

# Privatizing Plaintiffs: How Medicaid, the False Claims Act, and Decentralized Fraud Detection Affect Public Fraud Enforcement Efforts

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## Abstract

Decentralized fraud enforcement, compensated on a contingency basis, supplements fraud enforcement agency efforts without increasing spending. In 2016, decentralized enforcement under the False Claims Act (FCA) recovered \$2.5 billion spent on healthcare fraud. The FCA induces private citizens to pursue civil fraud claims on behalf of both themselves and the government, or *qui tam*; incentives to pursue legal action for Medicaid fraud vary at the state level. We hypothesize agencies shift fraud enforcement strategies as incentives for private citizens to monitor civil offenses rise. We find state-level FCAs did not increase the number of filed *qui tam* suits as incentives rose. Among filed cases, case quality did not change. Instead, agencies pursued fewer civil cases and case length increased. Our findings suggest potential *qui tam* plaintiffs are constrained by an ability to pursue cases, not incentives. Government-led civil fraud enforcement reductions may thus overestimate the capacity to decentralize fraud enforcement.

# 1 Introduction

Government programs are susceptible to fraudulent contractor behavior because resources to investigate fraud within these large-scale programs are limited. This dynamic is exacerbated in the healthcare setting due to fundamental information asymmetries regarding the necessity for and receipt of services.<sup>1</sup> Decentralized fraud enforcement, compensated on a contingency basis, supplements fraud enforcement agency efforts without increasing spending. The federal False Claims Act (FCA) and complementary state-level FCAs are the primary policy mechanisms used to induce private citizens to pursue fraud claims on behalf of the government, or *qui tam*.<sup>2</sup> Whether such decentralization unburdens fraud enforcement agencies by incentivizing effective prosecution of legitimate cases of fraud or exhausts agency resources via pursuit of specious claims depends on the magnitude of the incentives and the ability of individuals to identify and pursue cases of fraud. In this paper, we examine the effects of state-level incentives to file *qui tam* suits on the characteristics of filed cases and on state-level fraud enforcement efforts. We find empirical evidence that high incentives to pursue civil fraud do not increase the number of cases or affect the overall quality of filed *qui tam* cases, but do increase the case length. We also find that, among state-level fraud enforcement agencies, higher incentives to decentralize fraud enforcement result in fewer filed civil cases.

Healthcare fraud<sup>3</sup> is a pressing government issue at both the federal and state level. Estimated improper Medicaid and Medicare payments, which include payments due to fraud, indicate high potential returns on fraud enforcement: \$54 billion in Medicare in 2014 (Hill et al., 2014) and \$61 billion in Medicaid (CMS, 2016).<sup>4</sup> Reducing fraud, waste,

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<sup>1</sup>In addition to information asymmetries, differential views and social norms of physicians, program administrators, fraud control personnel, and the public complicate agreement on how to address healthcare fraud (Hyman, 2001; Rai, 2001).

<sup>2</sup>*Qui tam* is a legal phrase short for *qui tam pro domino rege quam pro se ipso in hac parte sequitur*, meaning “he who brings a case on behalf of our Lord the King, as well as for himself”. The government, not the private citizen, is considered the true plaintiff. This is also called a “popular action”. *Qui tam* plaintiffs, as we call them in this paper for the sake of clarity, are generally called “relators” in legal jargon.

<sup>3</sup>The term “fraud” is not used to denote a specific loss of social welfare; rather, we use the term in context of behaviors that legally constitute fraud.

<sup>4</sup>These estimates are fairly conservative; Morris (2009) cited estimates of up to \$250 billion in fraud-

and abuse within the Medicaid program is particularly important for state and federal governments, which jointly fund Medicaid. In 2016, the Department of Justice (DOJ) obtained more than \$2.5 billion in settlements and judgments from healthcare fraud and false claims cases alone (Department of Justice, 2016). While this amount is large in absolute terms, the even larger difference between estimated fraud costs and recoveries suggests substantial potential gains from identifying how to encourage the report and prosecution of healthcare fraud.

Since the federal FCA's most recent overhaul in 1986, the focus of pursued cases under the FCA has shifted from defense contracting to healthcare fraud (Rountree Jr, 1999; Callahan and Dworkin, 2000) and has increased the number of *qui tam* cases from fewer than ten per year to more than 400 cases across all areas of spending, such as defense, finance, and healthcare (Barger Jr. et al., 2005). In 2006, via the Deficit Reduction Act (DRA), the federal government entitled states with state-level FCAs that contained provisions to encourage *qui tam* lawsuits to a larger share of settlements. Following the DRA, some states implemented these provisions in order to obtain a larger share of recovered funds.

We study the effect of state-level FCAs on filed *qui tam* cases from 2004 to 2016, as well as their effect on Medicaid fraud enforcement efforts made by designated state agencies (MFCUs) from 2010 to 2016. In addition to the estimated prevalence of fraud within the Medicaid program, Medicaid is an ideal setting to study public agency responses to decentralized fraud enforcement because both centralized fraud enforcement efforts and incentives to promote decentralized fraud enforcement vary substantially at the state level.<sup>5</sup> Currently, 37 states and Washington, D.C. have FCAs that employ civil penalty provisions; 31 states and Washington, D.C. employ civil penalty provisions and *qui tam* provisions; and 13 states do not have an FCA at the state level. Variation in the adoption

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related spending, as of 2009.

<sup>5</sup>Nationally, in 2016, \$258 million was spent on fraud enforcement (Office of Inspector General, 2016). The highest level of state spending was more than 100 times the amount spent in the lowest state (New York, \$47 million,; versus South Dakota, \$438,342). Program size, in terms of the number of participating providers and enrolled beneficiaries, accounts for 70% of the observed variation in enforcement spending (Authors' own analysis of the data).

timing of incentives to decentralize fraud enforcement creates heterogeneity in the relative benefits and costs of civil cases over the study period. Since Medicaid fraud is coordinated at the state level, we are able to leverage this variation to examine how differences in FCA incentives affect in-house fraud detection efforts coordinated by MFCUs through quasi-experimental analysis.

Previous legal studies have noted that incentives to file *qui tam* suits per FCA provisions may create a form of moral hazard among *qui tam* plaintiffs because there are no consequences for bringing for baseless suits (Matthew, 2006; Rich, 2007; Engstrom, 2012a,b; Lockman, 2015). Also, even if the case is pursued by a *qui tam* plaintiff, it is first investigated by the DOJ. Thus, if provisions that increase the expected award amounts consequently induce specious claims, then fraud enforcement agencies will incur significant resource drain due to opening illegitimate or spurious cases. On the provider side, fraudulent promotion of low-value medicine has been shown to create longstanding treatment practices that are difficult to reverse via civil action (Kesselheim et al., 2011); however, the possibility of a *qui tam* suit may still promote overall deterrence effects, as measured by off-label use and Medicaid prescription drug spending (Forlines and Yelowitz, 2017).

We examine the association of case-level characteristics of *qui tam* suits and MFCU investigations with the level of incentives for pursuing FCA cases and public awareness of these incentives. We estimate a linear model using panel data assembled from the Office of the Inspector General (OIG), the DOJ, and state legislative databases to construct a novel dataset that details *qui tam* plaintiff actions, fraud enforcement efforts by DOJ and by MFCUs, and *qui tam* plaintiff incentives. We supplement this data with metrics on public awareness of state-level FCA provisions and litigiousness. Our sample is restricted to unsealed *qui tam* cases, thus changes in investigative intensity are unobservable in the data. Our focus is the impact of state-level FCA provisions, which determine *qui tam* incentives, on the number of filed cases, DOJ assistance on such cases, and case length. We also examine whether these provisions affect investigation trends among state-level

fraud enforcement agencies.

We obtain three main results: (1) increased incentives to file civil *qui tam* suits neither increased the number of filed suits nor the number of specious suits; (2) these incentives resulted in increasingly resource-intensive cases, as measured by case length; and (3) increased incentives reduced the number civil cases pursued by centralized fraud enforcement agencies. Our results suggest that efforts to decentralize fraud enforcement by incentivizing private citizens may be unproductive and disadvantageous in the policy's current form. *Qui tam* plaintiffs are impeded by their ability to independently identify and pursue suits, a constraint not surmounted by incentives. These results also suggest that *qui tam* incentives have substantial impacts on in-house, centralized production of fraud enforcement. This raises questions as to whether this shift is socially optimal, which is an area for future study.

The following section describes the provisions of state-level FCAs which affect incentives to file *qui tam* suits, the prevalence of healthcare fraud, and institutional details on relevant federal and state agencies charged with fraud enforcement. Section 3 presents a conceptual framework for our empirical approach, which is described in detail in Section 4. The data underlying the measures identified in the empirical section are briefly described in Section 5. Section 6 presents empirical results. Section 7 concludes with discussion on the relevant implications of the results of this study.

## 2 Background

### 2.1 Incidence of Healthcare Fraud

Public insurance fraud can take various forms; Berwick and Hackbarth (2012) detail the largest sources of waste in the US healthcare system and estimate reductions of up to 20% of total healthcare spending by instituting more efficient use of resources and fraud detection. Feldman (2001) argued that healthcare fraud is perpetuated by limited returns to efficient operation as well as exacerbated by distorted price schemes. The em-

empirical literature on healthcare fraud has focused on a form of billing fraud: “upcoding”, which increases the reported gravity of patient conditions in order to extract higher reimbursements. This behavior has been studied in the context of institutional healthcare providers, like hospitals (Silverman and Skinner, 2004; Dafny, 2005) and skilled nursing facilities (Bowblis and Brunt, 2014); individual physicians (Fang and Gong, 2017; Brunt, 2011, 2015); and firms further upstream in the healthcare sector, such as pharmaceutical firms (Duggan and Morton, 2010; Alpert et al., 2013). Moreover, in public health insurance programs, the implementation of automatic payments and only periodic, random screenings exacerbates the problem (Sparrow, 2008).

The modern-day False Claims Act is now 30 years old. It is the most successful piece of anti-fraud legislation in US history, and it has always enjoyed strong bipartisan support. That is because it works by nurturing a public-private partnership with whistleblowers and by incentivizing integrity.

*Senator Chuck Grassley (R-IA) (2016)*

A majority of FCA-related recoveries (80%) are collected from within the healthcare sector. Among healthcare-related *qui tam* litigation resolved between 1996 and 2005, Kesselheim and Studdert (2008) documented that nearly two-thirds of the 352 cases involved defendants directly involved in healthcare delivery. During this period, they found that hospitals (29%) and physician practices (14%) were the most frequent types of defendant. Pharmaceutical firms represented only four percent of defendants, but represented 40 percent of recovered funds. Furthermore, in 2016, pharmaceutical manufacturers were the provider type that accounted for the greatest percentage of civil settlements and judgments (38%) pursued by MFCUs (Murrin, 2016). Individual providers accounted for most of the crimes prosecuted by MFCUs in 2016 (Levinson, 2017).

Employees of defendant organizations filed sealed complaints leading to *qui tam* suits in 75% of cases (Kesselheim and Studdert, 2008).<sup>6</sup> The Department of Justice then reviews

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<sup>6</sup>A complaint may be filed in any state where the defendant conducts business. Since most defendants

the complaint within 60 days to determine if the DOJ will join the suit. These complaints may also enter the system via state Attorney General Offices (AGO), which then assign them to MFCUs for an initial review (Barger Jr. et al., 2005). The decision to participate depends on the merit of the accusation, the reputation of the attorney assisting the *qui tam* plaintiff, and the available evidence (Engstrom, 2012a). It may also depend on the department’s available resources Engstrom (2012b). If the DOJ elects not to assist in the case, the *qui tam* plaintiff may still pursue the case and is the sole party responsible for determining when to settle the case. If the DOJ elects to assist on the case, the *qui tam* plaintiff is still named in the suit, but can no longer unilaterally accept a settlement. Governmental assistance represents a substantial amount of investigative resources and signals a more substantial basis for a suit than an unassisted case; accordingly, we observe in the data that these cases receive higher settlements than unassisted *qui tam* suits.

Adoption of state-level FCAs may affect the in-house production of fraud enforcement efforts by deterring crime. When choosing to commit fraud, the offender weighs the expected profit from the fraud against the expected costs. Civil penalty provisions directly increase the costs of committing fraud, conditional on being detected. *Qui tam* and award provisions might increase the probability of detection, thereby increasing the costs of committing fraud. Moreover, Perez and Wing (2017) presented a model of healthcare fraud wherein the fixed costs of defending an accusation of fraud and the reputation-related costs of a fraud investigation can induce providers, regardless of guilt, to avoid behaviors that could be perceived as fraudulent. This behavior arises because there are non-zero costs to being publicly accused of fraud.<sup>7</sup> Thus, *qui tam* and increased civil

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are single providers or physician practices (Kesselheim and Studdert, 2008), the set of eligible states where a *qui tam* suit may be filed is one. If a suit were filed against a hospital that was part of a chain and a physician that practiced in a single state, the choice set for the suit would be the state the physician conducts business. Separating the suits would violate the principal of “first to file”, which is a contentious issue that may hinder the case’s proceeding. For national firms, like pharmaceutical companies, discussions with attorneys that specialize in *qui tam* suits indicate that the decision of where to file depends on (1) the perceived amiability of judges on any appellate issues that must first be resolved; (2) witness availability; and (3) state-level FCA provisions which effect the size of the expected award. In a random selection of 500 cases from the study period, 2004-2016, we find approximately ten percent of *qui tam* defendants conducted businesses in multiple states.

<sup>7</sup>Karpoff and Lott Jr (1993); Bowen et al. (2010) document how announcements of fraud investigations negatively affect a company’s current and future stock prices, reputation, and legal settlements.

penalty provisions affect both probability of detection and expected costs of committing fraud, possibly reducing the incidence of civil fraud.

Studies of deterrence related to the FCA have largely focused on prescription drug spending. In a case study that follows the drug gabapentin, Kesselheim et al. (2011) found that a *qui tam* suit did not deter off-label prescription writing. This finding is consistent with previous documented barriers which encourage dis-adoption of low-value medical practices (Emanuel et al., 2016). In a broader study of off-label prescription use, Forlines and Yelowitz (2017) found that states with any type of state-level FCA had more Medicaid spending on prescription drugs and off-label prescription drug use than states without an FCA.

Deterrence may drive changes in the case load observed in the data but this study does not directly assess this effect. Instead, we contribute to this literature by considering how incentives to report fraud affect the incidence rate of private *qui tam* suits, the incidence of cases pursued by public fraud enforcement agencies, and the intensity with which cases are pursued. To the extent these shifts are driven by a reduced incidence of fraud episodes and reduced magnitude of fraud per episode or provider, then the implied effect is an overall gain in the efficiency of public funds spent on fraud enforcement. However, our study cannot causally identify deterrence as a driver of changes.

## **2.2 Provisions of the False Claims Act**

There are four main provisions of the FCA: (1) a protection provision which prevents retaliatory action; (2) a civil liability provision, which increases the financial penalty for fraud; (3) a *qui tam* provision, which incentivizes traditional whistle-blowers to become *qui tam* plaintiffs; and (4) an award provision, which compensates *qui tam* plaintiffs. These provisions of the federal FCA are in effect in every state, but state-level FCAs enhance them, applying to both state and federally funded programs within a given state's borders. Additionally, 25 states and Washington, D.C. have a state-specific FCA explicitly focused on healthcare fraud (See Figure 4).



The federal FCA’s protection provision prohibits retaliatory actions against whistleblowers, such as wrongful discharge, but there are limited ways for *qui tam* plaintiffs to seek tort remedies. State FCAs supplement the protection provision by providing such remedies when *qui tam* plaintiffs are fired, demoted, transferred, or otherwise harassed. These protections apply even if an individual reports fraud, but never files a FCA complaint. As of 2016, 31 states and Washington, D.C. have such supplemental protection provisions (See Figure 4). Callahan and Dworkin (2000) showed that these anti-retaliation measures vary in content and judicial interpretations across states and over time. All states, however, have whistleblower protection laws in place, which can act in place of FCA protection provisions. Therefore, we do not explicitly model the implications of this provision in the analysis.

The second most common state-level FCA provision relates to civil penalties. For the purpose of this analysis, we consider states to have civil penalties only if they are the equivalent of the federal civil penalty provision in magnitude and scope. Specifically, we code a state civil penalty provision as in effect when the quantity of falsely submitted claims is at least \$5,000 per claim and there is also a penalty for the magnitude of the fraud (three times the total value of incurred damages, as in the federal FCA). These settlements cover the damage incurred, investigation costs, and awards paid to *qui tam* plaintiffs. For plaintiffs who bring successful *qui tam* suits, such provisions increase the potential monetary award available to them. As of 2016, 37 states and Washington, D.C. have such a civil penalty provision as part of their state-level FCA. Since 2004, 25 states have implemented these provisions; nine states have implemented them since 2010 (See Figure 4).

The third most common provision of state FCAs permits *qui tam* lawsuits. Under the federal FCA, a *qui tam* plaintiff in any state can bring forth a suit on behalf of the federal government. If the state’s FCA permits such suits, then a given plaintiff’s actions can also represent state interests. These provisions are particularly important for preventing Medicaid-related fraud, which is a joint federal and state effort: overlapping *qui tam*

provisions entitle the state to a larger share of the total settlement. *Qui tam* provisions, like civil penalties, increase the maximum award for which *qui tam* plaintiffs are eligible. The plaintiff's share of any settlement depends on the value of the information they provide, which is assessed by the ruling judge at the suit's conclusion. Currently, 31 states and Washington, D.C. have both civil penalty and *qui tam* provisions as part of their state-level FCA. Since 2004, 19 states have implemented these provisions; seven states have implemented them since 2010.

An enhancement of the award provision is the fourth most common provision of state FCAs. If the state-level FCA does not include an award provision, then recoveries for fraud are returned to the state and federal government in proportion to the Federal Medical Assistance Percentages (FMAP) and the *qui tam* plaintiff is entitled to 20% of the federal government's recovery only. For example, if a state qualifies for an FMAP of 50%, then the whistle blower is entitled to a maximum of ten percent of the total amount recovered ( $0.2 \times 0.5 = 0.1$ ). If the state FCA has an award provision in effect, however, the *qui tam* plaintiff is entitled to 20% of both the state and federal governments' shares of the recovery ( $0.2 \times 0.5 + 0.2 \times 0.5 = 0.2$ ). States consistently adopted the *qui tam* and award provisions simultaneously, generally after or at the same time they adopted a civil penalty provision.<sup>8</sup>

## 2.3 Public Awareness

We would expect that effectiveness of the FCA depends on how well potential *qui tam* plaintiffs understand their incentives. Public coverage has been shown to increase public knowledge on policies (Barabas and Jerit, 2009). Further, news article volume and related Google search volume trends have been shown to be significantly and positively correlated (Nghiem et al., 2016). For the purposes of this study, information seeking behavior, as measured by Google search volume, proxies for public awareness among potential *qui tam*

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<sup>8</sup>Only Arkansas has implemented an award provision but not a *qui tam* provision; their current FCA was passed in 1993. Michigan adopted an award and *qui tam* provisions in 2005 and a civil penalty provision in 2008. See Table A1 in Appendix for additional details.

plaintiffs. This metric is henceforth referred as public awareness.

While specific cases of fraud may attract considerable public attention, changes to FCA law rarely garner prominent public coverage. Thus, testing the effect of these changed provisions on reports of fraud may be biased toward zero. Further, once a case is filed under the FCA, the records are sealed during the investigation (Department of Justice, 2012). Goel and Nelson (2014) used data from Google and Yahoo search engines to study the correlation between awareness of whistleblower laws, measured in 2012, on the incidence of *qui tam* plaintiff action from 2000-2009. They found a significant and positive connection: a ten-percent higher awareness of the FCA was associated with three additional federal corruption convictions for every million people. Awareness is measured as an index of the number of search hits, in Google and Yahoo, of terms related to the whistleblower laws and provisions. The study also used an index of the law's relative strength and breadth; however, this index was not a statistically significant predictor of the number of *qui tam* suits within a given timeframe.

While internet searches may raise public awareness of state FCAs, the content of these searches may not encourage individuals who are considering filing suit. For example, the Taxpayers Against Fraud Education Fund (TAF) site is a prominent search result when searching terms related to the FCA. It mentions that on average, a *qui tam* lawsuit takes about 38 months to resolve, and that awards are issued to *qui tam* plaintiffs in only 20% of cases (TAF Education Fund, 2005). According to Government Accountability Office report, which is another prominent search result, from 1987 to 2005, the median case length of *qui tam* plaintiff-initiated cases involving the Department of Justice is 38 months, ranging from four months to more than 15 years (Government Accountability Office, 2005). These sources, though dated, could affect the potential relator's perceptions about expected payoffs. Other prominent results include webpages of FCA-focused law firms, which facilitate the filing of *qui tam* suits. Overall, the direction of the expected effect is ambiguous.

## 2.4 Coordination Among Agencies

The reporting and collaboration requirements between state FCAs and state MFCUs was set by the Healthcare Fraud and Abuse Program Guidelines in 1997 (Department of Justice, 1997). The first stated goal of the program was that MFCUs should “Coordinate Federal, State and local law enforcement programs” as follows:

to control fraud and abuse with respect to public and private health plans...by ensuring that there is both (1) adequate coordination on issues concerning enforcement policy as well as (2) appropriate sharing of information among law enforcement entities about specific law enforcement efforts.

These guidelines establish the formal coordination between groups involved in cases brought forth under the the False Claims Act. The Department of Justice and the MF-CUs, for example, are expected to coordinate their efforts to produce “joint and parallel investigations and civil and criminal proceedings, where appropriate”, with the following rationale:

To ensure maximum recovery for the United States while minimizing duplication of effort, early coordination of the criminal, civil and administrative remedies is critical.

These guidelines, outlined by the US Attorney’s Criminal Resource Manual, imply a pooling of resources across agencies and are the basis for the inter-agency cooperation that *qui tam* suits selected for DOJ support stand to gain. Such inter-agency links, as well as spillover effects related to individual decisions to act as a whistleblower to the MFCU or as a *qui tam* plaintiff to the DOJ, motivate our study of the effects of state-level FCAs on fraud enforcement at both the federal and state level.

While there are no formal metrics of inter-agency cooperation, examples of such collaboration are found in the testimony before the United States House of Representatives Committee on Ways and Means as part of an inquiry on healthcare fraud. A former MFCU investigator and a current field investigator for the US Department of Health and

Human Services (HHS) and the Office of the Inspector General (OIG) , Special Agent Abhijit Dixit (2016) described the inter-agency efforts in the following way:

It is important to point out that our special agents' work is typically conducted in partnership with other Federal and State agencies as well as the private sector. We partner with other investigators, auditors, evaluators, and attorneys in OIG and in other agencies to most effectively investigate and prosecute fraud. These partnerships are invaluable in our enforcement successes. For example, OIG has strong relationships with Medicaid Fraud Control Units, which are state-level investigative units with which we work on the majority of our Medicaid investigations. As a former MFCU investigator, I know firsthand the benefits of leveraging the specialized knowledge of agents in each state's Medicaid program. Through several task forces and other partnerships we often work hand in hand with multiple Federal agencies.

Dixit further described the massive investment of investigative resources allocated within the first five days of a *qui tam* plaintiff's filing suit (Dixit, 2016):

When the Department of Justice received a complaint from Dr. Fata's office manager, OIG and our law enforcement partners acted immediately. We simultaneously began the initial phase of the investigation - determining whether the allegations were credible - and took steps to protect the potentially affected patients. From the investigative perspective, we retrieved and analyzed near real-time claims data to identify witnesses who could give us more information. We also began deploying traditional law enforcement techniques, which included conducting surveillance, interviewing key witnesses, serving subpoenas, and reviewing documents. We established a command post as a single point for investigators to relay information immediately to

a prosecution team. All available special agents were given assignments and worked through the weekend to identify the credibility of the allegation. Once we were able to develop enough evidence to corroborate the initial allegation, we obtained several warrants. Before executing any warrant, we develop an operational plan. In this case, the plan included information about the subject to be arrested, his criminal history and background; team assignments; emergency information, including the address of the nearest hospital; and detailed information about the location where the search and arrest warrants would be executed. A judge signed the warrants at approximately 4 a.m. On the same day, just after 6 a.m., the doctor was arrested and six search warrants were executed...deployed additional staff to each operational site where warrants were executed to provide information directly to patients and the public. OIG agents and other law enforcement personnel referred affected patients to a specially created victim-assistance hotline, staffed by DOJ, which provided around-the-clock information.

This testimony provides insight as to how decentralized fraud enforcement efforts may assist fraud enforcement agencies in achieving fraud enforcement goals and minimizing patient harm. In this case, the tip to start of the investigation also imposed immediate costs to the agency to establish the validity of the claim, which emphasizes how baseless claims may exhaust agency resources, rather than ease investigative burdens.

## **3 Conceptual Model**

### **3.1 Decision to become a *qui tam* plaintiff**

*Qui tam* plaintiffs initially gather evidence of fraud, typically through direct observation. This first step, observing fraud, is likely to be more challenging in healthcare fraud than

other areas of crime because of the stark information asymmetries that exist between the triangle of payers, providers, and patients.

Observing a single incidence of fraud may be attributed to the physician’s medical discretion, even if the observer is a fellow physician. Therefore, a potential *qui tam* plaintiff observes medical care with some noise. An observer becomes a potential *qui tam* plaintiff when the observed incidence of questionable claims exceeds the *qui tam* plaintiff’s margin of uncertainty ( $\epsilon$ ). While not necessarily a normal distribution, Figure 1 visualizes this dynamic.

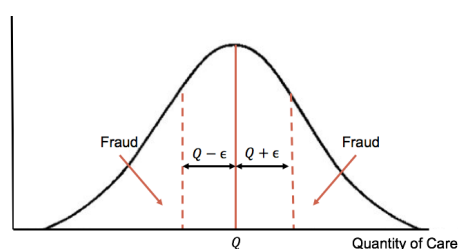


Figure 1: Observance of Fraud

An individual observes a quantity of healthcare inputs ( $Q$ ). Observers differ in terms of their margin of error ( $\epsilon$ ), but when the quantity falls outside their margin of error, they are then a potential *qui tam* plaintiff. Observers, who are either employees within a firm committing fraud or providers observing other providers, have a respective  $\epsilon$  smaller than the  $\epsilon$  of external regulators or patients.

The observed quantity of care that indicates fraud is not always the over-provision of care, such as billing or high-reimbursement surgical procedures; fraud may also be detectable through lower-than-expected quantities of care. For instance, if physicians rely heavily on surgery for conditions that might be otherwise managed by pharmaceuticals, then the underutilization of pharmaceuticals may be indicative of fraudulent practices. In a recent case, a settlement was obtained due to a provider payment scheme which incentivized excessive amounts of hospice care; the investigation was triggered due to low levels of curative treatment and high levels of hospice services (Department of Justice, 2017).

Once an observer notices a pattern of care outside their margin of error ( $Q + / - \epsilon$ ), they have become a potential *qui tam* plaintiff (See Figure 1). Once this occurs, the potential *qui tam* plaintiff may then bring forward a claim when the expected payoff exceeds the expected cost of reporting the fraud. The *qui tam* plaintiff's payoff from a successful lawsuit is the expected, monetary award of the lawsuit. As discussed in the previous section, the civil penalty, award, and *qui tam* provisions increase the expected payoff to pursuing a *qui tam* plaintiff suit. Figure 2 presents the distribution of potential *qui tam* plaintiffs prior to state FCAs in blue; the introduction of state FCAs moves the distribution to the right and is represented by a red line. The blue dashed line is an illustration of the *qui tam* plaintiff's minimum necessary expectation of an award to file suit under the federal FCA, without any supplemental additions from state FCAs. The black dashed line is the updated point of reporting, following the passage of a state FCA provision that enhances the expected award amount.

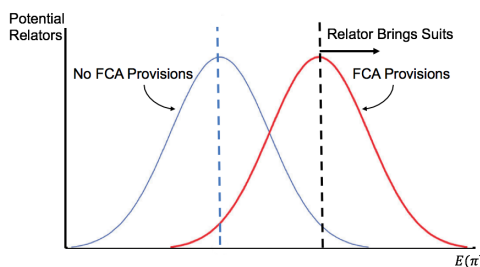


Figure 2: *qui tam* plaintiff's decision

Assembling a compelling *qui tam* case carries a large opportunity cost in terms of time. Attorney costs are often contracted on a contingency basis, where the attorney only receives compensation if a settlement is obtained. Bringing a suit against one's employer also carries the cost of potential reduced marketability for future jobs in the industry (Lim et al., 2017). While the federal FCA provides remedies for employees who are fired, demoted, or harassed after filing a *qui tam* lawsuit, and many states have a protection provision which forbids an employer from directly punishing such plaintiffs, these measures do not protect against reputation costs that translate to lost income or higher job search costs.



Contrastingly, potential *qui tam* plaintiffs may intuit two specific costs to *not* bringing suit once they suspect fraud. A *qui tam* plaintiff may act out of concern that they will be liable for not reporting fraud. For example, a physician has both an ethical and legal obligation to report misconduct of other physicians, particularly when it causes a patient harm. Thus, bringing suit is a way to minimize personal criminal or civil liability. However, this effect could also be achieved by reporting the firm to government fraud enforcement agencies as a whistleblower, rather than by bringing suit. Psychologically, an employee contemplating whistleblowing may experience emotional costs associated with remaining silent about suspected fraud, such as guilt or shame. These emotional costs, however, are likely mitigated by anonymously reporting fraud.

There are two conditions under which these provisions will have no effect on the number of *qui tam* plaintiff-initiated cases: first, if every actionable incident of fraud is reported prior to the implementation of the FCA provisions (this condition seems unlikely to hold); and second, if there is not an excess supply of potential *qui tam* plaintiffs prior to the implementation of the FCA provisions. If the difference between committed and reported fraud is due to the potential *qui tam* plaintiff's margin of uncertainty, then the FCA provisions will have no effect on the incidence rate of *qui tam* plaintiff suits.

*Hypothesis: State-level FCAs will not affect the number of qui tam plaintiff-initiated cases if high margins of error limit the availability of potential qui tam plaintiffs or if the expected value of a payoff remains below the potential plaintiff's own expected costs.*

This conceptual framework provides a rationale for the underlying dynamics that might be observed in the data. This framework does not, however, provide a clear prediction of outcomes following the adoption of state-level FCAs. These effects are an empirical puzzle to which we apply the data to in order to attempt a solution.

### **3.2 Choosing centralized fraud enforcement output**

For the purposes of this analysis, we assume agencies choose a mix of cases, given the priorities and preferences of the supervising elected official and budget. In the case of the

DOJ, the mix depends on the sector of the economy, such as defense or healthcare. In the case of MFCUs, the mix is the ratio of criminal and civil cases. Another assumption is that the budget constraint of the MFCU is binding during the year; in other words, there are more possible cases to investigate than there are resources. This model is illustrated in Figure 3a. The black line outlines the set of possible cases the MFCU can pursue, given its budget constraint. This budget constraint is issued as an annual grant. The placement of the red curved line reflects one set of possible preferences assigned to the MFCU. This figure is meant to illustrate a base case, where only the federal FCA applies. The figure also shows the tangential point at which the utility curve (red line) is tangential to the budget constraint. This line is unique across states, given the priorities of the respective Attorney Generals and Governors, who render decisions about financing and staffing.

Figure 3: MFCU Investigation Outputs

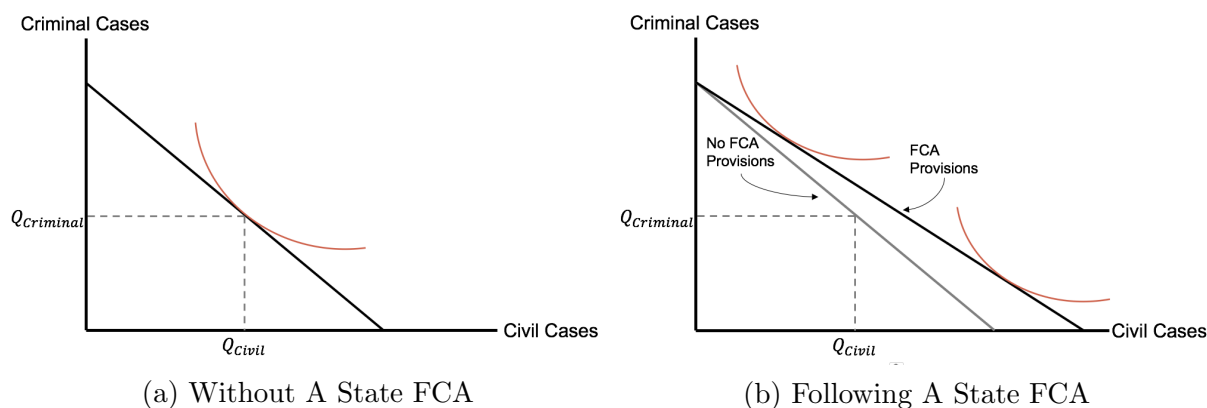


Figure 3b presents the changes introduced by state FCA provisions. Assuming there are no changes in the incidence of fraud, state FCA provisions that induce potential *qui tam* plaintiffs to move forward reduce the costs of a civil case. Lowered costs take the form of reduced legal fees, since *qui tam* plaintiffs build their evidence independently, hire their own representation, and work on a contingency basis. While the MFCU can assist, there is less burden on the MFCU when a *qui tam* plaintiff pursues their own case than when they pursue a fraud tip and build the case themselves. This lowered cost is reflected in Figure 3b as an outward shift of the MFCU's budget constraint along the civil case

axis.

While the budget constraint has shifted between Figure 3a and Figure 3b, the effect on the allocation of effort between civil and criminal cases is less clear. The red utility curves on Figure 3b demonstrate possible alternative points.

If the cost of performing a civil investigation is lower, the MFCU could respond by pursuing more civil cases at the same level of depth as before the change in *qui tam* plaintiff incentives. The MFCU could also respond by pursuing the same number or fewer cases at a greater depth because they specialize in the subtle cases of fraud that fall within the error range of the potential *qui tam* plaintiff, making it difficult to discern if the observed behavior is fraud. In the empirical analysis, we observe the number of civil and non-civil (criminal) cases and *qui tam* case length. This allows us to directly observe if the number of civil cases increases (“income effect”). Conversely, if the MFCU chooses to pursue more in-depth civil or criminal cases or to focus on more criminal cases (“substitution effect”) we can observe this by determining the effect of state FCA provisions on the number of criminal cases and case length.

*Hypothesis: State FCA provisions discount the cost of pursuing civil offenses to MFCUs, which will affect investigative resource allocation.*

To understand how the budget constraint of the MFCU is linked to the number of investigations and the depth of those investigations, we write the budget constraint in terms of the grant money issued to the MFCU ( $Grant^{MFCU}$ ) and the relative share of resources allocated to civil investigations ( $\alpha$ ) and criminal investigations ( $1 - \alpha$ ). Resources for each type of investigation can be expressed as the number of MFCU cases ( $N$ ) and the quality of the investigation ( $Qu$ ). In a setting where there is no coordination between the DOJ and MFCUs, the MFCU is responsible for its own cases and its budget constraint can be expressed as:

$$Grant^{MFCU} = \alpha N_{civil}^{MFCU} \cdot Qu_{civil}^{MFCU} + (1 - \alpha) N_{criminal}^{MFCU} \cdot Qu_{criminal}^{MFCU}$$

In a setting where there is coordination between the DOJ and MFCUs, the MFCU is responsible for its own cases, as well as providing some assistance to the DOJ for Medicaid-related program fraud, and its budget constraint can be expanded to reflect this coordination:

$$Grant^{MFCU} = \alpha(N_{civil}^{MFCU} \cdot Qu_{civil}^{MFCU} + N_{civil}^{DOJ} \cdot Qu_{civil}^{DOJ}) + (1 - \alpha)N_{criminal}^{MFCU} \cdot Qu_{criminal}^{MFCU}$$

Note that no additional resources are allocated to the MFCU when there is coordination; this is consistent with the funding model of MFCUs, wherein grants are determined the year before the current period and are not adjusted during the year based on caseload.

In the empirical analysis, the quantity of MFCU cases is directly observable in the annual reports. The number of *qui tam* cases in which the DOJ elected to participate is also observable from the DOJ reports, but the subset of those cases that involve both MFCU and DOJ coordination is not directly observable. The depth of the MFCUs investigations are unobservable in the data. However, we can test the comprehensiveness of the investigation-related effort invested in DOJ-assisted *qui tam* cases by using the length of time a *qui tam* case was investigated and tried as a proxy for case depth.

*Hypothesis: If state-level FCAs reduce the number of civil cases pursued by state MFCUs, without increasing the number of criminal cases pursued by the MFCU, then more effort, measured in terms of the case length, will be allocated toward qui tam plaintiff-initiated cases.*

## 4 Empirical Method

### 4.1 Number of *Qui Tam* Cases

To test the effect of state FCA provisions on *qui tam* plaintiff-initiated suits, we estimate random effects models. The dependent variable is the number of *qui tam* plaintiff-initiated

cases per one million state residents in a year.

$$Cases_{st} = \alpha_c Civil_{st} + \alpha_f Award_{st} + \beta_1 FCA\ awareness_{st} + \beta_2 X_{st} + \theta_t + \epsilon_{st} \quad (1)$$

After the effective date, state-level FCA provisions apply to any open cases and future cases. To account for the change in effect in incentives,  $Civil_{st}$  equals one if the state  $s$  has a civil penalty comparable to the federal FCA (or higher).  $Award_{st}$  equals one if a state  $s$  has a state FCA with an award or *qui tam* provision. With a large enough sample and sufficient variation, we would introduce each provision type as a separate covariate. All states that did adopt an award or *qui tam* provision already had a civil provision in place. Therefore, we estimate the direct effect of having a civil penalty comparable to the federal FCA and the effect of supplementing the civil provision with award and/or *qui tam* provisions.

The coefficients of interest,  $\alpha_c$  and  $\alpha_f$ , present the marginal effects of these FCA provisions. If the marginal effect of the civil penalty or the joint *qui tam* and/or award provisions is positive, then these provisions encourage more *qui tam* plaintiff-initiated cases, likely by increasing the expected award amount. A negative marginal effect of either provision would be consistent with fewer cases being brought forward, implying a deterrent effect. No statistically significant relationship would suggest that potential *qui tam* plaintiffs are not constrained by incentives, but rather by uncertainty in their ability to observe and prove civil fraud.

Public awareness of FCA is conveyed by the average index value of search terms from Google Trends ( $FCA\ awareness_{st}$ ). This awareness is the average Google Trends Index value. This index assigns 100 to the state with the most search traffic related to a specific term. A second state could be assigned a value of 40, meaning the term has 60% less search traffic than the state with the most search volume. States are assigned a value of zero when the term was less than one percent as popular as New York.

The vector of other relevant state-year level covariates ( $X$ ) includes the logged en-

rollment in Medicaid and Medicare to control for the relative differences in government exposure to healthcare fraud. It also includes the rate of malpractice suits for minor damages per one million state residents, as a measure of litigiousness which may contribute to inflated spending which is independent of fraud. Baicker et al. (2007) find that malpractice awards and premiums resulted in higher Medicare spending, particularly among services linked to defensive medicine.

A fixed effects model is the standard approach for panel data; however, a random effects model is more appropriate in this setting due to the nature of the data. A fixed effects model would effectively remove observations from states that have a long-standing state-level FCA in place (See Table A1). Since some state-level FCAs are practically time invariant in the available data period, a random effects estimator simultaneously models the process by which time-invariant FCA provisions differ from the effects of state-level FCAs, reducing the loss of information (Bell and Jones, 2015). The data's small sample size within groups render fixed effects estimates susceptible to high variance within groups. Although up to 86 healthcare-related *qui tam* cases are filed each year, 95% of state-years have four or fewer cases per state-year. Park et al. (2004) separately estimate fixed and random effects models using opinion polls collected immediately before an election, externally validating estimates with election outcomes. Random effects models outperformed fixed effects models in the study when observations per group were comparable to our data. This advantage exists due to the partial pooling property of random effects models, wherein the extent of information extracted from a group depends on the size of the group (Bafumi and Gelman, 2006). For the purposes of this analysis, the use of random effects allows us to learn as much as possible from the observed cases, without allowing high variance of low sample size per state year to inflate the standard errors.

The main criticism of the random effects model is the possible correlation between covariates and residuals. This correlation could potentially introduce bias to the coefficient estimates. The bias increases with the correlation between other state-level time-invariant effects and state-level FCA provisions. Since a Hausman specification test is susceptible

to issues of low statistical power, we adopt a random-effects model based on the amount of data per group and the correlation between regressors and state-fixed effects, as suggested by Clark and Linzer (2015).

Within the the random effects model, we include year-specific indicators to control for year-specific variation that applies to all states. For example, in 2009, the Fraud Enforcement and Recovery Act broadened the FCA to apply to any submission of a false claim, knowingly or not, to either the government or one of its subcontractors. This change could have affected rates at which *qui tam* plaintiffs brought forth healthcare-related cases because utilization of social welfare programs, such as Supplemental Security Income (SSI) and Medicaid, are often linked. Furthermore, a federal budget freeze at the DOJ, such as the one that took effect from 2011 to 2014 (Department of Justice, 2014), could increase reliance on MFCU collaborations or the distribution of annual budgets across cases.

## 4.2 Effort Allocated to *Qui Tam* Cases

### 4.2.1 Assistance

We first test whether the DOJ decision to assist a *qui tam* case changes over time as a measure of fraud enforcement at the extensive margin. If the state-level FCA provisions induce specious suits, then the DOJ will elect to assist in a smaller proportion of filed suits over time. If state-level FCA provisions induce legitimate *qui tam* plaintiffs to come forward, then the number of assisted cases will increase. Similarly, if these provisions free up the resources of other enforcement agencies, like MFCUs, and there is subsequent pooling of resources, then the DOJ may increase the share of DOJ-assisted cases. We estimate the effect of state-level FCA provisions on the DOJ elects to assist in a random-effects specification. The dependent variable in this specification is  $Assist_{ist}$ , which equals

1 when the DOJ elects to assist the *qui tam* case and 0 otherwise:

$$Assist_{ist} = \alpha_c Civil_{st} + \alpha_f Award_{st} + \beta_1 FCA\ awareness_{st} + \beta_2 X_{st} + \theta_t + \epsilon_{st} \quad (2)$$

If public awareness of state-level FCA provisions ( $FCA\ awareness_{st}$ ) resulted in excessive specious claims, then we would anticipate a negative and significant coefficient  $\beta$ . Government agencies could dismiss within the 60-day period, reducing the share of cases they elect to assist in as the denominator increases.

#### 4.2.2 Case Length

We test for differences in case length, as a measure of in-house investigation efforts via a random effects model. The covariates  $X_{st}$  are the same as Equation 1.

$$\begin{aligned} \ln CaseLength_{jst} = & \alpha_c Civil_{st} + \alpha_f Award_{st} + \beta_1 FCA\ awareness_{st} \\ & + \beta_2 X_{st} + \beta_3 Assist_{jst} + \theta_t + \epsilon_{st} \end{aligned} \quad (3)$$

$CaseLength_{jst}$  is the length of time between the date that a case was submitted for election by the *qui tam* plaintiff and the final settlement date. It reflects effort input by the DOJ and, given the guidelines outlined by HHS, the effort of agencies like MFCUs. If the length of time devoted to a case increases as state-level FCA provisions are implemented, this reflects a change in the distribution of in-house resources unobservable from investigation count alone. If the DOJ did not elect to assist with the case, we assume no more than 60 days were spent on the case; these months are the standard amount of time the agency is allotted to investigate. When the DOJ did elect to assist with the case, then we add 60 days to the time the agency elected to assist and the settlement date. In ten percent of cases, the DOJ made a decision to settle the *qui tam* plaintiff's case within the 60-day period. In these cases,  $CaseLength_{jst}$  is still set at 60 days, which reflects the period during which agencies allocated resources to investigate the claim.



Negative coefficients for state-level provisions imply that these provisions encourage suits which are weaker than those brought forth prior to these provisions (“moral hazard” on the part of the plaintiffs). Positive coefficients for state-level provisions, on the other hand, imply that stronger cases are being filed after state-level FCAs are implemented.

This specification controls for differences between cases with which the DOJ elected to assist ( $Assist_{jst}$ ) and those they did not. DOJ assistance is not random; prior to a decision, the DOJ conducts an extensive investigation and chooses to pursue strong cases. Consequently, DOJ assistance can signal credibility to a presiding judge. Further, DOJ assistance represents more comprehensive legal and investigative resources than a *qui tam* plaintiff may have (Vogel, 2010). For these reasons, one approach would be to limit the case-length analysis to cases where the DOJ elected to assist. However, since the DOJ is not the only entity which can provide assistance and we do not directly observe support provided by state agencies, we include an indicator variable for DOJ assistance and acknowledge unobserved assistance from other agencies as a limitation of the research design.

### 4.3 Number of MFCU Civil and Criminal Investigations

To assess the effect of state FCAs on MFCU investigation, we estimate a fixed-effects ordinary least squares model using data from the MFCU performance reports. We estimate the fixed-effects model because there are more observations within each group, reducing the susceptibility to high variance measures. State-fixed effects across MFCUs are important for controlling for variation in other state policies which could affect monitoring of potential fraud and the incidence of fraud within the Medicaid program ( $\theta_s$ ). For example, permissive licensure and practicing guidelines for mid-level providers, such as nurse practitioners, increases the number of providers an MFCU must monitor in each year, relative to states where strict licensure limits the need to monitor physicians. Similarly, year-fixed effects are important to the analysis because national investigations of Medicare fraud may affect the output of MFCUs in a given year. We use the following

specification:

$$\begin{aligned}
 Investigation_{jst} = & \alpha_c Civil_{s,t-1} + \alpha_f Award_{s,t-1} + \theta MFCUStaff \\
 & + \beta_1 FCA\ awareness_{st} + \beta_2 X_{st} + \theta_s + \theta_t + \epsilon_{st}
 \end{aligned} \tag{4}$$

Investigations ( $Investigation_{jst}$ ) are either criminal or civil ( $j$ ) in state ( $s$ ) at year ( $t$ ), per 100,000 Medicaid enrollees. Similar to the previous specifications, the coefficients of interest are  $\alpha_c$  and  $\alpha_f$ .

State-level FCAs are implemented within months of their passage. If such a change in policy occurs, MFCUs may be slow to respond because their budget requests and effort allocation is set on a yearly basis, via the grant application process that funds the units. Therefore, we allow for a lag of one year ( $t - 1$ ) in this specification.<sup>9</sup>  $Civil_{st}$  equals one year after a state  $s$  has a civil penalty comparable to the federal FCA (or higher).  $Award_{st}$  also equals one if it is the year after a state  $s$  has a state FCA with an award or *qui tam* provision.

To control for a MFCU's capacity to pursue cases, we scale the total amount of money allocated to the MFCU by the number of staff as a proxy for the resources available to pursue fraud. Similar to the main specification, we also control for public awareness.

## 5 Data

### 5.1 Treatment: State-Level FCAs

The timing and details of state FCA provisions are publicly available and documented via searches of state legislature databases and Freedom of Information Act Requests submitted to OIG, (Table A1). In the empirical specification, the indicator variable for a civil penalty provision equals 1 if state FCA provisions specify a penalty equivalent in magnitude to the federal FCA. Award and *qui tam* provisions are largely uniform across

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<sup>9</sup>We test the sensitivity of the results to this chosen lag period. See Appendix Section E.

states; therefore, we code the indicator variable for 1 if the state-level FCA provision includes an award provision or if there is a state-level *qui tam* provision. Weaker sets of supplemental incentives are coded as 0, which may bias our results towards a null finding. Figure 4 demonstrates the variation across states in these provisions over the study period, ranging from 2004, the initial year in the study period of *qui tam* cases; 2010, the initial year in the study period of MFCU cases; and through 2016, the most recent year of data for both sets of outcomes.

Table 2 presents the characteristics of states prior to FCA provisions by (1) whether states include both an award provision and a civil liability provision or not; and (2) whether they include a civil penalty provision. *Qui tam* plaintiff-initiated civil cases per state population in states with FCA provisions (prior to enactments) are not significantly different from those in states without FCA provisions. The resources available to pursue fraud for MFCUs in states with FCA provisions are not statistically different from those of their counterparts. These comparisons mitigate the concern about policy endogeneity regarding the outcomes of FCA provisions. MFCUs in states with both award and civil liability provisions, however, had significantly higher number of open fraud investigations than their peers. These states also tended to have more intensive public attention to FCA provisions.

## 5.2 Outcomes

The data on *qui tam* plaintiff-initiated civil cases come from the DOJ's full release of *qui tam* executed settlements in healthcare, in response to our FOIA request. The released data contain the details of 1,313 *qui tam* lawsuits tried in US District courts from 2004 to 2016, such as the election, the settlement date, and the amount awarded to *qui tam* plaintiffs. During the period from 2004 to 2016, the DOJ reported about two *qui tam* cases per state-year, which is equivalent to 0.26 cases per one million state residents (Table 1). We aggregated the case-level data to the state-level number of *qui tam* plaintiff-initiated cases per one million state residents.

Although trials progress across several years, we assigned each case to the year of its election date: the day the government decides to intervene and proceed with the case toward the action. An election date indicates the point at which the *qui tam* plaintiff accumulates sufficient evidence to file a suit and is made within 60 days of the initial suit. In these *qui tam* suits, the DOJ works closely with the state governments in deciding to pursue false claims in federally funded programs such as Medicare, Medicaid, and Tricare.

Among the six states that had a state-level FCA provision with only a civil provision, the distribution of *qui tam* cases increased in terms of the average and median after the civil provision took effect, relative to the pre-period (Figure 5a). Among the 32 states that had a civil provision and then adopted an award and/or *qui tam* provision in their state-level FCA, there is a similar, though less pronounced, upward shift in the incidence rate of cases (Figure 5b).

For the final set of outcome measures, we consider changes in MFCU investigations into Medicaid provider fraud and abuse or neglect. These measures are included in the OIG’s Annual Statistical Reports of MFCUs, from 2010 to 2016. These reports also contain information of MFCU staffing levels and the amounts awarded in the grants to each MFCU, which are control variables in a number of specifications in this study. State MFCUs brought forward an average of 34.3 open investigations per 100,000 Medicaid enrollees per year, which included 27.2 open cases for Medicaid fraud and 7.2 open cases for Medicaid abuse or neglect. A typical MFCU spent \$112 thousand dollars per staff member granted by the federal budget (Table 1). Figure 6 presents the distribution of MFCU civil and criminal cases from 2010 to 2016. The unadjusted trend indicates a pronounced decline in civil cases and a rise in criminal cases.

### 5.3 Other Covariates

Public awareness of the FCA is represented by three search terms from Google Trend by states in a given year over the course of the study period, 2004 to 2016: “whistleblower”, “False Claims Act”, and “*qui tam*”. They were selected based on their relevance to *qui*

*tam* lawsuits and the FCA, as well as the terms used in Goel and Nelson (2014). Within each year, Google Trend ranks the online search traffic for each keyword, relative to all queries. Google then uses this search volume to rank states using a normalized range. Particularly, the state with the highest number of searches for a specific search term is normalized to 100 and other states are assigned a lower value respective to the highest state (Choi and Varian, 2012). The measure of public awareness of the FCA is the average of these indices, with a higher value indicating more public attention to *qui tam* lawsuits and FCA. We test the sensitivity of these results when using alternative measures of those index values.<sup>10</sup>

Then, in order to measure public insurance program exposure to healthcare fraud in terms of enrollment, we use measures of enrollment, logged. Medicaid enrollment data are extracted from the Medicaid Statistical Information System (MSIS), which provides annual estimates of total program enrollment. Medicare enrollment data are extracted from CMS Office of Enterprise Data and Analytics. Total state population were taken from the Bureau of Economic Analysis.<sup>11</sup>

The final covariate is a measure of litigiousness: the number of malpractice cases filed for minor physical or emotional injuries.<sup>12</sup> The count of malpractice cases filed in the U.S. are publicly available via the National Practitioner Data Bank Public Use Data File. This file includes every malpractice suit and adverse action event filed in the U.S. since 1990. Since adverse actions are filed by enforcement agencies, we focus on cases of medical malpractice, which are more indicative of differences in litigiousness across states populations. Among cases of alleged malpractice, the outcome of the resulting injury is categorized into nine groups (Sowka, 1980). In the study, we include the count of cases that resulted in the lowest three categories of injuries to avoid malpractice cases that

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<sup>10</sup>We test the sensitivity of our results to alternative statistical measures of these indices, like the median and maximum, as well as including the search indices as separate covariates in Section 9; the results are consistent with the main findings presented.

<sup>11</sup>We test the sensitivity of our results to alternative denominators in Section 9 and find them to stable to the main results.

<sup>12</sup>We test the sensitivity of our results to an alternative measure of willingness to file suit for reasons orthogonal to case merits, like unemployment, in Section 9.

arise due to gross oversight, fraud, or abuse: emotional injury only, insignificant injury, or minor temporary injury. More serious categories include minor permanent injury, injuries that require lifelong care, or death. The rate of suits related to these serious outcomes is more likely to be representative of healthcare quality, not propensity to seek court remedies.

## 6 Results

### 6.1 *Qui Tam* Plaintiff-Initiated Cases

Panel A of Table 3 presents the effect of state FCAs on the number of *qui tam* plaintiff-initiated cases per one million state residents. The effect of FCA civil penalty provisions is an 0.11 reduction in the number of cases (Column 1,  $p < 0.05$ ). The estimated effect, however, becomes smaller and imprecisely estimated when controlling for the effects of civil penalty provisions supplemented with an award/*qui tam* provision ( $-0.056$ ). The additional provisions in state-level FCAs significantly increase the number of plaintiff-initiated cases by 0.11 ( $p < 0.05$ ). The average number of cases filed per one million residents is 0.23. Part of the estimated effect of award provisions is attributable to public awareness of FCAs (Column 3). The significant and positive relationship between public awareness of FCAs and *qui tam* plaintiff-initiated actions is consistent to the prior literature (Goel and Nelson, 2014).

The standard specification utilizing state fixed-effects is presented in Column 4. Given the low number of observations at the state-year level and the shorter panel of observed cases, relative to state-level FCAs, the fixed-effects estimator is vulnerable to high variance and excludes information of observations from states that had state FCAs in effect prior to the study period. The main differences to note between this model and the partially pooled specification is that public awareness of FCAs becomes an insignificant predictor of *qui tam* plaintiff-initiated actions. In both the fixed effects and partially pooled models, state-level FCA provisions had no significant impact on the number of

*qui tam* cases filed.

## 6.2 DOJ Assistance with *Qui Tam* Plaintiff-Initiated Cases

Panel B of Table 3 presents the estimated effect of state FCAs on the likelihood that the DOJ elects to assist a *qui tam* plaintiff-initiated civil case. On average, the DOJ assisted with 81% of *qui tam* cases. The decision to assist a *qui tam* case does not change as state-level incentives to file *qui tam* cases increase. The likelihood of DOJ assistance does appear to increase as Medicaid enrollment does (Column 4: 0.42,  $p < 0.10$ , and Column 5: 0.20,  $p < 0.05$ ).

## 6.3 *Qui Tam* Plaintiff-Initiated Case Length

Panel C of Table 3 reports the estimated effect of state FCAs on the length of time a *qui tam* case is settled; on average, cases were resolved in 520 days (one year and five months). Civil penalties increase the length of time invested in *qui tam* cases (Column 2: 0.37,  $p < 0.1$ ; Column 3: 0.37,  $p < 0.05$ ; and Column 5: 0.34,  $p < 0.1$ ). The effect is not statistically significant in the fixed effects specification (Column 4), but the point estimate is of similar direction and interpretation. In the random effects model, the length of *qui tam* cases in states with civil penalties is 40% longer than in other states (about 208 days). Civil penalty provisions supplemented with an award/*qui tam* provision increase the length of time invested in *qui tam* cases (Column 2: 0.22,  $p < 0.01$ ; Column 3: 0.20,  $p < 0.1$ ; Column 5: 0.24,  $p < 0.05$ ). In the random effects model, the length of *qui tam* cases in states with civil penalties is 27% longer than these in other states (about 140 days).

Once a case was selected for intervention by the DOJ, its length of time is 164% shorter than those without DOJ assistance. Case length also varied based on enrollment in public insurance programs: case length increased with the share of Medicare enrollment (Column 5: 0.62,  $p < 0.05$ ) and decreased with the share of Medicaid enrollment (Column 5:  $-0.52$ ,  $p < 0.05$ ). Finally, higher rates of malpractice suits for minor injuries were

associated with longer case times, consistent with the notion that a culture of litigiousness may encourage *qui tam* plaintiffs and their attorneys to pursue cases for longer than in states with lower rates of malpractice suits.

## 6.4 In-House Detection Efforts by MFCUs

Table 4 reports the effect of state FCAs on the number of MFCU investigations per 100,000 Medicaid enrollees. Within a year, the total number of MFCU investigations opened in a calendar year declined following the implementation of state-level FCA civil penalty provisions (Panel A, Column 5: 16 cases per 100,000 Medicaid enrollees,  $p < 0.001$ ). This estimated effect is consistent in magnitude and interpretation across all specifications. The full model, controlling for national changes over time via year-fixed effects, public awareness of FCAs, and MFCU resources, increases the magnitude of changes by two cases per 100,000 Medicaid enrollees. The effect of state-level award and/or *qui tam* provisions is consistently estimated to suggest a four case per 100,000 enrollee reduction across specifications, but the effect is not statistically significant.

The change in the total number of opened investigations might be driven by a 29 percentage-point reduction in the number of fraud investigations following the implementation of a civil penalty provision (Panel B, Column 5: 8 cases per 100,000 Medicaid enrollees,  $p < 0.05$ ). In Panel C, the effect of state-level FCA provisions on criminal cases is imprecisely estimated across specifications.

## 6.5 Robustness of Assumptions

### 6.5.1 Potential Endogeneity of State-level FCA Provisions

One potential concern with our empirical strategy is that the adoption of FCA provisions may be endogenous, particularly in the case of MFCU investigations. If states with higher expectations of fraud adopt FCA provisions, then the effect of the FCA provisions will be biased towards zero. We test for observable differences between states prior to their



adoption of state-level FCA provisions and states that did not adopt any FCA provisions over the study period (Table 2). We find that MFCUs were similarly funded and staffed between these two sets of states, though MFCUs in states that eventually adopted an FCA provision opened more cases than states that never adopted a provision.

A second potential source of endogeneity is that a *qui tam* plaintiff may not accurately estimate the value of the damages they observe and, thus, their expectation of an award can affect the decision to bring forward a suit. *Qui tam* plaintiffs could perceive their potential awards resulting from a successful suit differently than what is prescribed by the FCA provision. The data show judges routinely award a much smaller share of the maximum award to *qui tam* plaintiffs than what is permitted by law, even when the *qui tam* plaintiff has pursued the case independent of assistance from any federal agency. While in absolute terms, these settlements remain sizable (\$2.8 million), this trend could indicate to *qui tam* plaintiffs that award provisions are themselves a noisy signal.

To control for this possibility, we estimate the specifications with an additional covariate: amounts awarded to *qui tam* plaintiffs. Because settlements are ultimately a part of the public record, potential *qui tam* plaintiffs could observe previous *qui tam* plaintiff awards and use that trend to inform their own expectation of an award. We separately estimate the effect of the average amount awarded to *qui tam* plaintiffs in a geographic region, excluding the specific state  $s$ , as a covariate and the national amounts awarded, with a one year lag, also omitting state  $s$  (Table A2). The exclusion of one's own state is intended to mitigate the endogeneity concerns related to regressing current *qui tam* plaintiff action on lagged measures of *qui tam* plaintiff action in the same state. We find that most national award and regional award rates are not statistically significant at the conventional five percent level and the point estimates of the FCA provision coefficients are not different in magnitude or direction.

### 6.5.2 Sensitivity Analysis

We present several alternative specifications in the Appendix to ensure that the results are not artificially generated from assumptions made within the empirical approach. We broadly find results are consistent in their interpretation as the main results. First, we check alternative scales for outcome measures to ensure the chosen denominator is not otherwise correlated with state-FCA provisions (Appendix Section C). Second, we examine the extent to which the results vary based on metrics of public awareness from Google Trends (Appendix Section D). Third, responses by MFCUs may be short-lived or dependent on completed cases, not filed cases. Therefore, we test whether the effects of state-level provisions fade using a two-year lag, which is more reflective of the average time in which *qui tam* suits are settled in the MFCU case analysis (Appendix Section E). The fifth alternative specification considers whether the propensity to file suit, measured in terms of unemployment levels, affects our results (Appendix Section F).

## 7 Concluding Discussion

Prior to state-level adoptions of FCAs, the last major change to the federal FCA was in 1986. That amendment increased the number of overall cases and corresponded to a shift in agency focus from defense-related fraud to healthcare-related fraud (Rich, 2007). Given this response to an earlier increase in incentives to file *qui tam* suits, one might expect increased incentive to pursue *qui tam* cases at state-level would replicate these findings. Our first primary finding, however, is that these state-level FCAs have had no noticeable difference in the number of cases filed. Furthermore, the likelihood that the DOJ elected to assist on a specific case was unchanged by state-level FCA provisions, suggesting no change in the relative merit of filed cases. These outcomes indicate that state-level FCAs have not resulted in a high number of specious suits that have imposed excessive costs on fraud agency resources due to baseless claims by *qui tam* plaintiffs.

Our findings also support the hypothesis that FCA provisions may not affect *qui tam*

plaintiff-initiated cases due to high barriers to bringing suit or if the *qui tam* plaintiffs are inhibited by their inability to collect sufficient evidence of fraud. For example, OIG identifies suspicious billing via data analytics, which may not be detectable to an individual employee who process claims or patients. For example, OIG recently used data analytics to investigate and prosecute a physician whose office processed and approved certifications for 11,000 unique Medicare beneficiaries from more than 500 different home health agencies, which stood out to OIG because they observe fewer than 100 home health services patient referrals per physician (Dixit, 2016). Therefore, while individual citizens may observe fraud as employees of firms, as providers of care, or as patients, they may not be able to identify a systemic pattern of abuse or prove it without assistance from a fraud enforcement agency. Thus, efforts to encourage decentralized fraud enforcement, even if successful enforcement is compensated on a contingency basis, may require additional funding *ex-ante* to support the initial investigation of claims brought forth by *qui tam* plaintiffs.

We also find that, among filed cases, case length increased following the implementation of state-level FCAs. This finding implies that outsourcing initial surveillance via FCA provisions encouraged more in-depth investigations and effort in pursuing in settlements. The suggestion of more in-depth investigations within the DOJ is also mirrored by a reduction in civil cases pursued by state MFCUs. There was no discernible corresponding change in efforts to pursue abuse and neglect cases by MFCUs. The overlap between state and federal FCAs, as well as anti-fraud enforcement efforts conducted by MFCUs suggests possible specialization between cases pursued by the MFCUs and cases pursued via *qui tam* lawsuits. Future efforts to improve efficiency in fraud enforcement should consider whether specialization among cases is welfare-improving.

The Medicaid program represents 20% of all estimated improper payments, the highest rate among all social welfare programs in the U.S. (Dodaro, 2016). By incentivizing *qui tam* plaintiffs to pursue cases in exchange for a share of the amounts recovered, the FCA acts to decentralize fraud enforcement. When potential *qui tam* plaintiffs are incentivized

to bring suit, however, they are then often unable to identify or prove fraud. Therefore, subsequent shifts in fraud enforcement efforts from MFCUs to private citizens may not be socially optimal because the efficiency of decentralized efforts to reduce fraud might be overestimated. Whether changes in MFCU investigations represent a socially optimal specialization between decentralized, private enforcement and centralized public agencies is an avenue for future research.

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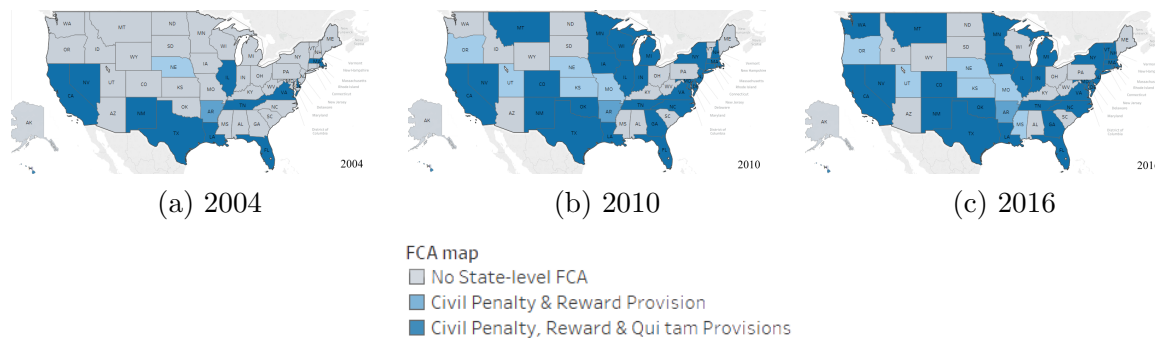


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## 8 Figures

Figure 4: State-level FCA Provisions Implemented in 2004, in 2010, and in 2016

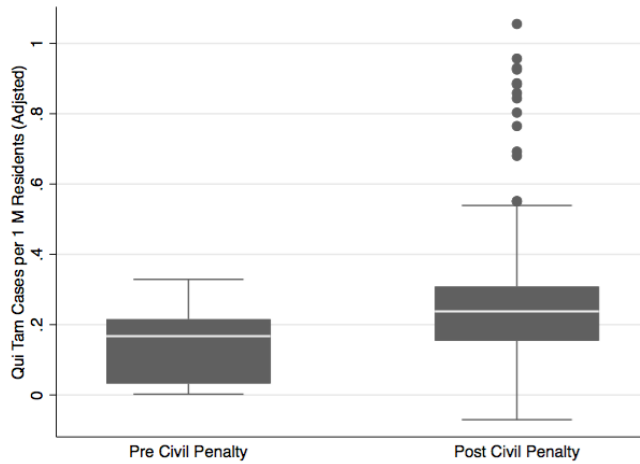


*Note:* (1) “No State-level FCA” refers to states without a state-specific FCA in place. “Civil Penalty” refers to states where the state FCA includes a civil penalty provision equivalent or more to the federal penalty. “Civil Penalty & award” refers to states where the state FCA includes a civil penalty provision and an award provision, but not a *qui tam* provision in their state FCA. “Civil, award, & *Qui tam*” refer to states with a civil penalty, award provision, and a *qui tam* provision in their state FCA. (2) 2004 is the first year of data for the *qui tam* case-level analysis. 2010 is the first year of data for the Medicaid Fraud Control Unit-level of analysis. 2016 is the most recent year of data for both sets of analyses.

*Source:* State statutes compiled by the author (See Table A1)

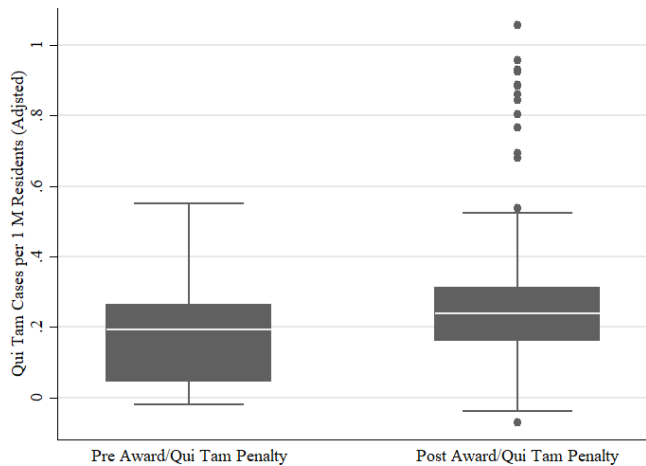
Figure 5: Distribution of Filed *Qui Tam* Cases

(a) Among States that adopted a Civil Penalty Provision



*Note:* (1) Y-axis is the number *qui tam* suits/1M residents. Six states only had a civil penalty provision in our study period: KS (enacted in 2009), MI (2013), MO (2007), NE (2004), OR (2010). *Qui tam* suits typically take more than a year to resolve, after filing suit; therefore, this is not measure of solved cases. (2) The number of cases are adjusted for public awareness (Google trend measure) and year fixed effects. (3) The left-side distribution represents the years before a civil penalty taking effect. The right-side distribution represents the years after a civil penalty takes effect. Cases from year 0 are excluded. For distribution across years, see Figure A1. (4) Study period: 2004-2016.

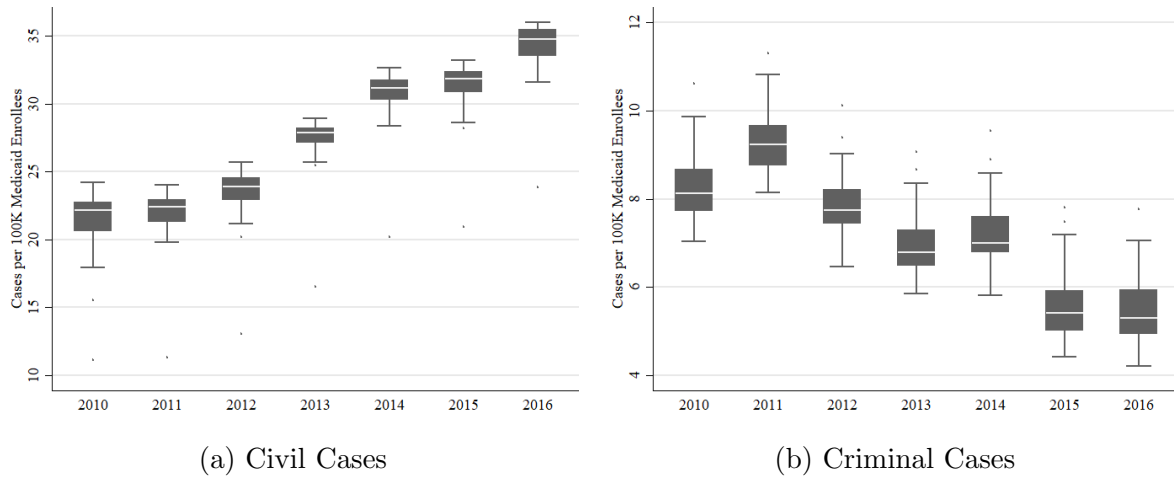
(b) Among States that adopted *Qui Tam* &/or Award Provisions



*Note:* (1) Y-axis is the number *qui tam* suits/1M residents. States with a civil penalty that adopted a *qui tam* and/or award provision in our study period: AR, CA, CO, CT, DC, DE, FL, GA, HI, IA, IL, IN, LA, MA, MD, MI, MN, MT, NC, NH, NJ, NM, NV, NY, OK, RI, TN, TX, VA, VT, WA, and WI. *Qui tam* suits typically take more than a year to resolve, after filing suit; therefore, this is not measure of solved cases. (2) Notes (2)- (4) of Figure 5a apply. For distribution across years, see Figure A2.

*Source:* Freedom of Information Act request submitted to the Department of Justice.

Figure 6: Medicaid Fraud Control Unit Investigations, 2010-2016



*Note:* (1) Y-axis is the number of MFCU cases/100,000 Medicaid enrollees. MFCUs are state-run agencies charged with pursuing provider fraud, waste, and abuse. MFCU cases are broadly categorized as civil or criminal. (2) Rates are adjusted for state and year fix effects, public awareness, and MFCU staffing levels. (3) Years: 2010-2016.

*Source:* Annual MFCU Reports obtained online from the Office of the Inspector General.

## 9 Tables

Table 1: Summary Statistics of Outcomes and Covariates

	Mean	Std. Dev	Median	Min	Max	Obs.
<i>Qui tam</i> suits:						
Cases (per 1M)	0.2	(0.5)	0	0	4.4	662
DOJ assistance rate	0.4	(0.5)	0	0	1	662
Settlement (\$M)	15.6	(91.0)	1.3	0.01	1516.5	662
Case length (days)	520.0	(624.1)	263	60	3935	1123
Plaintiff award (\$M)	2.8	(10.7)	0.2	0	131.2	1123
Medicaid Fraud Control Unit:						
Total investigations	34.3	(36.9)	23.5	2.2	269.1	349
Civil investigations	27.2	(31.8)	18.6	0.8	255.5	349
Criminal investigations	7.2	(13.1)	3.0	0	104.1	349
Funding (\$M)	4.8	(7.9)	2.1	0.4	48.2	349
Staff	38.2	(54.3)	19	4	317	349
MFCU funding/staff	118.6	(23.6)	114.1	62.2	194.2	349
Google trend measures:						
FCA Awareness	0.2	(0.1)	0.1	0	1	662
(1) Whistleblower term	0.3	(0.2)	0.3	0	1	662
(2) <i>Qui tam</i> term	0.09	(0.2)	0	0	1	662
(3) False Claims Act term	0.08	(0.2)	0	0	1	662

*Note:* (1) *Qui tam* cases are scaled per 1 million state residents. Sample represents all states and DC, from 2004-2016:  $51states&DC \times 14years = 612$  observations. (2) Case length is the number of months between the month the DOJ decided to assist or not and the date when the case was settled. Sample represents all healthcare-related *qui tam* cases from 2004-2016: 1,009 cases. (3) MFCU sample represents states and DC which had an operating MFCU, from 2006-2016. North Dakota is excluded from all years, as well as Iowa in 2006; Iowa's MFCU was not established until 2007:  $50states&DC \times 11years - 1state - year(IA, 2006) = 549$  observations. (4) Investigations (total, civil, and criminal) are presented as the number of cases per 100,000 Medicaid enrollees. (5) MFCU funding/staff is the amount granted to operate the MFCU, scaled by the number of staff. (6) Search index is the average Google score for the three terms, scaled  $[0, 1]$ . These scores were collected for each year during the time period 2004-2016. Sample represents all states and DC, from 2004-2016:  $51states&DC \times 15years = 663$  observations.

*Source:* DOJ *Qui Tam* Suits, OIG MFCU Annual Reports, CMS Medicaid and Medicare Enrollment Reports, Census, Google Trends

Table 2: Characteristics of States by FCA provision types: prior to enactments and states without provisions

	Award/ <i>Qui tam</i>			Civil		
	Pre-Provision	None	p-value	Pre-Provision	None	p-value
<i>Qui Tam</i> Suits:						
Cases (per 1M)	0.12 (0.22)	0.17 (0.38)	0.049	0.11 (0.23)	0.20 (0.42)	0.086*
DOJ assistance rate	0.35 (0.48)	0.28 (0.45)	-0.065	0.28 (0.45)	0.33 (0.47)	0.053
Settlement (\$M)	1.86 (3.04)	25.0 (97.5)	23.1*	1.86 (3.01)	29.7 (108.1)	27.8*
Observations	81	246	327	107	168	275
Case length (days)	854.7 (1094.1)	530.0 (724.7)	-324.7*	856.6 (1058.4)	555.1 (768.5)	-301.6*
Plaintiff award (\$M)	0.54 (1.24)	3.61 (12.7)	3.08***	0.52 (1.19)	4.20 (13.9)	3.69***
Observations	66	204	270	72	170	242
Medicaid Fraud Control Unit:						
Total investigations	58.1 (12.8)	34.4 (29.3)	-22.6**	69.8 (24.1)	33.6 (30.7)	-36.2***
Civil investigations	42.1 (16.4)	25.4 (24.5)	-15.7*	31.0 (22.3)	28.8 (29.0)	-2.24
Criminal investigations	16.0 (10.9)	9.02 (18.3)	-6.86	38.7 (38.8)	4.81 (5.22)	-33.9*
MFCU funding (\$M)	2.71 (5.75)	1.90 (1.72)	-0.83	2.46 (5.00)	1.97 (2.10)	-0.49
MFCU staff	23.9 (43.7)	17.9 (15.4)	-6.17	22.5 (38.0)	18.5 (18.7)	-4.05
MFCU funding/staff	108.9 (18.2)	106.1 (23.2)	-3.03	105.6 (18.1)	105.4 (24.5)	-0.19
Observations	48	207	244	64	130	194
Google trend measures:						
Search index	0.14 (0.12)	0.13 (0.082)	-0.0088	0.13 (0.11)	0.15 (0.090)	0.014
(1) Whistleblower term	0.27 (0.16)	0.32 (0.16)	0.056**	0.27 (0.16)	0.34 (0.17)	0.071***
(2) <i>Qui tam</i> term	0.084 (0.16)	0.041 (0.099)	-0.043*	0.064 (0.15)	0.060 (0.12)	-0.0041
(3) False Claims Act term	0.076 (0.14)	0.038 (0.089)	-0.038*	0.064 (0.13)	0.040 (0.087)	-0.024+
Observations	81	246	327	107	168	275

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) The mean and standard deviation, presented in parenthesis, among states that eventually adopted a provision in Columns 1 and 3 reflect the pre-adoption period. (2) *Qui tam* cases are scaled per 1 million state residents. Years: 2004-2016. (3) Case length is the number of months between the month the DOJ decided to assist or not and the date when the case was settled. Years: 2004-2016. (4) MFCU measures years: 2010-2016. (5) Investigations (total, civil, and criminal) are presented as the number of cases per 100,000 Medicaid enrollees. (6) MFCU funding/staff is the amount granted to operate the MFCU, scaled by the number of staff. (7) Search index is the average Google score for the three terms, scaled [0, 1].

Table 3: Effects of State-level FCA Provisions on *Qui Tam* Plaintiff-initiated Healthcare Fraud Cases

	(1)	(2)	(3)	(4)	(5)
<b>Panel A: Number of Qui Tam cases</b>					
Civil Penalty	-0.11*	-0.054	-0.039	0.013	-0.041
	(0.049)	(0.052)	(0.051)	(0.048)	(0.050)
Civil & Award Provisions		0.11*	0.083+	0.053	0.067
		(0.051)	(0.048)	(0.072)	(0.047)
FCA Awareness			0.69***	-0.23	0.63*
			(0.21)	(0.54)	(0.28)
Log(Medicare population)				0.48	-0.017
				(0.43)	(0.067)
Log(Medicaid population)				-0.0022	0.040
				(0.11)	(0.065)
Malpractices per 100,000 residents				-0.045+	0.0064
				(0.023)	(0.015)
Dep. Variable Mean	0.23	0.23	0.23	0.23	0.23
Dep. Variable SE	0.47	0.47	0.47	0.47	0.47
Obs.	662	662	662	662	662
<b>Panel B: government assistance in Qui Tam cases - case level</b>					
Civil Penalty	0.075	0.044	0.044	-0.013	0.040
	(0.084)	(0.082)	(0.083)	(0.11)	(0.11)
Civil & Award Provisions		-0.043	-0.042	0.049	-0.061
		(0.039)	(0.040)	(0.054)	(0.041)
FCA Awareness			0.026	0.0020	-0.12
			(0.14)	(0.43)	(0.16)
Log(Medicare population)				0.26	-0.25**
				(0.71)	(0.089)
Log(Medicaid population)				0.42+	0.20*
				(0.24)	(0.090)
Malpractices per 100,000 residents				-0.060+	0.0082
				(0.030)	(0.010)
Dep. Variable Mean	0.81	0.81	0.81	0.81	0.81
Dep. Variable SE	0.40	0.40	0.40	0.40	0.40
Obs.	1123	1123	1123	1123	1123
<b>Panel C: Length of Qui Tam cases - case level</b>					
Civil Penalty	0.20	0.37+	0.37*	0.022	0.34+
	(0.19)	(0.21)	(0.15)	(0.29)	(0.20)
Civil & Award Provisions		0.22+	0.20+	0.17	0.24*
		(0.12)	(0.11)	(0.28)	(0.10)
FCA Awareness			-0.49	-1.58	-0.48
			(0.37)	(1.32)	(0.55)
Govt assistance			-1.02***	-1.02***	-0.99***
			(0.13)	(0.14)	(0.13)
Log(Medicare population)				2.99	0.62*
				(3.18)	(0.25)
Log(Medicaid population)				0.0035	-0.52*
				(0.77)	(0.24)
Malpractices per 100,000 residents				-0.047	0.049+
				(0.093)	(0.025)
Dep. Variable Mean	5.49	5.49	5.49	5.49	5.49
Dep. Variable SE	1.29	1.29	1.29	1.29	1.29
Obs.	1123	1123	1123	1123	1123
State FE	No	No	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) Panel A: dependent variable (DV) is the number of *qui tam* cases/1M residents. Panel B: DV = 1 if DOJ assisted the case. Panel C: DV is the length of time between the filing date & settlement date (logged days). The average number of days/case: 242.3 (SD: 3.6). (2) “Civil”= 1 if the state had a state-level FCA with a civil provision in effect. “Civil & award” = 1 if the state had a state-level FCA with an award &/or *qui tam* provision. (3) Years: 2004-2016. (4) Search index is the average Google score scaled: [0, 1].



Table 4: Effects of State-level FCA Provisions on state participation to *Qui Tam* Plaintiff-initiated Healthcare Fraud Cases

	(1)	(2)	(3)	(4)	(5)
<b>Panel A: State participation in Qui Tam cases - case level</b>					
Civil penalty	-0.27*** (0.080)	-0.16* (0.078)	-0.15+ (0.078)	-0.31+ (0.18)	-0.15+ (0.087)
Civil & award provisions		0.15** (0.049)	0.13* (0.052)	-0.062 (0.066)	0.14* (0.062)
FCA awareness			0.13 (0.17)	-0.83 (0.55)	0.25* (0.11)
Log(Medicare population)				-0.94 (0.92)	-0.062 (0.11)
Log(Medicaid population)				-0.16 (0.26)	0.044 (0.092)
Malpractices per 100,000 residents				0.029 (0.030)	-0.018+ (0.010)
Dep. Variable Mean	0.22	0.22	0.22	0.22	0.22
Dep. Variable SE	0.42	0.42	0.42	0.42	0.42
Obs.	1121	1121	1121	1121	1121
State FE	No	No	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes
<b>Panel B: Length of Qui Tam cases - case level</b>					
Civil Penalty	0.20 (0.19)	0.37+ (0.21)	0.37* (0.15)	0.022 (0.29)	0.34+ (0.20)
Civil & Award Provisions		0.22+ (0.12)	0.20+ (0.11)	0.17 (0.28)	0.24* (0.10)
FCA Awareness			-0.49 (0.37)	-1.58 (1.32)	-0.48 (0.55)
Govt assistance			-1.02*** (0.13)	-1.02*** (0.14)	-0.99*** (0.13)
Log(Medicare population)				2.99 (3.18)	0.62* (0.25)
Log(Medicaid population)				0.0035 (0.77)	-0.52* (0.24)
Malpractices per 100,000 residents				-0.047 (0.093)	0.049+ (0.025)
Dep. Variable Mean	5.49	5.49	5.49	5.49	5.49
Dep. Variable SE	1.29	1.29	1.29	1.29	1.29
Obs.	1123	1123	1123	1123	1123
State FE	No	No	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) Panel A: DV = 1 if a state government participated to the suit. Panel B: DV is the length of time between the filing date & settlement date (logged days) of cases which involved a state government. (2) “Civil”= 1 if the state had a state-level FCA with a civil provision in effect. “Civil & award” = 1 if the state had a state-level FCA with an award &/or *qui tam* provision. (3) Years: 2004-2016. (4) Search index is the average Google score scaled: [0, 1].

Table 5: Effects of State-level FCA Provisions on the Number of Medicaid Fraud Control Units Investigations per 100,000 Medicaid Enrollees

	(1)	(2)	(3)	(4)	(5)
<b>Panel A: Total number of MFCU investigations</b>					
Civil Penalty	-13.7***	-14.5***	-14.8***	-14.9***	-16.1***
	(3.87)	(4.02)	(4.05)	(4.09)	(3.90)
Civil & Award Provisions		-3.93	-4.11	-2.58	-4.44
		(5.13)	(5.08)	(5.07)	(6.20)
FCA Awareness			-12.4	-9.47	-16.6
			(16.8)	(11.7)	(14.9)
\$MFCU/staff				-0.0041	0.0027
				(0.065)	(0.069)
Log(Medicare population)				-15.3**	27.8
				(4.95)	(69.6)
Malpractices per 100,000 residents				0.21	0.43
				(1.38)	(1.69)
Dep. Variable Mean	34.27	34.27	34.27	34.27	34.27
Dep. Variable SE	36.87	36.87	36.87	36.87	36.87
Obs.	349	349	349	349	349
<b>Panel B: Total number of MFCU fraud investigations</b>					
Civil Penalty	-7.52*	-7.64*	-7.87*	-8.16*	-7.95*
	(3.25)	(3.41)	(3.36)	(3.30)	(3.80)
Civil & Award Provisions		-0.56	-0.73	0.62	-1.54
		(3.15)	(3.10)	(3.00)	(4.29)
FCA Awareness			-12.0	-8.96	-17.0
			(11.2)	(8.24)	(10.6)
\$MFCU/staff				-0.011	-0.0072
				(0.046)	(0.052)
Log(Medicare population)				-12.6**	58.8
				(4.29)	(71.1)
Malpractices per 100,000 residents				-0.011	0.12
				(1.27)	(1.60)
Dep. Variable Mean	27.22	27.22	27.22	27.22	27.22
Dep. Variable SE	31.82	31.82	31.82	31.82	31.82
Obs.	349	349	349	349	349
<b>Panel C: Total number of MFCU abuse investigations</b>					
Civil Penalty	-5.60	-6.13	-6.14	-6.26	-7.47
	(5.02)	(5.15)	(5.23)	(5.20)	(6.48)
Civil & Award Provisions		-2.60	-2.59	-2.36	-2.09
		(2.71)	(2.75)	(2.84)	(2.99)
FCA Awareness			0.33	-0.079	1.08
			(7.58)	(6.86)	(8.16)
\$MFCU/staff				0.018	0.022
				(0.038)	(0.039)
Log(Medicare population)				-2.68*	-21.2
				(1.05)	(26.8)
Malpractices per 100,000 residents				0.081	0.13
				(0.33)	(0.36)
Dep. Variable Mean	7.23	7.23	7.23	7.23	7.23
Dep. Variable SE	13.13	13.13	13.13	13.13	13.13
Obs.	349	349	349	349	349
State FE	No	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) Panel A: DV is total number of MFCU investigations/100,00 Medicaid enrollees. Panel B: civil investigations. Panel C: criminal (abuse/neglect) investigations. (2) “Civil” = 1 if the state had a state-level FCA with a civil provision in effect for more than 12 months. “Civil & award” = 1 if the state had a state-level FCA with an award &/or *qui tam* provision in effect for more than 12 months. (3) All states & DC included, excluding ND, which does not operate a MFCU. Years: 2010-2016. (4) Search index is the average Google score scaled: [0, 1].

# Appendices

## Background Information on State-Level False Claims Acts

Table A1: Timeline of State FCA Provisions

State	State FCA
Arkansas	Arkansas Medicaid Fraud False Claims Act. Acts 1993, No. 1299, § 11; 2011, No. 1154, § 1; 2013, No. 1132, § 50
California	California False Claims Act, Cal. Govt. Code §§ 12650 through 12656. ARTICLE 9. False Claims Actions [12650 - 12656] ( Article 9 added by Stats. 1987, Ch. 1420, Sec. 1. ); (Amended by Stats. 2012, Ch. 647, Sec. 1. Effective January 1, 2013.). The California False Claims Act, which was enacted in 1987, is patterned after the federal act.
Colorado	Health Care Policy and Financing Act, Ch. 121, which took effect since July 1, 2001, imposing full restitution of damage and \$5, 000 per claim. Colorado Medicaid False Claims Act (CMFCA), Colo. Rev. Stat. §§ 25.5-4-303.5 through 25.5-4-310, allows <i>qui tam</i> lawsuits and increases civil penalties up to three times of damages and a range of \$5, 000 to \$10, 000 for each false claim. CMFCA became effective on May 26, 2010
Connecticut	Chapter 55e False Claims And Other Prohibited Acts Under State-Administered Health Or Human Services Programs. the Connecticut False Claims Act, Conn. Gen. Stat. §§ 4-274 through 4-289. History: Oct. 29 Sp. Sess. P.A. 97-1 effective October 30, 1997. Connecticut passed a FCA that into law on Oct 5, 2009. As recodified and amended by P.A. 14-217, effective June 13, 2014. Previously C.G.S. § 17b-301, et seq. In June 2014, the CT FCA was significantly expanded to cover violations related to other Agencies.

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State	State FCA
Delaware	<p>Chapter 12. Delaware False Claims And Reporting Act. Del. Code Ann. tit. 6, §§ 1201 through 1211. Delaware False Claims and Reporting Act, H.B. No. 543, 140th Gen. Assembly (Del. 2000) <a href="http://delcode.delaware.gov/title6/c012/">http://delcode.delaware.gov/title6/c012/</a>. In June, Delaware and Hawaii joined the ranks of states adopting their own <i>qui tam</i> laws; both of these new state laws are very similar to the federal FCA. Delaware False Claims and Reporting Act, H.B. No. 543, 140th Gen. Assembly (Del. 2000).</p>
Florida	<p>The Florida False Claims Act (“Florida FCA”) was enacted in 1994.1 The liability and damage provisions of the Florida FCA are identical to its federal counterpart.</p>
Georgia	<p>Georgia State False Medicaid Claims Act; The new 2012 Georgia Taxpayer Protection False Claims Act. On May 24, 2007, Georgia’s “State False Medicaid Claims Act” became law. It is based on the 2007 federal FCA, but protects only Medicaid spending. The new 2012 Georgia Taxpayer Protection False Claims Act now protects all state and local government spending. Ga. Code Ann. §§ 49-4-168 through 49-4-168.6 Georgia’s version of the Federal False Claims Act (FCA)<sup>2</sup> is the Georgia False Medicaid Claims Act (GFMCA).<sup>3</sup> The statute was recently amended to look more like its federal counterpart. The changes became effective on July 1, 2012.</p>
Hawaii	<p>Hawaii False Claims Act (S.B. No. 2115, 20th Leg., Act 126 (Haw. 2000) (to be codified at Ch. 661 of the Hawaii Revised Statutes). In June, Delaware and Hawaii joined the ranks of states adopting their own <i>qui tam</i> laws; both of these new state laws are very similar to the federal FCA.</p>
Illinois	<p>Illinois False Claims Act (IFCA), Ill. Ann. Stat. Ch.740, §§ 175/1-175/8, was enacted in 1991. The IFCA models the Federal FCA.</p>

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State	State FCA
Indiana	The Indiana False Claims and Whistleblower Protection Act. Indiana Medicaid False Claims and Whistleblower Protection Act, codified at 5-11-5.7 et seq (as amended through P.L. 109-2014). Indiana passed the Indiana False Claims and Whistleblower Protection Act (IFCWPA) in 2005. The IFCWPA generally models the federal FCA. P.L.222-2005, SEC.23 [H.1501. Approved May 11, 2005.]
Iowa	Iowa False Claims Act. Iowa Code §§ 685.1 through 685.7. 2010 Acts, ch 1031, §338; 2011 Acts, ch 129, §100, 101, 156. As enacted 2010 Acts, Chapter 1031 and amended by 2011 Acts, Chapter 129 (so that it conformed more closely to the FCA as amended by FERA, ACA, and Dodd-Frank. In 2010, the State of Iowa passed the Iowa False Claims Act (“Iowa FCA”), its own version of the federal False Claims Act (“FCA”). 2010 Acts, ch 1031, §338 (March 09, 2010)
Kansas	75-7501. Kansas false claims act; citation. K.S.A. 2011 Supp. 75-7501 through 75-7511, and amendments thereto, shall be known and may be cited. as the “Kansas false claims act.” History: L. 2009, ch. 103, § 1; Apr. 30. (Approved April 20, 2009)
Louisiana	Medical Assistance Programs Integrity Law. La. Rev. Stat. Ann. §§6:438.1 et seq. As amended through Acts 2016, No. 467, § 1. This Part may be cited as the “Medical Assistance Programs Integrity Law“. Acts 1997, No. 1373, §1. Acts 1997, No. 1373, §1; Acts 2009, No. 426, §1; Acts 2011, No. 185, §§1, 2.
Maryland	The Maryland False Health Care Claims Act of 2010 (That this Act shall take effect October 1, 2010). The Maryland False Claims Act of 2015. The Maryland False Claims Act, Md. Code Ann. Gen. Prov. § 8-101, et seq., which went into effect on June 1, 2015, is similar to its Federal counterpart, the Federal False Claims Act.
Massachusetts	Massachusetts False Claims Act, Mass. Gen. Laws ch. 12, §§ 5A through 5O. The MFCA was enacted in 2000 (Act of July 28, 2000, ch. 159, § 18, H.B. No. 5300. Appropriations-Fiscal Year 2001). 2012 MFCA Amendments. Those amendments increase incentives and broaden the circumstances in which individuals, including government employees, can bring MFCA claims.

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<b>State</b>	<b>State FCA</b>
Michigan	The Medicaid False Claims Act, Act 72, Eff. July 27, 1977, was amended by Add. 2005, Act 337, Imd. Eff. Jan. 3, 2006 ;– Am. 2008, Act 421, Imd. Eff. Jan. 6, 2009. The current act, Mich. Comp. Laws §§ 400.601—400.615, is designed to address Medicaid fraud.
Minnesota	Minnesota False Claims Act. Minn. Stat. §§ 15C.01 through 15C.16. Minnesota’s False Claims Act, which will take effect July 1, 2010
Mississippi	2013 Mississippi Code Title 43 - Public Welfare. Chapter 13 - Medical Assistance For The Aged; Medicaid. Article 5 - Medicaid Fraud Control Act. September 1, 2013
Missouri	L.1994, H.B. No. 1427, § A(§ 2), was amended by the Medicaid reform bill (§ 473.398 which is effective as of August 28, 2007). Missouri Health Care Payment Fraud and Abuse Act. L. 2012 H.B. 1608 (Passed on July 13 2012).
Montana	Montana False Claims Act. En. Sec. 1, Ch. 465, L. 2005. Hearing
Nebraska	Nebraska’s False Medicaid Claims Act was originally enacted in 1996 (Laws 1996, LB 1155, § 68.), and was amended by Laws 2004, LB 1084, § 5, and by Laws 2006, LB 1248, § 38
Nevada	Nevada False Claims Act. Nevada (1999). Senate Bill No. 418-Senators Titus, Wiener and Care. Approved May 18, 1999. After amendments that took effect July 1, 2007 were adopted, Nevada’s FCA conformed more closely to the federal statute. Amended again in 2013.
New Hampshire	New Hampshire Health Care FCA was introduced in 2004, Cp. 167:2, eff. Jan. 1, 2005. First enacted in 2004, the New Hampshire False Claims Act authorizes whistleblowers with knowledge of fraudulent efforts by persons or businesses to obtain state funds or to avoid an obligation to pay state funds to file suit on behalf of the state.
New Jersey	New Jersey False Claims Act. was signed into law on Jan 13, 2008, with an effective date of March 13, 2008

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State	State FCA
New Mexico	New Mexico Medicaid False Claims Act §§ 27-14-1 To 27-14-15, As Enacted By Laws 2004, Ch. 49 (Approved By The Governor March 3, 2004. Effective May 19, 2004.) And New Mexico Fraud Against Taxpayers Act §§ 44-9-1 to 44-9-14, as amended by Laws 2015, ch 128 (2015 amendments effective June 19, 2015)
New York	N.Y. Fin. Law §§ 187 through 194 The New York State False Claim’s Act was enacted in 2007. The New York False Claims Act was originally enacted on April 7, 2007 and was modeled after the Federal False Claims Act.
North Carolina	Medicaid False Claims Act was enacted in April 17, 1997 (Senate Bill 943), authorized Attorney General’s Office to pursue civil and criminal actions related to Medicaid fraud. The North Carolina False Claims Act in 2009, which became effective Jan. 1, 2010, authorized <i>qui tam</i> actions.
Oklahoma	Oklahoma Medicaid False Claims Act. Effective Nov. 1, 2007. The act was passed by the Oklahoma senate on May 8, 2007, and the house on April 25, 2007. The Act officially takes effect on November 1, 2007.
Oregon	2015 ORS 180.750 and 2009 ORS 180.755 after the effective date of this 2009 Act (January 1, 2010). [2009 c.292 §9]
Pennsylvania	
Rhode Island	Rhode Island False Claims Act. R.I. GEN. LAWS § 9-1.1. SECTION 9. This act shall become effective November 1, 2007.
Tennessee	Tennessee’s FCA Act. Tennessee has two False Claims Act Laws - the Tennessee False Claims Act (465 Tenn. Code Ann. §§4-18-101 et seq. 2012) and the Tennessee Medicaid False Claims Act (466 Tenn. Code Ann. §§71-5-181 et seq., came into existence in 1993). Tennessee lawmakers added a more general Tennessee False Claims Act in 2001 (Tennessee Acts 2001, ch. 367, § 1).
Texas	Texas Medicaid Fraud Prevention Law. Texas enacted the Medicaid Fraud Prevention Act in 1995 to establish a cause of action for false claims for payment from the Medicaid program (Tex. Hum. Res. Code §§ 36.001-132, added by Acts 1995, 74th Leg., ch. 824, Sec. 1, eff. Sept. 1, 1995).
Utah	Utah False Claims Act. was enacted by Chapter 126, Laws of Utah 1981, and amended by Laws of Utah 2007 (U.C.A. 1953 § 26-20-1. 26-20-9.5).

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State	State FCA
Vermont	Vermont False Claims Act. On May 18, 2015, the Governor of Vermont signed into law a state FCA that largely mirrors the federal FCA
Virginia	Virginia Fraud against Taxpayers Act. The Virginia Fraud Against Taxpayers Act1 (FATA) became effective on January 1, 2003
Washington	Medicaid Fraud False Claims Act. On March 30, 2012, Washington finally joined the 29 other states that have False Claims Act (FCA) by passing the Medicaid Fraud False Claims Act (MFFCA), the law will take effect on June 7, 2012
Wisconsin	2013 Chapter 20.931. 2007 Chapter 20 (October 26, 2007)
District of Columbia	2001 Ed., § 2-308.14. 1981 Ed., § 1-1188.14., effective May 8, 1998

*Source:* Freedom of Information Act requests submitted to the Office of the Inspector General and State legislative databases.

The coding for state-level FCAs was conducted in stages. To begin, we conducted individual searches of online state legislative databases to track the current set of effective state-level FCA provisions and the timeline of their amendments. We then searched secondary online sources from National Conference of State Legislatures, Taxpayers Against Fraud, and the Office of the Inspector General. We also submitted Freedom of Information Act requests to the Office of the Inspector General to reviews letters sent to State Attorney Generals, comparing the then-current state-level FCA to the federal standards. We also requested the archived versions of state FCA text from State Law Libraries, in the case of additional ambiguities. All of these records are available to the public.

## Variation in Signals of *Qui Tam* Plaintiff's Awards



Table A2: Effect of State-Level FCA Provisions, Controlling for Observed Award Amounts

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Y	DOJ cases			MFCU investigations			MFCU fraud cases			MFCU abuse cases		
Civil Penalty	-0.041 (0.050)	-0.040 (0.051)	-0.029 (0.051)									
Civil & Award Provisions	0.067 (0.047)	0.067 (0.047)	0.065 (0.047)									
Civil Penalty 12				-16.1*** (3.90)	-16.1*** (3.91)	-16.4*** (3.99)	-7.95* (3.80)	-7.94* (3.82)	-8.15* (3.73)	-7.47 (6.48)	-7.48 (6.51)	-7.47 (6.49)
Civil & Award Provisions 12				-4.44 (6.20)	-4.45 (6.22)	-4.73 (6.25)	-1.54 (4.29)	-1.51 (4.30)	-1.81 (4.32)	-2.09 (2.99)	-2.13 (2.98)	-2.09 (2.99)
FCA Awareness	0.63* (0.28)	0.64* (0.28)	0.61* (0.28)	-16.6 (14.9)	-16.5 (14.7)	-17.7 (15.2)	-17.0 (10.6)	-17.4 (10.6)	-18.0 (10.9)	1.08 (8.16)	1.48 (8.05)	1.09 (8.19)
\$MFCU/staff				0.0027 (0.069)	0.0028 (0.069)	0.00071 (0.069)	-0.0072 (0.052)	-0.0082 (0.053)	-0.0090 (0.052)	0.022 (0.039)	0.024 (0.039)	0.022 (0.038)
\$national awards, t-1		-0.025 (0.027)			-0.087 (0.95)			0.54 (0.73)			-0.64* (0.27)	
\$regional awards, t-1			0.0024 (0.0026)			0.11 (0.089)			0.10 (0.072)			-0.00064 (0.028)
Malpractices per 100,000 residents	0.0064 (0.015)	0.0069 (0.015)	0.0049 (0.014)	0.43 (1.69)	0.43 (1.70)	0.43 (1.63)	0.12 (1.60)	0.11 (1.60)	0.12 (1.54)	0.13 (0.36)	0.15 (0.36)	0.13 (0.37)
Log(Medicare population)	-0.017 (0.067)	-0.018 (0.068)	-0.019 (0.067)	27.8 (69.6)	27.6 (70.1)	21.7 (69.3)	58.8 (71.1)	60.0 (71.3)	53.1 (70.6)	-21.2 (26.8)	-22.6 (26.9)	-21.2 (27.0)
Log(Medicaid population)	0.040 (0.065)	0.040 (0.065)	0.044 (0.064)									
Dep. Variable Mean	0.23	0.23	0.23	34.27	34.27	34.27	27.22	27.22	27.22	7.23	7.23	7.23
Dep. Variable SE	0.47	0.47	0.47	36.87	36.87	36.87	31.82	31.82	31.82	13.13	13.13	13.13
Obs.	662	662	662	349	349	349	349	349	349	349	349	349
State FE	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

Note: (1) In Columns 1-3, the DV is the number of *qui tam* suit. In columns 4-6, total number of MFCU cases. In Columns 7-9, is the number of civil MFCU cases. In Columns 10-12, the DV is the number of MFCU criminal (abuse/neglect) cases. (2) Source: OIG - 2010 to 2016, DOJ - 2004 to 2016. (4) Search index is the average Google score for the three terms, scaled [0, 1].

## Outcome Scaling

In the analysis of *qui tam* plaintiff-initiated cases, we scale the number of cases by state population because this represents the number of potential *qui tam* plaintiffs and because the cases of fraud are not constrained to any individual health insurance program (for example, Tricare). However, if state population is correlated with FCA adoption, then this scaling would introduce measurement error. As an alternative, we scale the number of cases by other plausible denominators based on the institutional details of the FCA: such as Medicaid and Medicare enrollment since these are the primary defrauded healthcare programs.

For the MFCU case analysis, the number of investigations are scaled by the Medicaid population because the focus of the MFCUs is to monitor fraud within the Medicaid program. We find the results are stable when we alternatively scale by the state population (Table A3). Given the stability across these measures, we do not find evidence to suggest that the denominators bias the estimated effects of state-level FCA provisions.

Table A3: Effect of State-Level FCA Provisions, Adjusting the Denominator of the Dependent Variable

Y	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Denominator	Population	DOJ cases Medicare & Medicaid population	MFCU investigations Medicaid population	Population	MFCU fraud investigations Medicaid population	Population	MFCU abuse investigations Medicaid population	Population
Civil Penalty	-0.041 (0.050)	-0.076 (0.17)						
Civil & Award Provisions	0.067 (0.047)	0.21 (0.14)						
Civil Penalty 12			-16.1*** (3.90)	-4.50* (2.00)	-7.95* (3.80)	-1.55* (0.68)	-7.47 (6.48)	-2.82 (2.32)
Civil & Award Provisions 12			-4.44 (6.20)	-0.79 (1.31)	-1.54 (4.29)	-0.19 (0.94)	-2.09 (2.99)	-0.45 (0.59)
FCA Awareness	0.63* (0.28)	1.39* (0.62)	-16.6 (14.9)	-5.71 (3.93)	-17.0 (10.6)	-6.20* (2.85)	1.08 (8.16)	0.62 (2.10)
\$MFCU/staff			0.0027 (0.069)	-0.00011 (0.014)	-0.0072 (0.052)	-0.0022 (0.011)	0.022 (0.039)	0.0044 (0.0074)
Malpractices per 100,000 residents	0.0064 (0.015)	0.019 (0.033)	0.43 (1.69)	-0.31 (0.53)	0.12 (1.60)	-0.40 (0.52)	0.13 (0.36)	0.060 (0.091)
Log(Medicare population)	-0.017 (0.067)	0.21 (0.18)	27.8 (69.6)	2.18 (17.9)	58.8 (71.1)	7.07 (18.1)	-21.2 (26.8)	-3.12 (6.09)
Log(Medicaid population)	0.040 (0.065)	-0.13 (0.19)						
Dep. Variable Mean	0.23	0.64	34.27	7.37	27.22	5.73	7.23	1.67
Dep. Variable SE	0.47	1.32	36.87	9.27	31.82	7.78	13.13	3.44
Obs.	662	662	349	350	349	350	349	350
State FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) In Columns 1-2, the DV is the number of *qui tam* suit. In columns 3-4, total number of MFCU cases. In Columns 5-6, is the number of civil MFCU cases. In Columns 7-8, the DV is the number of MFCU criminal (abuse/neglect) cases. (2) Source: OIG, 2010 to 2016 and DOJ, 2004 to 2016. (4) Search index is the average Google score for the three terms, scaled [0, 1].

## Alternative Index Measures of Public Awareness

We find a significant and positive relationship between public awareness of FCAs and *qui tam* plaintiff-initiated actions (Table 3, Panel A). A 1 percentage point increase in the average Google index increases the number of *qui tam* cases by 3 percent, relative to the 0.23 average rate of cases per one million residents. The measure of awareness as an average may obscure which information seeking behavior (or search term) drives our results.

First, we test alternative ways to summarize the three search trends in a single measure of public awareness: the maximum search index value across the three terms “whistleblower”, “False Claims Act”, and “*qui tam*” (Table A3, Column 2) and the median search index value (Column 3) were utilized. The coefficient is of similar interpretation to the average value, but imprecisely estimated when inputting the maximum index value of the search terms. The effects of public awareness, measured as the median index value of the search terms, are similar to the marginal effects of the average index used in the primary analysis (0.69 versus 0.64, respectively,  $p < 0.01$ ).

Second, we include the search term index values as separate covariates. The significant effects of the average public awareness measure correspond to appear to be driven by the search index variation of the term “False Claims Act” (Table A3, Panel A, column 5) and “*qui tam*”(column 6), but not for “whistleblower” (column 4). Since the term “whistleblower” is used in previous studies of public awareness (Goel et al., 2010), we include it in the main results without loss of generality.

Table A4: Effects of State-level FCA Provisions on *Qui Tam* Plaintiff-initiated Healthcare Fraud Cases: Using Different Public Indices

	(1)	(2)	(3)	(4)	(5)	(6)
Civil Penalty	-0.041 (0.050)	-0.054 (0.051)	-0.045 (0.049)	-0.049 (0.052)	-0.057 (0.046)	-0.039 (0.053)
Civil & Award Provisions	0.067 (0.047)	0.080 (0.049)	0.065 (0.048)	0.079 (0.049)	0.065 (0.047)	0.068 (0.048)
FCA Awareness	0.63* (0.28)					
FCA Awareness (maximum)		0.13 (0.29)				
FCA Awareness (median)			0.59** (0.19)			
FCA Awareness (Whistleblower)				0.25 (0.35)		
FCA Awareness (FCA)					0.60** (0.20)	
FCA Awareness (Qui tam)						0.48* (0.22)
Log(Medicare population)	-0.017 (0.067)	-0.076 (0.11)	-0.036 (0.069)	-0.059 (0.095)	-0.024 (0.065)	-0.043 (0.076)
Log(Medicaid population)	0.040 (0.065)	0.11 (0.093)	0.041 (0.067)	0.093 (0.083)	0.040 (0.063)	0.056 (0.071)
Malpractices per 100,000 residents	0.0064 (0.015)	0.013 (0.012)	0.0070 (0.014)	0.013 (0.011)	0.0089 (0.013)	0.0041 (0.015)
Dep. Variable Mean	0.23	0.23	0.23	0.23	0.23	0.23
Dep. Variable SE	0.47	0.47	0.47	0.47	0.47	0.47
Obs.	662	662	662	662	662	662
State FE	No	No	No	No	No	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) The DV is the number of *qui tam* cases per one million state residents. (2) Whistleblower search, FCA search, and Qui tam search are Google scores, scaled [0, 1], for “whistleblower”, “false claims act”, and “qui tam”, respectively. Search index is the average Google score for the three terms. Maximum search index and median search index are the maximum value and median value across these three terms.

## Alternative Post-Period Specifications Among MFCU Cases

In the analysis of MFCU investigations, an additional concern is that results are sensitive to the post-period definition as one year after the implementation of state FCAs. Similarly, there may be concerns that the effects of provisions are short-lived and the estimates overstate these effects due to the chosen time period. We test this possibility by comparing the 12-month and 24-month effects in Table A5. After 12 months, award provisions increase *qui tam* actions by 38 percentage points (Column 1) while the effect of standard FCAs after 24 months in effect is a 36 percentage point increase (Column 2). Additionally, the estimated negative effect of civil penalty provisions on the total number of MFCU investigations is consistent across estimations using different codings of state FCAs (Columns 3 and 4).

Table A5: Effect of State-Level FCA Provisions on MFCU Cases Alternating Post-Period

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Y	DOJ cases		MFCU investigations		MFCU fraud cases		MFCU abuse cases	
Civil Penalty 12	-0.026 (0.060)							
Civil & Award Provisions 12	0.072 (0.048)							
Civil Penalty 24	-0.038 (0.062)		-16.7*** (3.70)		-12.2** (3.69)		-3.94 (5.10)	
Civil & Award Provisions 24	0.028 (0.048)		-3.58 (4.12)		-2.70 (3.69)		-0.19 (1.76)	
Civil Penalty			-19.1*** (2.65)		-1.14 (2.13)		-17.2*** (0.79)	
Civil & Award Provisions			-25.4* (9.55)		-15.0* (6.34)		-9.86+ (5.62)	
FCA Awareness	0.64* (0.27)	0.66* (0.28)	-26.8 (20.0)	-16.7 (14.4)	-23.5+ (13.8)	-18.8+ (10.7)	-3.10 (9.94)	2.61 (7.80)
\$MFCU/staff			0.012 (0.068)	-0.0039 (0.068)	-0.00065 (0.052)	-0.011 (0.053)	0.025 (0.038)	0.021 (0.039)
Malpractices per 100,000 residents	0.0063 (0.015)	0.0073 (0.015)	0.47 (1.70)	0.42 (1.68)	0.16 (1.62)	0.100 (1.56)	0.13 (0.35)	0.14 (0.38)
Log(Medicare population)	-0.014 (0.067)	-0.020 (0.067)	44.1 (68.1)	26.4 (70.2)	74.6 (71.5)	58.7 (68.9)	-20.2 (23.6)	-22.0 (27.9)
Log(Medicaid population)	0.038 (0.065)		0.048 (0.064)					
Dep. Variable Mean	0.23	0.23	34.27	34.27	27.22	27.22	7.23	7.23
Dep. Variable SE	0.47	0.47	36.87	36.87	31.82	31.82	13.13	13.13
Obs.	662	662	349	349	349	349	349	349
State FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) In Columns 1-2, the DV is the total number of MFCU cases. The DV is the number of civil MFCU cases (Columns 3-4), is the number of MFCU civil (fraud) cases in Columns 5-6, and is the number of MFCU criminal (abuse/neglect) cases in Columns 7-8. (2) Coefficients of Civil Penalty and Civil & Award Provisions present the marginal effects of state-level FCA provisions using the provisions' respective date of effectiveness. Coefficients of Civil Penalty and Civil & Award Provisions 12 present the marginal effects of state-level FCA provisions allowing a 12-month lag. Coefficients of Civil Penalty and Civil & Award Provisions 24 present the marginal effects of state-level FCA provisions allowing a 24-month lag.

# Measuring Propensity to Sue as Unemployment, rather than Malpractice Rate

Table A6: Effect of State-Level FCA Provisions, Controlling for unemployment rate

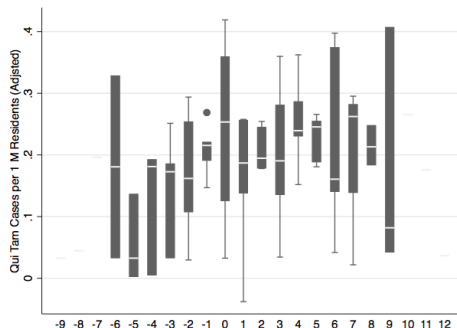
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Y	DOJ cases		MFCU investigations		MFCU fraud cases		MFCU abuse cases	
Civil Penalty	-0.041 (0.050)	-0.037 (0.048)						
Civil & Award Provisions	0.067 (0.047)	0.070 (0.048)						
Civil Penalty 12			-16.1*** (3.90)	-16.1*** (4.05)	-7.95* (3.80)	-7.73* (3.66)	-7.47 (6.48)	-7.58 (6.49)
Civil & Award Provisions 12			-4.44 (6.20)	-4.06 (6.32)	-1.54 (4.29)	-0.82 (4.31)	-2.09 (2.99)	-2.29 (2.92)
\$MFCU/staff			0.0027 (0.069)	0.0041 (0.070)	-0.0072 (0.052)	-0.0034 (0.054)	0.022 (0.039)	0.021 (0.038)
FCA Awareness	0.63* (0.28)	0.65** (0.25)	-16.6 (14.9)	-15.8 (14.8)	-17.0 (10.6)	-15.6 (10.4)	1.08 (8.16)	0.73 (8.32)
Log(Medicare population)	-0.017 (0.067)	-0.019 (0.071)	27.8 (69.6)	37.7 (73.8)	58.8 (71.1)	78.7 (68.1)	-21.2 (26.8)	-27.2 (25.5)
Log(Medicaid population)	0.040 (0.065)	0.044 (0.073)						
Malpractices per 100,000 residents	0.0064 (0.015)		0.43 (1.69)		0.12 (1.60)		0.13 (0.36)	
Log(unemployment)		-0.014 (0.097)		11.9 (15.8)		24.9* (11.0)		-7.71 (5.66)
Dep. Variable Mean	0.23	0.23	34.27	34.27	27.22	27.22	7.23	7.23
Dep. Variable SE	0.47	0.47	36.87	36.87	31.82	31.82	13.13	13.13
Obs.	662	662	349	349	349	349	349	349
State FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

+ p < 0.1, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001. Standard errors in parentheses.

*Note:* (1) The DV is the number of *qui tam* cases per one million state residents. (2) Malpractice is the number of malpractice suits in a state for minor damage, scaled by 100,000 state residents. The number of malpractice suits comes from the National Practitioner Data Bank Public Use Data file. (3) Unemployment is the average annual unemployment rate by state, from Bureau of Labor Statistics.

## Additional Figures of Key Measures

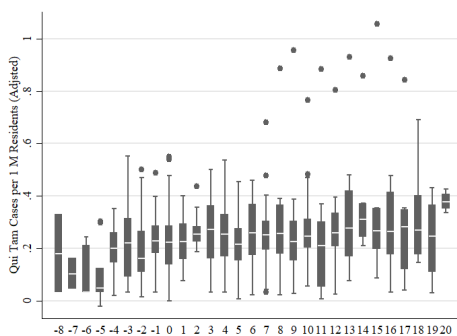
Figure A1: Distribution of Filed *Qui Tam* Cases Among States with Civil Penalty Provisions



*Note:* (1) Y-axis is the number *qui tam* suits/1M residents filed among the 6 states that had only a civil penalty provision at some point over the study period. *Qui tam* suits typically take more than a year to resolve, after filing suit; therefore, this is not measure of solved cases. (2) The number of cases are adjusted for public awareness (Google trend measure) and year fixed effects. (3) Each distribution corresponds to the relative year the civil penalty took effect (Y axis: 0). (4) Study period: 2004-2016.

*Source:* Freedom of Information Act request submitted to the Department of Justice.

Figure A2: Distribution of Filed *Qui Tam* Cases Among States with Civil Penalty, *Qui Tam*, and Award Provisions



*Note:* (1) Y-axis is the number *qui tam* suits/1M residents. States with a civil penalty, *qui tam*, and award provisions in our study period: AR, CA, CO, CT, DC, DE, FL, GA, HI, IA, IL, IN, LA, MA, MD, MI, MN, MT, NC, NH, NJ, NM, NV, NY, OK, RI, TN, TX, VA, VT, WA, and WI. *Qui tam* suits typically take more than a year to resolve, after filing suit; therefore, this is not measure of solved cases. (2) Notes (2)-(4) of Figure A1 apply.

*Source:* Freedom of Information Act request submitted to the Department of Justice.