2019), for the sake of readability

4.3 Characteristics of defendant(s)

Several natural or legal persons are typically involved in the alleged breaches (2.8 on average) and sanctioned (2.1): 1.1 natural persons and 0.9 legal persons are sanctioned, with respectively 245,000 and 657,000 cash fines. Fines on legal persons trended more rapidly up than those on natural persons. The most frequently involved persons are natural persons (60% of the sample), frequently being employees of listed firms (25% of the sample). In 53% of the sanctions, the top management of the firm is investigated, ending being frequently sanctioned (48% of the sample).[39] Some natural persons were repeatedly mentioned (23 recidivist natural persons) and sanctioned (20), respectively in 9.4% and 8.3% of the sanction decisions.

21% of the sanctions were pronounced against recidivist legal persons. In total, 365 firms were incriminated 483 times in sanction reports from 2004 to 2021, either the legal person, or its top manager(s) and employee(s). Most frequently, the firms

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[39] By declining frequencies: chief executive officer (27% of the sanctions), managing director (18%), chairman (11%), chairman or members of the Management Board/Board of Directors (17%), majority shareholder (17%), founders (12%), chief financial officer (8%). Categories are non-mutually exclusive as more than one natural person is sanctioned by decision.

ended being sanctioned (86% of the mentions). 50 firms were repeatedly sanctioned (so called recidivist legal persons), on average 2.9 times. Put if differently, each firm was mentioned 1.35 times and sanctioned 1.1 times on average, with maxima of 15 mentions and 12 sanctions for a given firm.[40] The most frequently incriminated and sanctioned firms are listed firms (respectively 38% and 33% of the sanctions), asset management firms (25% and 22%), private firms (21% and 17%), and investment firms (11% and 10%). The most frequent sector is the banking industry, consistently with the types of white-collar crimes sanctioned by the AMF. Financial institutions stand for 8.5% of the involved firms, 18.6% of the sanctioned firms (73 sanctions and 17 acquittals), and 20% of the sanctions. 31 French and foreign banks were incriminated by the AMF, half of which were recidivist. 19 auditing firms (5.2% of the firms) were involved in sanction procedures (5.9% of the procedures), but were only sanctioned in 8 decisions (2% of the sanctions). Finally, 12% of the procedures involved foreign firms.

Regarding settlements decisions, the most frequent persons are asset management firms (38% of the sample), followed by natural persons (19%, most frequently top managers, standing for 13%), financial advisement firms (17%), and banks (16%).

4.4 Allegation, acquittal, and innocence

Part of the literature investigates market reactions to alleged and/or condemned financial crimes, along the consecutive steps of enforcement (see the graphical illustration in Fig. 2 for France). Most frequently, alleged frauds are revealed by newspaper articles, or by an official corporate or regulatory communication. Feroz et al. (1991) and Pritchard and Ferris (2001) conclude that, in the U.S., the very first hint of a financial crime triggers the most important and significant abnormal market reaction (measured as contracting returns using an event study methodology), even when compared to the sanction publication itself. Solomon and Soltes (2019; p. 1) underline the difference between "not guilty" and "innocent" for the markets: "even when no charges are ultimately brought [after SEC financial fraud investigations], firms that voluntarily disclose an investigation have significant negative returns, underperforming non-sanctioned firms that stayed silent by 12.7% for a year after the investigation begins".

Regarding market reactions to AMF enforcement procedures, the literature stresses the following: (1) no insider information is leaked to the market before the Enforcement Committee hearings, except in exceptional cases (de Batz, 2020a), demonstrating no breach of confidentiality along the enforcement procedures; (2) markets react statistically significantly and negatively to sanction decisions (Constant, 2013; de Batz, 2020a; Kirat & Rezaee, 2019); but (3) not to acquittal decisions (de Batz, 2020a). Over the period under review, as stressed in Sect. 3.5, only two crimes alleged in the media ended sanctioned by the AMF, assorted with very high fines. For that reason, in France, it is not possible to disentangle the reputation cost

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[40] Firms are aggregated at the mother company level. Typically, universal banks encompass their asset management and investment banking branches.
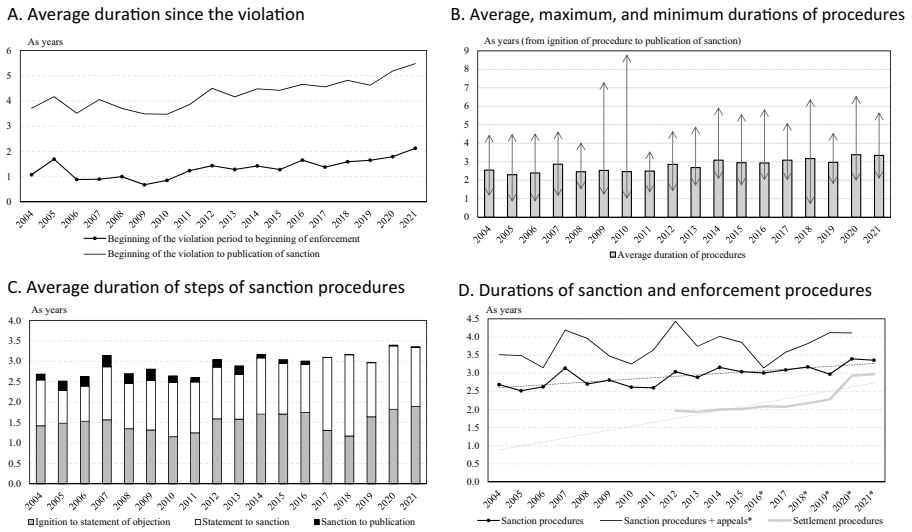
Fig. 5 Length of enforcement procedures *per* year. The figure depicts time developments for the different time indicators for sanction and settlement procedures: **A** is the average duration since the violation, with rising lags between the beginning of the breach and the beginning or the end of the enforcement procedure; **B** depicts the heterogeneity in durations of procedures, with average, maximum, and minimum durations of procedures; **C** details the duration between the four main steps (see Fig. 2): the ignition of the procedure; the statement of objection, the Enforcement Committee hearing making the decision, and the publication of the decision; and **D** compares the total length of sanctions, sanctions including appeals*, and settlements. *Sources*: AMF, Author's calculations (based on the publication year of the decision, as available on 01/01/2023). *If sanction decision appealed and appeal verdict published

of being accused of an alleged fraud from the subsequent sanction decision (contrary to the U.S. for example, as in Karpoff & Lott, 1993).

5 Challenges echoing the French history of enforcement of financial laws

Some indicators support the credibility of the AMF to market participants. A measurable indicator of this credibility is the AMF's identity thefts to deceive investors: seven "alerts" have been issued since 2010 by the AMF regarding individuals or firms pretending working for the AMF or using the "AMF" name.[41] The rising frequency of identity theft since 2020 has led the AMF to issue a specific warning in September 2022.[42] Another indicator of the AMF's credibility is the high though declining confirmation rate of decisions in appeal (74%), with a high rate of appeals (46%), as illustrates Fig. 6. Still, consolidating one's credibility in a rapidly evolving

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[41] https://www.amf-france.org/en/warnings.
[42] https://www.amf-france.org/en/news-publications/news-releases/amf-calls-vigilance-against-fraud ulent-sites-usurping-its-name.
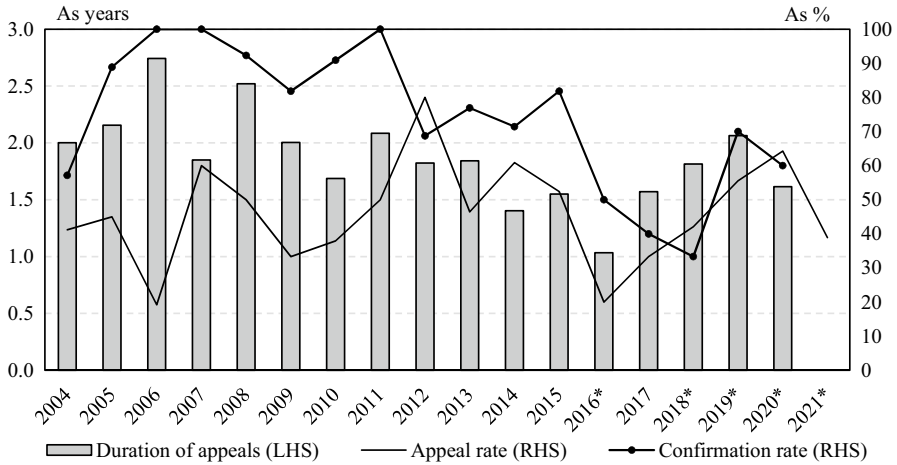
Fig. 6 Characteristics of appeals. The figure details time developments for the key characteristics of appeals: (1) the duration of appeal procedures (1.9 years, with a declining trend), (2) the rate of appeal of sanction decisions (46% of average), and (3) the confirmation rate of decisions in appeal (74%, with a declining trend). *Sources*: AMF, Author's calculations (based on the publication year of the decision) *As available on 01/01/2023

environment is a challenge faced by all enforcers. This section strives to stress some forward-looking challenges in terms of credibility based on the history of French sanctions of financial crimes.

5.1 Multiple concomitant challenges to enforcement: timely, transparent, severe, proportional and independent reactions

The diversity in financial crimes and in defendants contributes to the heterogeneity in procedures, despite following the same milestones (see Fig. 2). As stressed by Kalmenovitz (2021; p. 4745), "in reality not all actions are born equal". The prosecution of alleged complex financial crimes might need more time, people, and efforts to dully document. In other cases, the legal forces enacted by the defendant(s) might greatly slow down and complexify procedures.

Regulatory authorities need to react in the most appropriate and timely manner. Precipitated reactions might waste constrained means by initiating irrelevant procedures. Conversely, prescription limits and up-to-date example-setting plead to speed up procedures, by limiting to the lag between the crime and its sanction. Part of the acquittal decisions (8% of the sanctions over the period under review) were justified by procedural irregularities or prescription limits, which do not acquit the investigated person (for example SAN-2006-09, SAN-2012-03, and SAN-2012-06). Hence, the information content conveyed by an acquittal decision is not straightforward, as acquittals do not always imply innocence. It takes on average 1.3 years to the AMF to initiate an enforcement procedure after the beginning of breach, a lag which tends to increase along time. The breach(es) were still ongoing for 39% of

the sample when the enforcement procedure was launched. In addition, enforcement procedures are long (2.9 years on average), diverse (ranging from 254 days up to 9 years), and lengthened by one year over the period under review (from 2.5 years in 2005 up to 3.4 years in 2021), despite a much faster publication of the decision in the aftermath of the Enforcement Committee (see Fig. 5B, C). All in all, 4.2 years elapse from the beginning of the breach until it is sanctioned, also on a rising trend (see Fig. 1 and Fig. 5A). Additionally, appeals contribute extend procedures, by 1.9 years (see Fig. 5D). In fact, sanctions can be appealed by the defendant(s) (38.8% of the sample) and/or by the chairman of the AMF as the prosecutor (5.6% by both parties, and 1.3% by the AMF), to three different appeal courts.

How does the power to sanction support enforcers' credibility? Market participants should know (and fear) the likely consequences from being caught cheating on the law. Sanctions must be severe enough to be treated as a significant cost of doing business (MacDonald, 2012). In practice, it is critical to bear in mind the imperfect knowledge about the probability of being caught and the magnitude of fines. Still, cash fines are the key, tangible, and immediately comparable determinant of the seriousness of sanctioned breaches, possibly complemented with reputational penalties, particularly significant in Anglo-Saxon countries (Armour et al., 2017; Karpoff & Lott, 1993). Some countries issued clear guidelines on how to set fines. For example, the U.S. introduced, as early as 1991, sentencing guidelines by the U.S. Sentencing Commission.[43] Similarly, the German BaFin has been publishing since 2013 guidelines for administrative fines (including matrixes of upper limit of fines), depending on the severity of the offence, on the defendant's financial capacity, and on the intent with mitigating circumstances.[44]

In France, cash fines are hardly predictable and said to be limited, curbing the subsequent reputational costs (de Batz, 2020a; Kirat & Rezaee, 2019). There is neither binding rule nor transparent guidelines on how to value fines, despite long-lived debates as illustrated by the Noquet (2013) report. As off 2003, the financial law guided the Enforcement Committee with two general principles: the time consistency and the upper limits for fines, in light of the seriousness and duration of the breach(es) and of the magnitude of the obtained gains or advantages (or avoided losses).[45] The legal criteria to be accounted for were enlarged to seven of them in 2016, with the transposition of the European Market Abuse Regulation (see Table 3) and will be further investigated in the next section. Consequently, the Enforcement

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[43] https://www.ussc.gov/guidelines/archive/1991-federal-sentencing-guidelines-manual.

[44] The severity of the offence is estimated depending on the size of the issuer (i.e. its significance for the capital markets) and on the severity of the circumstances of the offence. The specific circumstances are also considered to mitigate (confession, cooperation with BaFin's investigation, promise/measures taken to improve, long proceedings) or aggravate (repeat offense, special deterrence) the fines. https://www.bafin.de/EN/Aufsicht/BoersenMaerkte/Massnahmen/massnahmen_sanktionen_node.html?cms_gtp=10452720_list%253D3%25267953862_list%253D35#ID_10452720.

[45] Since 2010, fines can amount up to 100 million euros for market abuses committed by regulated professionals (or 10 times any benefit derived from the breach if this can be determined, or 15% of the yearly turnover) and up to 15 million euros with regards to natural persons (managers, employees, etc.) placed under the authority or acting in the name and on behalf of regulated professionals (or ten times the amount of the benefit derived from the breach if this can be determined).

Committee faces the challenge to be time-consistent, to support the fairness and credibility of the sanctions, while reflecting the rising upper limit of fines over time. It is reflected by the persistent upwards trend of average cash fines (see Fig. 4A, B), even when excluding the two record-high fines, and by average fines significantly lower than the upper limits.[46] Additionally, the proportionalism of some verdicts was questioned. In fact, the assessment of gains obtained from the breach(es) is crucial to calibrate a fine, but their valuation and meaningfulness are challenging, in particular for larger firms. For example, it can be complex to value profits drawn by the chairman of the multinational from the dissemination of false information (SAN-2004-16).

Finally, a subsequent challenge regarding the efficacy of sanctions and settlements relates to the enforcement of the sentence: the collection of fines, by the French Treasury (most frequently) or by the guarantee fund to which the professional belongs, and the enforcement of the bans from activity. Such enforcement can be particularly challenging when the verdict sets a high fine against a foreign person, such as the 14-million-euro fine set in 2013 on a Lebanese trader for insider trading during a taker-over bid (SAN-2013-22). The Chairman of the AMF stressed in October 2020 "the difficulty in certain cases in recovering the cash fines and the defendants' impoverishment along sanction procedures".[47]

Who to sanction to support enforcers' credibility? This question is particularly relevant for larger (insured) firms and/or their top managers, as demonstrated for the SEC decisions by Gadinis (2012) and de Batz (2020a) for AMF sanction decisions. Sanctioning the top management of a firm (48% of the sample, see Table 4) stresses its direct responsibility and accountability, for example by communicating exact and sincere financial information, and its business ethics, for example by not using insider information to make profits. Two notorious sanctions illustrate that even the largest firms must communicate sincerely regarding their objectives, for example along merger and acquisition processes (SAN-2011-02 and SAN-2013-15). Another key element to bear in mind is that, during investigations of financial crimes, defendants (typically managers of large multinationals) can benefit from the protection of top-tier corporate attorneys and lawyers, with means by far exceeding the constrained budget of enforcement authorities. AMF workforce only amounted to 486 full time employees late 2021. This will end up dampening the probability of sanction, all other things kept equal. The complexity to file charges against high-level managers was illustrated in the U.S. in the aftermath of the subprime mortgage crisis. It was partly accounted for by the lack of resources and political will to prosecute either systematically important financial institutions or their leaders (Mayer et al., 2014). Another illustration of this asymmetry in means between the industry

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[46] Two sanctions of banks led to cumulated fines of 35 million (SAN-2017-07) and 37 million euros (SAN-2021-14). The fine for SAN-2017-07 was revised down to 20 million euros in appeal by the State Council in 2019. The sanction SAN-2021-14 was appealed. In 2023, a historic sanction (SAN-2023-01) was pronounced against an asset management firm and its two founding managers, leading to cumulated fines of 93 million euros, assorted with two blames and a five-year ban on activity.

[47] https://www.amf-france.org/fr/actualites-publications/prises-de-parole/13e-colloque-de-la-commission-des-sanctions-de-lamf-discours-de-cloture-de-robert-ophele-president.

and enforcers is the number of appeals: on average, each decision was appealed to 1.6 different courts. It is interesting to note a positive and statistically significant correlation between the top management conviction (or involvement in the procedure) and the appeal characteristics (probability of appeals and the number of appeals).

5.2 Acting independently from any external pressure

By law, the Enforcement Committee (in charge of the judgement) is statutorily independent from the AMF (in charge of the prosecution), which is an independent public authority. Still, it is worth stressing that the chairman of the AMF is named by Presidential decree, which could question the de facto independence of enforcement. De Batz (2020a) concluded that abnormal market reactions subsequent to sanctions of listed firms are not influenced significantly by the Chairmen of the AMF, nor by the Chairmen of the Enforcement Committee. Still, the tight (and typically French) connections between large corporations, the State, and the media regularly fuel suspicions of biases of some highly mediatized sanction decisions. The most notorious example was SAN-2009-33 against a highly-politically-connected multinational manufacturer. In fact, the AMF alleged insider trading and communication of false information in a context of major production delays, justifying the publication of a significant profit warning. The three mother companies of the manufacturer and numerous (17) top managers were in the end cleared from charges by the Enforcement Committee, which was a severe discredit of the AMF. There were also repeated information leakages along this enforcement procedure to top financial journals. The AMF had to communicate more than for any other sanction and suffered various types of pressure. For example, all members of the AMF board received direct communication from the incriminated firm before their decision to initiate a sanction procedure, a first time in history. Allegedly, foreign governments would also have tried to politically influence the verdict, given the multinational and partly State-owned nature of the firm. This led the chairman of the AMF to conclude this sanction procedure by: "there will be a before and an after".[48]

A milestone for the international credibility of the AMF enforcement was reached in 2016 with the judgement of European Court of Human Rights.[49] The Court considered unanimously that there was no reason to doubt the Enforcement Committee's and its rapporteur's independence from the other AMF bodies regarding a sanction for failing to comply with the rules on the period of cover for the short selling of stocks under a capital-raising program for a French listed firm (SAN-2008-21). The judgement also concluded that the applicable law at the relevant time was sufficiently foreseeable for the applicants to have known that their professional

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[48] https://www.lefigaro.fr/societes/2009/12/18/04015-20091218ARTFIG00424-jouyet-il-y-aura-pour-l-amf-un-avant-eads-et-un-apres-.php.

[49] Affaire X et Y c. France, n° 48158/11: https://hudoc.echr.coe.int/eng%23%7B%22fulltext%22:%5B%22amf%202016%22%5D,%22documentcollectionid2%22:%5B%22GRANDCHAMBER%22,%22CHAMBER%22%5D,%22itemid%22:%5B%22001-%20165754%22%5D%7D.

responsibility could be engaged if they purchased stock exchange rights without reasonably foreseeable cover right up to the end of the subscription period.

5.3 Encouraging best practices and healthy financial markets

Well-regulated and well-functioning financial markets contribute to their attractiveness. In that sense, enforcers have a major forward-looking role to play. Beyond the market abuses, they also contribute to guarantee the ethics of business to market participants, for example by fighting against money laundry and against financing of terrorism or weapons (see Table 3). It is interesting to note that four decisions sanctioned asset management firms which did not comply with the enforced rules regarding the fight against money laundering and terrorist financing (SAN-2009-22, SAN-2014-10, SAN-2021-05, and SAN-2021-17).

5.4 Keeping up with the industry: technological, legal, and financial innovations

Enforcement is constantly challenged by financial innovation. It fuels an "increasing complexity involved in financial market transactions as a result of rapid technological, legal, and financial innovation and an ever-widening menu of financial products" (Reurink, 2018; p. 1292). In the meantime, "an influx of unsophisticated, gullible participants in the financial marketplace", frequently with a video-game mindset, complexifies market surveillance (Reurink, 2018; p. 1292). This rise in neo-brokers has been fostered by the emergence of cheap and easy-to-use trading platforms, online chat rooms, social networks, and aggressive online marketing. Newcomers are allured with attractive promises of returns which fuels herd behaviors, in a context of historically low interest rates in Western economies followed by a massive reversal trend since early 2022 fueling uncertainties. The most notorious example happened in the U.S. with the massive trades on meme stocks like *Gamestop* in 2021, when individual investors were massively using complex financial instruments to speculate against hedge funds (Anand & Pathak, 2021). The multiplication of channels of communication mechanically complexifies the supervision and also poses challenges in terms of personal data protection.[50] Some authorities (Germany, U.K., and U.S.) have already initiated some investigations on the use of messaging platforms on personal phones in trading rooms, as a mean to circumvent controls for insider trading. The AMF recently sanctioned a Polish investment firm which used its passport to mis-sell financial products in France and advertised improperly in European standards using banners and *Google* adds (SAN-2021-16). This globalization trend of market participants underlines the key role that European Securities and Markets Authority (ESMA) has to play to guarantee a level playing field across Europe and limit regulatory arbitrage. In that sense, the repository of sanctions made

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[50] Typically What'sApp, Signal, or Telegram.

across the European Union, under the different Regulations and Directives, is very promising and calls for additional investigations.[51]

This complexity seems to be gaining traction with the combined effects of computer trading, of globalized markets, and of new (unregulated) investment vehicles with unregulated underlying assets (such as fungible and non-fungible tokens), as illustrate the spillovers of FTX collapse late 2022. Enforcers have to adapt proportionally and quickly to such innovations to protect investors. Still, enforcers are constrained by long legal and administrative processes, by limited means compared to the industry (computer, engineers, data, etc.), by the extraterritoriality of most of the new players, and by regulatory loopholes (new products might not fall into their rulebooks), etc. Some steps have already been taken, involving a reinforced cooperation between enforcers.[52] This stresses the need to invest in enforcement (careers, salaries, equipment, perspectives, etc.) in order to keep up with the industry, to be able to attract and retain top players from the industry,[53] and to contribute to regulate better their peers.

Finally, innovation also roots in the underlying assets. An example is agricultural commodities, illustrated by a sanction for price manipulation on the regulated derivatives market of MATIF Milling Wheat (No. 2) (SAN-2018-09). A more notorious example is the crypto assets, as the AMF has been a pro-active enforcer regarding crypto-assets and new market participants since mid-2018. The 2019 law PACTE offers the possibility to list as a digital assets services providers, on a voluntary basis. 56 did late 2022, while two were delisted late September 2022 (cessation of activity, non-compliance with the registration requirements). The AMF contributes to the international, European (Markets in Crypto-Assets Regulation), and French taskforces to set a general regulatory framework. The share of the alerts issued by the AMF regarding crypto-assets has been rising since 2018 to stand for 40% of the alerts issued in 2021. The AMF advises investors regarding their specific risks, and regularly updates a list of websites of unauthorized companies proposing atypical investments (in particular in asset assets) without being authorized to do so. For the first time in history, in November 2021, a sanction mentioned "crypto-currencies" (SAN-2021-16). The sanctioned investment firm breached the law when offering to its clients, on its website, contracts for difference (CFD) with Bitcoin and crypto-currencies as underlying assets.

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[51] https://registers.esma.europa.eu/publication/searchSanction.

[52] For example, the participation in the French taskforce on how to prevent scams launched in April 2020 (https://www.amf-france.org/fr/actualites-publications/actualites/anti-arnaques-lamf-participe-au-nouveau-guide-de-prevention-de-la-task-force-nationale), or the reinforced cooperation on the conduct of influencers regarding crypto-assets between the AMF and the Authority of Professional Advertising Regulation (ARPP) in July 2022 (https://www.amf-france.org/en/news-publications/news-releases/amf-and-arpp-are-stepping-their-cooperation-promote-clear-and-responsible-advertising-financial).

[53] The turnover of AMF employees is high (around 7% per year on historical basis) and rising (10% in 2021).

5.5 International level playing for globalized financial markets

Sanctions of French persons are long and complex procedures. The complexity is even greater when pursuing foreign persons acting cross-markets and cross-products. Enforcement procedures involving foreigners exceed by one year procedures involving French persons (lasting for 3.9 and 2.8 years respectively). Sanctions of foreigners have been enabled by the increasing international cooperation and exchange of
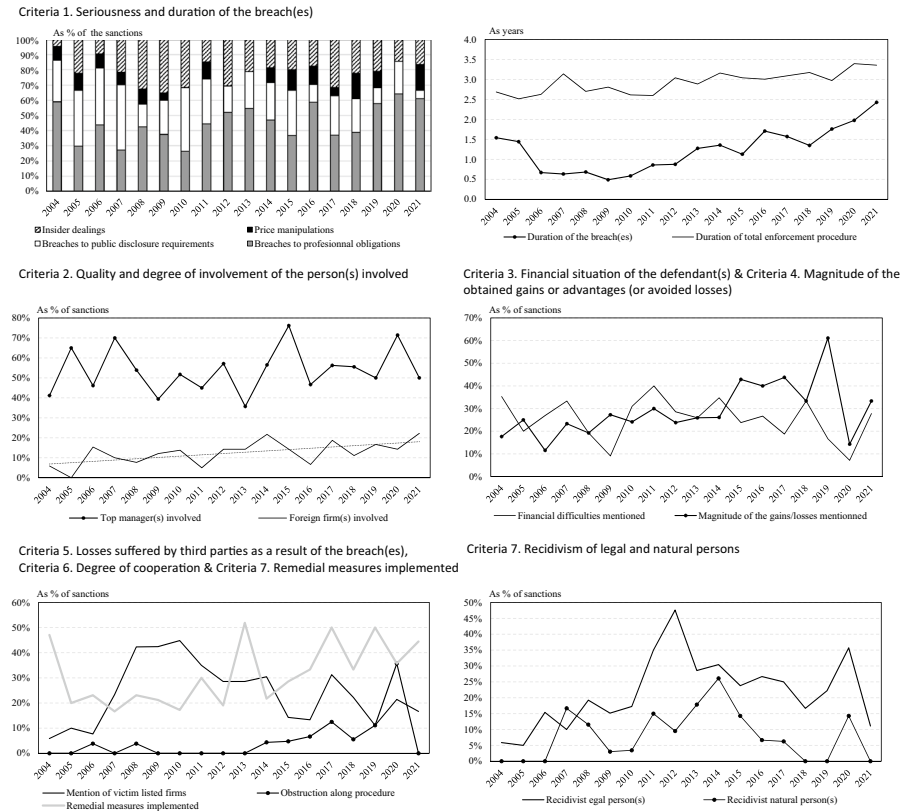

Fig. 7 Criteria to Set Sanctions. The figure details time developments of the variables defined to proxy the 7 criteria to set verdicts for the AMF Enforcement Committee, introduced in the law in 2016. They are averaged *per* year for the sample of 333 sanctions. They are ordered according to the law. Descriptive statistics are displayed in Table 5. *Sources*: AMF, Author's calculations (based on the publication year of the decision)

information agreements. The AMF has formalized 72 bilateral Memorandum of Understanding with 36 countries since 1992.[54] This enabled for example the two

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[54] By alphabetical order: Australia, Bahamas, Bermuda, Brazil, British Virgin Islands, Canada, Cayman Islands, China, Czechia, Egypt, Guernsey, Hong Kong, India, Isle of Man, Israel, Japan, Jersey, Lithuania, Malaysia, Mauritius, Morocco, New Zealand, North Macedonia, Poland, Qatar, Russia, Singapore,

sanctions of an asset management firm (the U.S. head company and its British subsidiary, both regulated by the U.S. SEC and the U.K FCA) in 2014 (SAN-2014-03 for insider trading) and in 2020 (SAN-2020-04, for late, false and incomplete communication, and obstruction). The fines respectively amounted to 16 and 20 million euros, the 3rd and 5th largest ever set by the AMF, but standing for less than 0.1% of the assets under management of the firm. These decisions were appealed for. The first one was confirmed, and the second one was marginally revised down to 18.5 million euros. Over the period under review, the share of procedures targeting foreign persons (12% on average) has been rising significantly (see Fig. 7), reflecting the globalization of financial markets, in particular within the European Union with a convergence of regulations but different intensity of enforcement (Cumming et al., 2018) and easier exports of financial services thanks to the European financial passport.

In the shorter term, another complementary tool regarding misdeeds of foreign market participants are the alerts. They enable raising concerns regarding a market participant at a low cost, but also possibly with a lower echo. On average, since 2010, 68% of the 194 AMF alerts targeted foreigners.

Finally, a critical aspect of enforcement to guarantee healthy and competitive financial markets and to enhance investor protection is the level playing field between jurisdictions, so that competitive financial sectors can reward the more efficient business models and avoid the risks of regulatory fragmentation. In that sense, the European convergence initiated in 2015 towards high standards with the Single Rulebook for European financial markets should contribute to attract investments. Late November 2021, the European Commission stressed that the finalization of a Capital Market Union is a key priority, to foster European attractiveness and to finance post-covid growth as well as the ecological and digital transitions. A convergence in oversight of financial markets and enforcement might limit regulatory arbitrage, with relocation of activities in a race-to-the-bottom enabled by the European passport of financial products, fragmentation with diverging interpretation and enforcement of rules to support the attractiveness and competitiveness of some countries *vis-à-vis* others, and in the end forum shopping. Regulations, instead of directives which have to be transposed nationally, also contribute to limit legal uncertainty. Still, the developments in the U.K. will have to be carefully monitored in the future.

Footnote 54 (continued)

South Africa, South Korea, Switzerland, Thailand, Turkey, United Arab Emirates, U.K., U.S.A., and Vietnam.

6 Translation of regulatory changes into the verdicts: retrospective criteria for fines

Sanction verdicts are guided by the financial laws enforced when the breach(es) are committed and by time-consistency. The cash fine is the most characteristic, straightforward, comparable, and publicized parameter of the verdicts, hitting the headlines of most of the economic and financial press when published. Hence, it is a key enforcement tool to punish and deter financial crimes. Still, French sanctions for financial crimes are said to be limited. Historically, the AMF Enforcement Committee was only subjected to guidelines on how to assess the amount, with upper limits for fines and time-consistency (Drumont, 2013). Enforcement by the AMF gained in transparency with the transposition of the European Market Abuse Regulation in December 2016 (see Table 3).[55] The Sapin II law formalized and enlarged these guidelines into the seven following criteria to be accounted for, according to the law ordering: (1) seriousness and duration of the breach(es); (2) quality and degree of involvement of the person(s) involved; (3) financial situation of the defendant; (4) magnitude of the obtained gains or advantages (or avoided losses); (5) losses suffered by third parties as a result of the breach(es); (6) degree of cooperation along the procedure; and (7) recidivism and remedial changes implemented. The first and fourth criteria were already included in the previous financial law. In this section, we thrill to exploit the exhaustive dataset of AMF sanctions between 2004 and 2021 to challenge whether any change is to be expected from the introduction of those seven criteria to set fines? Or, conversely, whether these criteria were in practice already accounted for by the Enforcement Committee when setting a fine?

6.1 Sample selection, methodology, and variables

6.1.1 Sample selection

To answer the research question, the dataset is limited to the guilty sanctions published by the AMF since 2004. Consequently, the 33 acquittal decisions are excluded, as they do not imply any cash fine and the defendants are cleared from charges. Conversely, the 16 guilty verdicts implying only behavioral sanctions are kept in the sample. The subsequent fines are set to zero. Additionally, 27 sanctions are excluded from the sample as the sanction reports do not specify the period when the breach(es) were committed. All in all, the sample is comprised of the 333 sanction decisions. Only 5 sanctions were made for breaches committed after the enforcement of the 2016 Sapin II law, which is unlikely to bias the results. For this sample, the average fine amounts to 1.1 million euros (median of 180,000 euros), ranging from zero (behavioral sanctions) up to 37 million euros.

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[55] Article L. 621-15 III ter of the Monetary and Financial Code (https://www.legifrance.gouv.fr/codes/article_lc/LEGIARTI000039261009/#:~:text=Version%20en%20vigueur%20depuis%20le%2024%20d%C3%A9cembre%202021&text=I.,contr%C3%B4le%20prudentiel%20et%20de%20r%C3%A9solution).

6.1.2 Methodology

We conduct a cross-sectional multivariate regression analysis to retrospectively investigate whether the fines set by the AMF Enforcement Committee were already determined by the legal criteria introduced by the Sapin II law. The following model is estimated using the usual ordinary least squares (OLS), with robust standard errors to control for heteroskedasticity:

$$Fine_i = \delta_0 + \delta_1 x_{i,1} + \delta_2 x_{i,2} + \cdots + \delta_n x_{i,n} + \mu_i, \quad E(\mu_i) = 0 \qquad (1)$$

where the dependent variable $Fine_i$ is the fine in euros, imposed for the sanction $i \in [\![1;333]\!]$, cumulated across sanctioned legal and natural person(s), as stated in the sanction reports; $x_{i,j}$ is the jth characteristics of the ith sanction, as described in Sect. 6.1.3, and δ_j are the $n+1$ parameters of the model, for $j \in [\![0;n]\!]$; and μ_i is the zero-mean disturbance term, uncorrelated with the explanatory variables $Fine_i$.

6.1.3 Variable selection

To proxy for the seven criteria introduced in 2016 to quantify fines, 17 explanatory variables were coded based on the information disclosed in the sanction reports, and complemented in some cases by regulatory information.[56] This set of variables was created to test the hypothesis about cross-sectional determinants of fines, implying that the criteria introduced late 2016 might have been guiding historically the fines set by the AMF Enforcement Committee. Such variables reflect both *ex ante* determinants of the magnitude of frauds and some decisions made by the defendants along the enforcement procedure (Files, 2012). For this exercise, no *ex post* information is used (such as behavioral sanctions, appeal information, length of the sanction reports, etc.), as the goal is to challenge the extent to which the newly introduced criteria were already driving the fines set by the AMF. The model cannot be used to predict fines, as key indicators were voluntarily not accounted for, typically variables unrelated to the 2016 enforcement criteria or inconsistent between sanctions, the most salient being the "size" of the regulated entities (such as the market capitalization or the assets under management). It is also worth stressing that defendants' size contributes to soften SEC verdicts on investments banks and brokerage houses and their employees (Gadinis, 2012) and lower reputational penalties (de Batz, 2020a). Tables 5 and 6 provide respectively descriptive statistics and the correlation matrix for those variables. Complementarily, Fig. 7 depicts graphically time developments of those variables.

First, three variables control for the seriousness and duration of the breach(es). Regulatory fines are expected to be positively associated with the seriousness

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[56] The author is aware of potential endogeneity concerns when modeling the relation between firm's action (such cooperation, disclosure, or remedial) and AMF actions (sanctions and penalties) in response to the alleged breach(es). But the objective is to challenge retrospectively the informational content of the legal criteria for fines and from this perspective potential causal link due to endogeneity seems immaterial.

Table 5 Descriptive statistics of variables

	Mean	Std. dev	Min	Max
Cash fines (in '000 EUR)	**1089**	**3674**	**0**	**37,020**
1. Seriousness and duration of the breach(es)				
Market abuse(s) sanctioned	0.57	0.50	0	1
Total proc. duration (in years)	2.93	1.06	0.96	8.96
Duration of the breach(es) (in years)	1.22	1.29	0.00	10.03
2. Quality and degree of involvement of the defendant(s)				
Top manager involved	0.55	0.50	0	1
Chief executive officer (CEO)	0.28	0.45	0	1
Managing director	0.19	0.39	0	1
Chairman	0.10	0.30	0	1
Founder involved	0.13	0.34	0	1
Main shareholder	0.19	0.39	0	1
Chief financial officer (CFO)	0.08	0.26	0	1
Foreign firm	0.13	0.34	0	1
3. Financial situation of the defendant(s)				
Mention of financial difficulties in the sanction report	0.28	0.45	0	1
4. Magnitude of the obtained gains/advantages				
Magnitude of the gains mentioned in the sanction reports (if any)	0.33	0.47	0	1
5. Losses suffered by third parties				
Victim firm(s) impacted by the breach(es)	0.26	0.44	0	1

Table 5 (contuined)

	Mean	Std. dev	Min	Max
6. Degree of cooperation along procedure				
Lack of cooperation, obstruction mention	0.05	0.21	0	1
7. Recidivism and remedial changes implemented				
Recidivist legal person(s)	0.23	0.42	0	1
Recidivist natural person(s)	0.09	0.29	0	1
Mention of implemented remedial changes	0.31	0.46	0	1

The table provides descriptive statistics for the 17 variables included in the model (1) (plus recidivism of natural persons for a robustness check displayed in Table 8) to explain the cash fines set by the AMF, based on the legal guidance developed along time and stated in the 2016 law, echoing both the practice and the literature. All these variables were coded based on the information disclosed in the sanction reports and complemented in some cases by regulatory information. For the 16 sanction decisions which only implied behavioral sanctions, the cash fines were set to zero. The sample is comprised of the 333 sanctions, which were not acquittal decisions (32 sanctions), for which the period when the breach(es) were committed were specified (exclusion of 26 sanctions), and which were published sanctions (2 specific decisions were excluded as they were an appeal of a ban on activity and a sanction withdrawn from the AMF website according to the appeal conclusion)

Sources: AMF, Author

Table 6 Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Market abuses	1																
2 Total proc. duration (in years)	0.15*	1															
3 Duration of the breach(es) (in years)	−0.41*	−0.01	1														
4 Top manager involed	0.26*	0.08	−0.08	1													
5 Chief executive officer (CEO)	0.31*	0.01	−0.05	0.57*	1												
6 Managing director	−0.04	0.01	0.06	0.42*	0.03	1											
7 Chairman	−0.15*	0.04	0.11	0.30*	−0.16*	0.05	1										
8 Founder involved	0.16*	0.02	0.02	0.36*	0.29*	0.11*	0.08	1									
9 Main shareholder	0.06	0.02	0.05	0.42*	0.33*	0.18*	0.21*	0.36*	1								
10 Chief financial officer (CFO)	0.11	0.07	−0.04	0.26*	0.15*	0.16*	0.10	0.06	0.10	1							
11 Foreign firms	0.21*	0.37*	−0.11*	−0.04	−0.05	−0.03	0.02	−0.05	−0.01	−0.01	1						
12 Mention of financial difficulties in the sanction report	0.08	0.00	0.03	0.31*	0.30*	0.05	−0.02	0.16*	0.13*	0.05	−0.06	1					
13 Magnitude of the gains mentioned in the sanction reports (if any)	0.29*	0.19*	−0.23*	0.11*	−0.01	−0.12*	0.10	−0.03	−0.01	0.12*	0.22*	−0.02	1				
14 Victim firms impacted by the breach(es)	0.33*	0.12*	−0.32*	−0.15*	−0.20*	−0.11	−0.03	−0.17*	−0.07	0.01	0.28*	−0.24*	0.32*	1			
15 Lack of cooperation, obstruction mention	0.04	0.11	0.06	0.11*	0.03	0.04	0.13*	0.04	0.12*	−0.01	0.09	−0.04	−0.03	0.00	1		
16 Recidivist legal persons	−0.07	0.17*	−0.01	−0.11*	−0.07	0.03	−0.06	−0.13*	−0.12*	−0.07	0.00	−0.06	−0.01	0.02	−0.01	1	
17 Mention of implemented remedial measures	−0.43*	−0.17*	0.34*	−0.19*	−0.15*	−0.03	0.05	−0.07	−0.09	−0.09	−0.14*	−0.12*	−0.21*	−0.30*	−0.08	0.00	1

The table displays the correlation matrix, for the 333 sanction decisions included in the sample, of the 17 variables, reflecting the practice and empirical research. Descriptive statistics are displayed in Table 5. The levels of correlation are satisfactory. It is worth stressing that—as expected—the strongest (and positive) correlations relate to the involvement of the top management of the firms and their functions

Sources: AMF, Author. N = 333; p < 0.05

and duration of the breach(es). (1) A dummy variable is set to one for sanctioned market abuses, and zero otherwise, following the AMF classification of sanctions (see Table 1). Market abuses are deemed more serious than breaches of professional obligations. On average, 1.3 types of breach were sanctioned *per* decision, and 57% of the decisions involved market abuses. (2) A complementary measure of the seriousness of the breach(es) is the total duration of enforcement procedure, measured as the years elapsed from the ignition of the investigation or control until the publication of the sanction (2.9 years on average, ranging from 1 to 9 years, see Fig. 5 and 7). This measure reflects the complexity of the case, the legal uncertainty, and possibly defendants' legal attempts to slow down the enforcement process. (3) The duration of the breach(es) is constructed as the number of years between the beginning and the end of the breach(es), according to the information disclosed in the sanction reports. The breach(es) lasted on average 1.2 years, ranging from 1 day up to 10 years, far less than the duration of cartels (7 years on average for the cartels sanctioned in Europe between 1975 and 2009, according to Combe and Monnier (2011)).

Second, a set of 8 dummy variables controls for the quality and degree of involvement of the defendant(s) in the breach(es). Seven of them focus on the top management, as opposed to employees or individual investors. The negative spillovers of the managers' involvement in fraud is developed a rich literature. Jory et al. (2015) stressed that organizations run by unethical managers can pose a threat on investors' wealth. Fraud revelation will also penalize managers' reputation due to the lost trust in management (Cianci et al., 2019). In addition to the direct costs of sanctions, fraud revelation can fuel higher top management turnover (Agrawal et al., 1999; Hennes et al., 2008), and losses of board directors (Street & Hermanson, 2019). For the AMF sample, the top management is involved in 55% of the sample, respectively with CEOs (28%), managing directors (19%), chairmen (10%), founders (13%), main shareholders (19%), and CFOs (8%). The underlying assumption is that the top management's guilt in committing a financial crime reflects their inability and/or unwillingness to abide the set of rules they are subjected to (Loyeung & Matolcsy, 2015). Consequently, fines are expected to be higher, all other things kept equal. The last dummy controls for the involvement of foreign firms in the breach (13% of the sample). Given the higher complexity of pursuing a foreign legal person, the need for time-consuming international cooperation, and the lower probability that the sentence will be duly enforced, it is assumed that only the most serious alleged breach(es) involving foreign firms will be prosecuted and possibly sanctioned, leading to higher cash fines. Less serious alleged financial crimes involving foreign firms will be either notified to the AMF's foreign counterparts, abandoned, or notified to the markets by issuing an alert.

Third, the financial situation of the defendant(s) has to be considered, as fines should reflect the defendant's financial capacity, hence ability to pay. The ultimate goals of enforcement are to punish, to show example, and to deter future crime, not to lead firms into bankruptcy. Consequently, a dummy variable is set to one when the sanction report explicitly mentions financial difficulties of the defendant(s), relevant for 28% of the sample. This variable is expected to moderate the fines set by the

Enforcement Committee (negative coefficient), though it is worth bearing in mind that the poor financial conditions of firms could also drive them to border-line to illegal behaviors.

Fourth, the regulatory fines are expected to reflect positively the magnitude of the obtained gains or advantages (or avoided losses). This directly echoes one of the three parameters justifying a crime in Becker's (1968) model of crime: the expected benefits from committing a crime. A dummy is set to one when there is an explicit estimation of the magnitude of those gains/advantages/avoided losses in the sanction report (33% of the sample). Such gains result from market abuses at the expense of the market: use of insider information, price manipulation, or publication of false financial information. We preferred the dummy to the cash value of obtained gains (or avoided losses), which is complicated to compare between breaches (balance sheet impact, profits or avoided losses from insider trading, and gains from price manipulations, etc.) and between persons.

Fifth, the losses suffered by third parties as a result of the breach(es) are proxied with a dummy set to one when the breach was committed at the expense of a listed firm, as in de Batz (2020b). A firm can be the victim of others' financial crime typically when its stocks are manipulated or when insider information is used at its expense. 26% of the sanctions in the sample involved such victims. This variable is expected to be positively correlated to the fines.

Sixth, the degree of cooperation along the procedure is controlled for with a dummy variable set to one when there is an explicit mention of lack of cooperation and of obstruction from the defendant(s), which is relatively rare (5% of the sample). Echoing the conclusions of Files (2012) on the enforcement SEC's leniency following a restatement, we expect that cooperation and forthright disclosures are rewarded through lower monetary penalties. Inversely, the variable should be positively associated with the cash fines.

Seventh, dummy variables also control for recidivism and implemented remedial measures. Two dummy variables are created regarding the recidivism of legal and natural persons, set to one when the person gets sanctioned at least for the second time (hence being by construction positively correlated with time). Legal and natural persons might have strong incentives to limit the information they disclose about their misconducts, and the subsequent signals might differ by types of persons (Carberry et al., 2018). Investor's expectations will also differ depending on their expectations regarding the likelihood that the legal and natural persons will misbehave again in the future (Connelly et al., 2016; Karpoff, 2012). Additionally, another dummy variable is set to one when there is an explicit mention of the implementation of remedial measures in the sanction report. By doing so, the firm acknowledges the alleged failures and takes subsequent actions at the benefit of investors. Recidivism and remedial changes are expected to have opposite influences on the fines. On the one hand, recidivism means that a person breaches more than once the set of rules it is subjected to, implying potentially higher reputational costs for repeat offenses (Amiram et al., 2018; Karpoff & Lott, 1993). Consequently, the verdict for repeat offenders is expected to be tougher. For the sample of AMF sanctions, recidivism is much more frequent for legal persons than for natural persons (respectively 23% and 9% of the sample). Legal persons were sanctioned up to 12

times since 2004. On the other hand, remedial changes subsequent to enforcement procedures are a positive signal sent by the defendant(s), which should moderate the fine. Several factors support this leniency, as it can contribute to mitigate the damage from the breach(es) (Hennes et al., 2008; Karpoff et al., 2008), to restore confidence among stakeholders, and in the end to benefit investors (Jory et al., 2015). Still, remedial measures come at a cost due to the replacement or hiring of employees, investments to improved processes and monitoring, etc., as stressed by Alexander (1999).

6.2 Results on the legal determinants of fines

New evidence on the criteria accounting for the severity of the verdict of the sanctions set by the AMF since 2004 are reported in Table 7. The baseline model [1] presents the multivariate OLS regression results of the estimation of Eq. (1) with the cash fines as the dependent variable and the 17 explanatory variables, based on the AMF practice and on the literature. Those variables parallel the 7 criteria stated in the 2016 Sapin II law as guidelines to set verdicts. Complementary, model [2] is the reduced version of Eq. (1), limited to the 7 variables which exhibit statistically significant paired relationships.[57] Both models provide consistent results in terms of the directions and magnitudes of coefficients. They are also consistent with the expected reactions, to harden or soften verdicts. Such results support the hypothesis that the formalization of criteria to set fines in the 2016 law reflects mostly criteria de facto already accounted for, with some room for improvement.

First, regarding the two criteria preexisting to the 2016 law, the results confirm that two variables contribute statistically significantly to increase the fines set by the Enforcement Committee, all other things kept equal: more serious breach(es), *i.e.* market abuses as opposed to other breaches of professional obligations, and the mention of the obtained gains/advantages (or avoided losses). They count among the most important predictors of the magnitude of the cash fines. Conversely, the durations of the enforcement procedure and of the breach(es) turn jointly insignificant. The coefficients are more limited though positive as expected, implying that they do not serve as a signal of the seriousness of the breach(es) (model [1]). Still, the paired relationship between the fines and the duration of the procedure is statistically significant, hence supporting its inclusion in the reduced model [2]. When winsorizing fines (model [3]), this variable becomes statistically significant with the expected positive sign. Hence, longer procedures reflect to some extent more serious breach(es).

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[57] For the sake of readability of Table 7, the paired results are not displayed but are available upon demand.

Table 7 Results of OLS models on the determinants of cash fines

	Baseline model [1]		Reduced model [2]		Cash fines winsorized (5%) [3]		Cash fines (> 0) [4]	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
1. Seriousness and duration of the breach(es)								
Market abuse(s) sanctioned	1789*	2.02	864*	2.34	321*	2.54	887*	2.30
Total proc. duration (in years)	177	1.14	212	1.35	307**	2.89	222	1.38
Duration of the breach(es) (in years)	434	1.66						
2. Quality and degree of involvement of the defendant(s)								
Top manager involved	− 631	− 1.28						
Chief executive officer (CEO)	− 359	− 0.92						
Managing director	364	1.03						
Chairman	− 394	− 1.07						
Founder involved	− 230	− 0.77	− 207	− 0.86	21	0.01	− 214	− 0.87
Main shareholder	266	0.74						
Chief financial officer (CFO)	638	1.4						
3. Financial situation of the defendant(s)								
Foreign firms	2817**	2.72	2741**	2.71	910**	3.11	2710**	2.67
Mention of financial difficulties in the sanction report	− 726**	− 2.74	− 799**	− 3.07	− 345***	− 3.14	− 846**	− 3.11
4. Magnitude of the obtained gains/advantages								
Magnitude of the gains mentioned in the sanction reports (if any)	978*	2.11	593	1.46	414**	2.79	573	1.37
5. Losses suffered by third parties								
Victim firms impacted by the breach(es)	− 601	− 0.86						
6. Degree of cooperation along procedure								
Lack of cooperation, obstruction mention	676	0.69						

Table 7 (continued)

	Baseline model [1]		Reduced model [2]		Cash fines winsorized (5%) [3]		Cash fines (> 0) [4]	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
7. Recidivism and remedial changes implemented								
Recidivist legal persons	1642*	2.2	1589*	2.13	394*	2.49	1623*	2.12
Mention of implemented remedial measures	519	0.94						
Constant	**−1538***	**−2.16**	**−700**	**−1.74**	**−384***	**−2.03**	**−712**	**−1.71**
R^2	0.22		0.18		0.28		0.18	
Adj. R^2	0.18		0.16		0.27		0.16	
F	2.14		3.16		8.23		3.07	
Prob>F	0.01		0.00		0.00		0.00	
Sample size	333		333		333		317	

The table presents the cross-sectional multivariate OLS regression results for the estimation of Eq. (1), with robust standard errors with a Huber–White correction, to control for heteroskedasticity. Robust t-statistics are calculated from the cross-sectional standard error of fines. Total cash fines imposed *per* sanction are the dependent variable. The results for the baseline and reduced (only statistically significant variables with paired relationships) models are displayed in columns [1] and [2], with robust standard errors. The 17 explanatory variables are dictated by the practice and the literature (Detailed results for the paired regressions are not reported for the sake of readability of tables but are available on demand). The descriptive statistics are displayed in Table 5. The sample is comprised of the 333 sanctions, which were not acquittal decisions (33 sanctions), and for which the period when the breach(es) were committed were not specified (27 sanctions). As robustness check of the sensitivity of the results to the tougher decisions, the model was re-estimated with one-sided winsorized cash fines, referring only to the tail with the highest values. Results are displayed in column [3] for the 5% winsorization. Complementarily, as robustness check to the sensitivity of the results to the lighter decisions (understood as the 16 decisions only assorted with behavioral sanctions, or put it differently with a null cash fine), the model was re-estimated without those decisions (column [4])

Sources AMF, Author

*p<0.05; **p<0.01; ***p<0.001

Second, regarding the five newly introduced criteria, three aspects turned out to statistically significantly influence the verdicts, with the expected signs: (1) the involvement of foreign firms, with the largest magnitude, hinting that the AMF might only focus on the most serious alleged breach(es) involving foreign firms, with the highest probability to be sanctioned; (2) the fact that the defendant is in poor financial condition, mitigating the fines set; and (3) the recidivism of legal persons, contributing to a great extent to the severity of the verdicts.

Conversely, all the variables but one controlling for the top management's involvement in the breach(es) and their specific positions turned insignificant. These insignificances could be due to the fact that, as investors, enforcers react more negatively when the corporation is blamed, as opposed to executives or employees (Carberry et al., 2018). The significantly higher upper limit of fines for firms than for individuals could also be accounted for, a hypothesis dug into as a robustness check. The only significant paired relationship is when founders are investigated, with a mitigating impact on fines. But the partial relationships turned insignificant. This result on founders echoes the specificity of founders in an organization stressed by Leone and Lui (2010) on U.S. data. Board's response to accounting irregularities differs when the CEO is a founder, being significantly less likely to be fired. Firing executives is a way to restore corporate reporting credibility, but replacing founders is generally costlier.

Finally, the last three criteria formalized with the 2016 law did not, retrospectively, influence the fines, despite being mentioned in the sanction reports since 2004: the mention of victims of the breach(es); the defendant's lack of cooperation or obstruction during the enforcement procedure; and the mention of remedial measures implemented by the defendant(s). First, regarding the victims, it is possible that this variable imperfectly proxies the losses suffered by third parties, as it only focusses on one category of legal person and overlooks individual investors. Second, from an enforcement perspective, it is striking that the lack of cooperation from the defendant(s) (or even obstruction) and the implementation of remedial measures by the defendant(s) did not significantly impact the verdicts on a historical basis. No future change can be forecasted for the (rare) obstruction allegation during the enforcement procedure, as the AMF lost its power to sanction this breach in 2022, at the benefit of criminal courts (see Table 3). An upside could come from defendant's active cooperation along enforcement procedures, as a strategy to mitigate verdicts. Another venue could be the introduction of a formal leniency program for financial crimes at the European or French level, as done for cartels. The European Commission instated in 1996 a leniency program thanks to which companies that provide sufficient information about a cartel in which they have participated may receive full or partial immunity from fines. Leniency programs could contribute to a quicker and cheaper detection of financial crimes, leading to a more efficient enforcement. Third, the insignificance of the positive signal sent by defendant(s) when implementing remedial measures (mentioned in a third of the sanction decisions) might result from the measure included in the model. Kirat and Marty (2015) stressed that remedial changes justified more and more frequently the enforcement decisions over the early 2010s. Mentions to remedial changes have plateaued since then, being mentioned in 40% of sanctions. The dummy variable—set to one if some remedial measures were

implemented and zero otherwise—neglects the nature of the measures and their pro-portionality to the alleged breach(es). Based on the sanction reports, it is impossible to quantify in absolute and with respect to the magnitude of the breach(es) the investments made by the defendant(s), nor to compare such investments between procedures. Looking forward, it is possible that the regulatory change enforced in 2016 clearly stating criteria to be accounted for when setting the verdict will both encourage defendant(s) to invest more on remedial measures during the enforcement process—to mitigate their fines—and push the Enforcement Committee to account more significantly for those efforts when setting their verdicts. In parallel, the remedial measures subsequent to settlements might also raise the awareness of regulated persons and push for more remedials along enforcement procedures.

All in all, those results demonstrate that the majority of the seven 2016 criteria were already accounted for by the Enforcement Committee on a historical basis. Four criteria (two of which introduced in 2016) contribute to greater fines: foreign firms, market abuses, recidivism, the mention of gains subsequent to the breach(es). Conversely, the poor financial situation of the defendant tends to curb fines. Still, our models fail to conclude with a significant impact on the verdicts of the other newly introduced criteria: the quality and degree of involvement of the defendant(s), proxied with the involvement of the top management of the firms; the fact that the breach(es) were committed at the expense of others; the lack of cooperation; and the implementation of remedial measures. This could be partly explained by the choice of variables. Still, there may be room for improvement to better account for those criteria. Defendant(s) appear to have lever to loosen verdicts by cooperating more along enforcement procedures and by implementing remedial measures. Conversely, the Enforcement Committee could better consider the duration of the breach(es), the quality and degree of involvement of the defendant(s), and the loss(es) suffered by third parties. Should they be more accounted for by enforcers and defendant(s), the spillovers of enforcement procedures and the exemplarity of sanctions would become greater.

6.3 Robustness checks and limitations

In order to strengthen the validity of our results, we conduct three sets of robustness checks.

First, we challenge the robustness of the results to the presence of outliers. In order to control for historically high fines (Files, 2012), we winsorize the highest cash fines. Model [3] in Table 7 displays the results of the reduced Eq. (1) for the 5% level of winsorization.[58] The signs of coefficients are consistent across winsorization levels with the initial results, and the magnitudes come closer to the initial magnitude with lower levels of winsorization. This demonstrates that the presence of outliers is not likely to have a disproportionate effect on our outcomes. Conversely, to control for verdicts only assorted with behavioral sanctions, implying a null cash fine, model [4] in Table 7 re-estimates the reduced Eq. (1) for the subsample of sanctions with cash fines (317 sanctions). The results are also consistent in magnitude and signs with the original sample.

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[58] Complementary and consistent results for the 1%, and 10% levels are available upon request.

Second, we investigate the impact of the nature of the sanctioned persons (legal or natural) on fines, as they are subjected to different upper limits. On average, for the sample, 2.3 persons are sanctioned *per* decision (1 legal person and 1.3 natural persons), while 0.5 person is cleared from charges (0.1 legal person and 0.4 natural person). As in Files (2012), the reduced model is re-estimated for two subsamples: the 260 sanctions involving legal persons, and the 222 involving natural persons. In addition, we use three measures for the dependent variable in Eq. (1): (1) the total cash fine imposed by sanction (as in the original model), (2) the total cash fine imposed on legal (or natural) person(s), and (3) the average cash fine *per* sanctioned legal (or natural) person (see Fig. 4C).[59] Finally, we use specific recidivism measures for each population, as legal persons are much more prone to be repeatedly caught breaking the law than natural persons (23% and 9% of the sample respectively). The results are displayed in Table 8 and call for the following observations. The results for the full sample are confirmed across the board regarding the more severe breach(es) (market abuses translate into higher fines) and the mention of financial difficulties (softer verdicts). The penalty for being a foreigner is significantly driven by legal persons. Conversely, and contrary to the results for the full sample, mentions of the obtained gains or advantages (or avoided losses) and—to a lower extent—longer procedures contribute to significantly greater fines for natural persons, according to the expectations. Additionally, the paired relationships between the fines on natural persons or the fines *per* sanctioned natural person and the involvement of top managers turns positive and statistically significant. Finally, recidivism does not significantly influence fines, though the signs of coefficients are positive as expected. No conclusion could be drawn for more granular analyses by persons, for example by splitting the sample by types of investigated legal persons (29% of sanctions involving listed firms, 25% asset management firms, 21% private firms, and 10% investment firms), possibly due to the small sample sizes.

Third, for the sake of exploring all possible venues of relevant research, we perform additional robustness checks investigating the time dimension by distinguishing sanctions depending on the laws enforced when the breaches were committed. This is supported by the rising trend in fines over time (see Fig. 4A–C) and by the three increases in upper limits for fines. Still, the dummy variables for the consecutive financial laws are insignificant paired determinants for the fines. We also re-estimate the Eq. (1) by subsamples according to the financial law enforced when the breach(es) was committed. These analyses bring limited additional information (hence not reported), possibly due to the limited sample sizes, except regarding recidivism. In fact, recidivism becomes more statistically significant and to a greater extent positively correlated to the cash fines over time. This is consistent with the construction of the dummy which is set to one for sanctions involving persons sanctioned at least for the second time. Repeat offenders pay a higher price for cheating the law. Therefore, the fines do not appear to be driven by the laws enforced, which further support the fact that the AMF has been accounting for the majority of the 7 criteria along its history, regardless of the financial laws enforced.

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[59] Results are available upon request.

Table 8 Results of OLS models on the determinants of cash fines by sanctioned persons

| | A. Sanctions on legal persons | | | | | | B. Sanctions on natural persons | | | | | | C. Full sample | |
| | Total cash fines per sanction [1] | | Total fines imposed on legal persons [2] | | Fine per legal person sanctioned [3] | | Total cash fines per sanction [1] | | Total fines imposed on natural persons [2] | | Fine per legal person sanctioned [3] | | | |
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
1. Seriousness and duration of the breach(es)														
Market abuse(s) sanctioned	1239**	2.66	975*	2.13	823	1.91	395**	2.72	191	1.94	121*	2.57	864*	2.34
Total proc. duration (in years)	243	1.23	72	0.43	−7	−0.06	335*	2.31	206*	2.56	45	1.26	212	1.35
2. Quality and degree of involvement of the defendant(s)														
Founder involved	−512	−1.71	−534	−1.94	−396*	−2.09	−178	−0.69	52	0.33	168	1.76	−207	−0.86
Foreign firms	2803*	2.21	2740*	2.16	1435*	2.03	2714	1.83	1010	1.93	509*	1.97	2741**	2.71
3. Financial situation of the defendant(s)														
Mention of financial difficulties in the sanction report	−1044**	−3.04	−931**	−2.86	−666**	−2.74	−659**	−2.71	−285*	−2.06	−161*	−2.2	−799**	−3.07
4. Magnitude of the obtained gains/advantages														
Magnitude of the gains mentioned in the sanction reports (if any)	1024	1.81	702	1.26	257	0.72	522*	2	397**	3.07	231**	3.2	593	1.46
7. Recidivism and remedial changes implemented														
Recidivist legal persons	1402	1.69	1515	1.82	1076	1.66							1589*	2.13
Recidivist natural persons							3	0.01	661	1.45	229	1.01		
Constant	**−727**	**−1.49**	**−300**	**−0.73**	**39**	**0.14**	**−629**	**−1.55**	**−534***	**−2.31**	**−126**	**−1.15**	**−700**	**−1.74**
R²	0.19		0.1568		0.11		0.1721		0.2366		0.1889		0.18	
Adj. R²	0.168		0.133		0.085		0.145		0.212		0.162		0.16	
F	2.93		2.07		0.02		2.57		3.67		3.34		3.16	

Table 8 (continued)

Constant	−727	−1.49	−300	−0.73	39	0.14	−629	−1.55	−534*	−2.31	−126	−1.15	−700	−1.74
Prob>F	0.0058		0.0469		0.02		0.0144		0.0009		0.0021		0.00	
Sample size	260		260		260		222		222		222		333	

The table presents the results of cross-sectional multivariate OLS regressions estimating the reduced Eq. (1), with robust standard errors. The explanatory variables are limited to the statistically significant variables with paired relationships for two subsamples depending on the sanctioned persons: the 260 sanctions of legal person (sample A) and/or the 222 sanctions of natural persons (sample B), compared to the full sample (sample C). For each sample, three dependent variables are compared: [1] the total cash fine for each sanction, [2] the total cash fine imposed on legal/natural persons, and [3] the cash fine *per* legal/natural person sanctioned

Sources: AMF, Author

* p<0.05; **p<0.01; ***p<0.001

Finally, additional *ex ante* explanatory variables for the 7 criteria were envisioned, capitalizing on the richness of the dataset, but in the end were not included in the model due to their meaninglessness. First, the number of breaches notified to the defendant(s) (3.9 on average, ranging from 1 to 29) is a misleading proxy for the seriousness of the breach(es), contrary to being a market abuse. In fact, numerous small breaches to professional obligations can be notified to small investment firms or investment service providers,[60] leading in the end to low fines, in sharp contrast with one severe insider trading allegation. Second, an alternative indicator for the seriousness of the breach(es), or for losses suffered by third parties, is the fact that the enforcement procedure was initiated by an outsider complaint, which is rare (3.6% of the sample) and also turned insignificant. Third, the sectors of activity were envisioned to proxy recidivism, as financial institutions, involved in a fifth of the sample, are the first repeat offenders. Still, the variable recidivism was preferred in the model to the dummy for financial institutions, as it is the explicit criterion by law, and as this variable is also strongly positively and significantly correlated with being a financial institution. Fourth, the involvement of the auditing firms—being incriminated or sanctioned for breach(es) together with the firms which accounts they certify (standing respectively for 6.6% and 2.4% of the sample)— does not impact the fines (with a small sample size). This result contrasts with the literature which typically conclude with large reputational costs to auditing firms involved in financial crimes (Agrawal & Cooper, 2017; Coffee, 2001; Francis, 2004; Guy & Pany, 1997).

7 Concluding remarks

This article is both a retrospective and a prospective analysis of financial crimes, based on a comprehensive and up-to-date review of French enforcement actions since its creation in 2003. The three main levers at the French Financial Market Authority's disposal are analyzed: sanctions, settlements, and alerts. The last two levers were introduced respectively in 2012 and 2010, to ease enforcement and to speed up regulatory communication with market participants. Conversely, some steps have been taken towards less transparency, most notably with the retroactive anonymization of a large share of sanctions. This anonymization contributes to the value of the exhaustive dataset on which this article is based. Sanction decisions appear to have become more severe over time when measured with fines—echoing consecutive regulatory reforms which reinforced the AMF's powers—at the expense of longer prosecutions.

This article also examines the rising complexity of information acquisition from an enforcement perspective based on the AMF enforcement history. Beyond the diversity of market participants to supervise, from traders and shareholders to analysts and journalists, technological, legal, and financial innovations, and the globalization of financial markets further challenge enforcement. This results in increasingly sophisticated, complex, and fast financial transactions, in a diversification of market

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[60] Such as inappropriate organization or insufficient means at the expense of investors (for example not recording phone calls with clients, not having two managers, inappropriate management of conflicts of interests, etc.).

participants, and in an explosion of the volume of information spread through more and more different channels. Our study suggests that enforcers' credibility needs to be supported with investments (technology, human resources, and communication) in order to keep up with the industry and to efficiently deter financial crimes. Up-to-date, timely and commensurate regulatory reforms are also crucial for a sound financing of economic growth without dampening the attractiveness of a stock exchange.

Complementarily, the AMF enforcement gained in transparency when transposing of the Market Abuse Regulation in 2016, with the introduction of seven criteria to set sanction verdicts. The results of econometric estimations stress that, though the majority of those criteria was de facto already accounted for by the Enforcement Committee, there is room for improvement. Defendant(s) could use levers to soften verdicts by cooperating more with the AMF along enforcement procedures and by implementing remedial measures. Conversely, the Enforcement Committee could better consider the duration of the breach(es), the involvement of the management of the firms, and the loss(es) suffered by third parties.

This empirical analysis contributes to gaining a deeper understanding of the complex relationships between the characteristics of the offenders and of the financial crimes and the subsequent expected punishment for a civil-law European country. It is critical to promote more ethical corporate and individual behavior and to protect investors efficiently. This synthesis of the AMF history of enforcement decisions calls for complementary work. Firstly, it would be interesting to deeper analyze the dataset to address partial observability, to better assess the number of wrongdoers who evaded capture, or whether enforcement actions are deterring persons from engaging in financial crimes, for example using capture-recapture methods. Additionally, complementary investigations could be conducted to build a predictive model for sanction verdicts, adding more criteria than those disclosed by the AMF in sanction reports echoing the 2016 law. Finally, this article should be complemented with a similar work from a European perspective in order to obtain results based on regional comparisons, in a context of convergence of regulations, possibly exploiting the ESMA data.

Data availability The dataset generated during the current study is not publicly available as it contains confidential regulatory information (names of the sanctioned persons and/or victims and dates of the enforcement procedures). Hence, partial restrictions apply to the availability of these data. Information on how to obtain it and reproduce the analysis is available from the corresponding author on request.

Declarations

Conflict of interest No competing interests are directly or indirectly related to the work submitted for publication.

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